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Railway Age

Two Sections—Section 1 & 2
January 11, 1918

SIXTY-THIRD QUARTO VOLUME

From July 1, 1917, to December 31, 1917

PUBLISHED EVERY FRIDAY AND DAILY EIGHT TIMES IN JUNE BY THE
SIMMONS-BOARDMAN PUBLISHING COMPANY

EDWARD A. SIMMONS, *President*,
L. B. SHEZMAN, *Vice-President*, HENRY LEE, *Vice-President & Treas.*
M. H. WIUM, *Secretary*,
WOOLWORTH BUILDING, NEW YORK.

CHICAGO: TRANSPORTATION BLDG. CLEVELAND: CITIZENS' BLDG.
WASHINGTON: HOME LIFE BLDG.

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(Established in April, 1856)

146802

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SIXTY-SECOND YEAR

1917

SECOND HALF

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Volume 63

July 6, 1917

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A few days ago an officer of a large railroad remarked that he was sitting back and letting other roads do the experimenting with a certain device, although he was closely interested in the results secured. While making this statement he admitted frankly that his position was open to criticism, but that he was following the practice of most other roads. He also admitted that if all other officers followed this same practice progress would cease. It is to the credit of American railway men that they have done as much pioneer work as they have in the development of methods, materials and devices. At the same time they have not gone as far as they might and progress has been retarded to that extent. It is not possible for every road to undertake experiments as elaborate as those conducted by the Pennsylvania Railroad at its locomotive testing plant at Altoona, but each road can do valuable work in some line. At present the need is particularly urgent for the development of methods leading to the conservation of labor and of materials such as fuel. While many of the ideas for appliances of this class originate with men in railway service they usually require much development and experimental work to make them successful. In the perfection of these devices the manufacturer is dependent on the co-operation of the roads for the opportunity to test the device out in actual service and for their sympathetic, constructive suggestions. Unfortunately it is here that the manufacturers frequently meet the spirit presented by the officer above quoted. In co-operating with the manufacturers a road must necessarily spend some time and money before the details of a device can be perfected and the device be made entirely practical. A railway may remain inactive and allow another road to assume this expense, knowing that it can share ultimately in the use of the device. However, such an attitude is unfair to the roads which are progressive enough to undertake work of this character, and if followed universally would stop further development. The greatest progress will only come when railway men take the broad attitude that time and money spent by them in developing one device will be returned to them through the benefit they receive from similar work on the part of other roads.

Developing New Appliances and Methods

Without missing sight of the fact for an instant that the railway companies themselves are the ones who must do the work of the educational campaign to get heavier carloading, nevertheless if the shippers and shippers' organizations were to fail to co-operate, it would be like putting the burden of a team of horses all on the nigh horse. It is especially encouraging, therefore, to have the Railway Business Association, which numbers among its members many of the very large shippers in the United States, come forward with a plan which, if adopted by all of its members, would be a long step toward furnishing the co-operation which is so necessary. The blanks which the Association asks its members to use in keeping records of carloading are shown elsewhere in this issue. In brief, the executives of the companies which are members of the association are asked to have a record made by individual cars of every carload shipment, the record showing car capacity or cubical capacity—when that is the limiting capacity; loading and reasons why full capacity was not obtained. It is safe to say that if such a system were adopted by almost any large company the improvement in loading would be a most substantial per cent. As it is now, there is little day by day check on carloading by employees of shipping companies. Occasionally there is an inspection made by the railroad or by some of the higher officers of the shipping company and for a time there is an improvement, but there is nothing systematic, nothing that will give assurance to an employee who carelessly loads a car to only a fraction of its capacity, that he will be caught and reprimanded. If, however, the blanks which the Railway Business Association has designed were used continuously and a responsible man was given authority to check these blanks every day and to report individual shipments which were inexcusably underloaded into cars, careless car loading by employees would be stopped to a great extent almost automatically. One thing more should be said about these blanks. They are a really constructive measure and therefore are in a rather different class than a simple circular or appeal to members of the association to get better

Railway Business Association Helps

carloading. Helpful as such appeals are, they do not hold forth a possibility of anywhere near as much actual improvement in conditions as does such a suggestion as this, which not only urges heavier carloading but gives a simple, feasible means by which better carloading can be obtained.

RAILWAY ADVERTISING

ADVERTISING has become one of the greatest constructive forces in American commerce and industry. An extremely interesting article on this general subject, of which Edward Mott Woolley is the author, appears in Scribner's Magazine for June. Mr. Woolley calls advertising "The Silent Voice," and he gives numerous specific examples of how by its use small and unprofitable concerns have been built up into big and highly profitable ones, and how other concerns by "public" policy advertising have changed popular hostility into its opposite.

The railways do not cut a very good figure in Mr. Woolley's article. He says: "Most people have no conception of the problems of the railroads and know little about the arguments from the railroad's standpoint. They are actuated chiefly by the conceptions they get from contact with trainmen and by reports of wrecks and claim suits. * * * Railroad advertising is in its infancy and the good-will publicity now being conducted is mostly of the eleventh hour variety. Railroad managers are just beginning to realize that they have long neglected to put their purposes before Congress and the people in that most logical of all publicity, paid advertising."

There is much truth in this. There has been a good deal of railway advertising which has been well handled and which has been effective in accomplishing its purposes. But its objects often have not been wisely chosen and, as Mr. Woolley shows, the aggregate amount of advertising which has been done by the railways is very small relatively to the investment they represent, the business they transact and the important part which they play in our national life.

The two most important kinds of advertising are that done directly to sell goods or services, and that done to give the public information and to secure its good will. The selling advertising of the railways has been directed almost entirely to the development and securing of passenger traffic. The amount of it they have done to develop and secure freight traffic has been negligible. They have engaged in "good will" advertising to a very limited extent. The most extensive campaign of that kind ever carried on in this country was conducted by them last year when they used advertising in over 17,000 newspapers to present to the public their side of their controversy with the railway brotherhoods. Some individual lines have done effective good-will advertising, but their number is few. Among those which are doing notable work along this line now are the New York Central, the Union Pacific, and, on a smaller scale, the Missouri, Kansas & Texas. The Pullman Company is carrying on an excellent campaign of this kind.

The most conclusive evidence in support of Mr. Woolley's statement that "railroad advertising is in its infancy" is afforded by statistics regarding the total amount spent for advertising in the country annually, and the part of this that is laid out by the railroads. Estimates of the total annual expenditure for advertising in the United States vary from \$375,000,000 to \$650,000,000. The railways represent about one-ninth of the national wealth, and yet their total expenditure for advertising in a year never has exceeded \$10,000,000. In 1913 the outlay of the Class I roads—those earning more than \$1,000,000 a year—was \$9,275,698. This is the largest figure ever reached, and yet it was only .44 of 1 per cent of total operating expenses. During the next three years railway expenditures for advertising declined, and in 1915 for Class I roads they were only \$7,141,908, or one-third of one per cent of total operating expenses. These

figures include the direct expense of printing advertising matter, folders, etc.; the outlay for space in newspapers, on billboards, and in show windows; the cost of distributing and posting such matter; the expense of any incidental plant or fixtures devoted to such use, as bulletin boards, racks, photographs, photographic outfits, etc.; and the salaries and office, personal and rental expenses of the advertising managers and their staffs.

Mr. Woolley estimates that the annual expenditure for the advertising of passenger automobiles amounts to \$25,000,000 and for motor trucks to \$2,500,000, or a total for motor-driven vehicles almost three times as great for all the railways. The manufacturer of a certain chewing gum and the manufacturer of a certain talking machine spend \$2,000,000 a year each. And yet there are people who talk about the railways "subsidizing" the press by large expenditures for advertising!

There are two ways of reaching the public through the press. One is through the reading columns; the other through the advertising columns. Publicity for a vast amount of railway information can be secured in the reading pages of newspapers and magazines, but only when it has the elements of timeliness and public interest, which make it to the direct interest of the journals themselves to publish it. Contrary to an opinion prevalent among railway men, there never has been and never will be any peculiar difficulty about getting information about railways published; but it must be what the editors want to publish at the particular time, not merely what the railways may think they ought to want to publish.

There are, however, many facts and fundamental principles regarding transportation which the railways want to familiarize the public with, but which editors generally, from their own point of view, have no special reason for wishing to publish. It is to familiarize the public with facts and principles of this kind that the railways ought to do much more "public policy" advertising than they ever have done. A good example of this kind of advertising is that which has been used by the American Telegraph & Telephone Company. This company found itself menaced a few years ago by a rapidly developing movement for government ownership. It has practically killed this by the use of intelligent advertising and publicity. A striking example of the kind of information it has disseminated through these channels is afforded by one of its recent advertisements entitled "20,000,000 Miles of Telephone Wire." This advertisement, which occupied a page in magazines throughout the country, shows that the Bell system has twice as many miles of telephone wire in the United States as there are in all Europe; that more than 500,000 new telephones are being added to it yearly—almost as many as the total number of telephones in England; that in twelve months the Bell system adds enough telephones to duplicate the entire systems of France, Italy and Switzerland combined; and that in proportion to population its extension in the United States is equal in two years to the "total telephone progress in Europe since the telephone was invented, a period of 40 years."

There are innumerable equally important and instructive facts about railways which ought to be told to the entire 100,000,000 people of this country, and which could be more effectively told by public policy advertising than by any other means. The total expenditure required would be relatively small; and even if as a whole the railways should increase their advertising expenditure 50 per cent it would then amount to but two-thirds of one per cent of their operating expenses. Of course, if the railways should conduct a public policy advertising campaign on a large scale they would be probably accused of subsidizing the press; but the good results obtained if the campaign was intelligently conducted would completely overshadow any bad effects which it might incidentally produce.

THE DECISION IN THE FIFTEEN PER CENT RATE CASE

THE *Railway Age Gazette* is disappointed but not surprised by the decision of the Interstate Commerce Commission in the 15 per cent rate case. This is the third time the carriers have appealed to the commission for general advances in freight rates. On all these occasions the main issue involved has been whether the controlling tendencies in the transportation field made it desirable from the standpoint of the public welfare for the railroads to be granted higher rates. On both previous occasions the commission showed want of comprehension of the situation, lack of foresight and disinclination or inability to predicate its findings on business principles. In its decisions in 1911 it based its findings largely on the good financial results of the fiscal year 1910 and hazarded the prediction that the results in 1911 would be better. But in all of the succeeding five years the carriers earned relatively less and in four of them very much less than in 1910. Again in 1914 the commission granted some increases but these were insufficient to be of any considerable value. The complete returns for the fiscal year 1914 show the smallest percentage of net return for 15 years. Then came the war, and six months later the commission granted some further small advances; but within a little more than a year from the time it rendered its first decision in the 5 per cent rate case there were more miles of railroad in receivers' hands than ever before and there had been made the lowest annual record of new construction in time of peace since 1848.

In other words, the commission went wrong in deciding the rate advance cases in 1911, and it went wrong again in deciding the rate advance cases in 1914. Therefore, this paper never was able to share in the optimism expressed in some quarters regarding the decision which it probably would render in the 15 per cent rate case. The commission up to this time usually has looked backward instead of forward. It has not correctly appraised the ruling tendencies in the railroad business or foreseen the results which the operation of those tendencies would produce. One of its fundamental troubles as at present constituted is that it has too many professors and lawyers on it and no business men at all. The business man who always looks backward soon becomes bankrupt. Foresight is the successful business man's qualification. The railway situation in the United States is what it is today mainly because for over ten years the earnings of the roads have been controlled chiefly by a regulating body whose members have not been able to tell what was going to happen in the railroad business until it had happened.

The opinion of the majority of the commission in the 15 per cent case lays much stress upon the fact that the gross and net earnings of the railways in both the fiscal and the calendar year 1916 were larger than ever before. It concedes that the present tendency of net operating income is downward, but it anticipates that it will be relatively larger in 1917 than in the years preceding 1916. It says that if the conditions should grow as bad as railway officers anticipate they may apply for further relief.

One of the first questions which all this raises is as to why the commission apparently thinks that if the net operating income of the railways to any extent exceeds that of the years prior to 1916 it will be sufficient. As everybody knows it was so insufficient during the years preceding 1916 that there was a steady and rapid decline in the development of railway facilities and the recent severe congestion of traffic and record breaking car shortage have been due to this. If it is desirable that the country should have sufficient transportation facilities; it necessarily follows that it is desirable that the net operating income of the carriers should be substantially larger than it was before 1916.

Another question which the opinion of the commission at once raises is as to why it believes that the net operating income of the carriers may be expected to be maintained on

the basis which it has been on since January 1. The fact is, that for about four years the railways have not spent enough for maintenance of way and maintenance of equipment. The commission says: "We have carefully considered the expenditures made by the carriers in 1916 for maintenance of way and structures and for maintenance of equipment. These indicate that no undue or disproportionate outlay was made in 1916 for these purposes."

The truth is that the expenditures for maintenance have been too small ever since 1913; that they were too small in both the fiscal and the calendar year 1916, and that this is one of the reasons why the net operating income shown in 1916 was so large. The great increases in prices of materials and equipment which have occurred are bound to affect net return much more in future than they have in the past if the railways can hire enough labor and buy enough materials and equipment properly to maintain their properties. If they do not do these things the properties will continue to be under-maintained. If they do these things there will be a very great increase in expenses and a sharp reduction under net operating income.

Suppose, however, that net operating income should be maintained not only on the present basis but should even be restored to the basis on which it was in 1916, would it be sufficient even then? One of the most vital needs of the country at the present time—a vital need which will continue to exist throughout the war and after it is ended—is for a large expansion of railway facilities. Now it requires twice as much earnings to add a locomotive or a car to railway equipment as it did two years ago. It costs 30 to 50 per cent more than it did then to provide almost any other additional facility that railways may require. All additional facilities must be provided either directly out of net operating income or out of new capital on which net operating income must be used to pay a return. It follows that if the railways are not to be allowed to earn relatively a larger percentage of net revenue than they were allowed to earn prior to 1916 they will be disabled from providing as large an amount of additional facilities as they did then, and the amount of new facilities provided for the last ten years has been utterly inadequate. The only member of the commission who apparently realizes that the prevailing tendencies of railway earnings and expenses prior to 1916 caused the slowing down of railway development and thereby made unavoidable the recent car shortage and congestion of traffic is Commissioner Harlan. Commissioner Meyer, apparently lost in a fog of academic theories, is blind to the fact that we are in the midst of a serious crisis in our transportation affairs and dissents even from the decision which grants the railways less than one-third of what they ask for. Commissioner McChord, who also dissents, makes the suggestion, which savors of politics, that instead of granting the railways increases in rates the government should regulate the prices which they have to pay for fuel and supplies. Commissioner Harlan, on the other hand, who concurs in the majority opinion in so far as it grants increases in rates, renders a separate opinion in which he contends the relief granted is not adequate. He goes to the heart of the matter when he says, "While the strains of the war have much to do with the present transportation conditions the one outstanding fact during the hearing as to which there was no disagreement was that our transportation system is lacking in the capacity to meet the demands of the shippers and that the resulting loss to the general public has been very large. This condition is one of present danger with a possibility that it may even become disastrous during the war period. But aside from this military influence the record leaves no doubt that our transportation system as a whole must be promptly enlarged and expanded."

His statement of the remedy is as explicit as his diagnosis. He adds:

"The record, in my judgment, demonstrates a proposition

that has long been clear to me, namely, that a rate is a public question, and that the existing rates, aside from any interest that the owners of our railways may have in the matter, could well be advanced in the public interest in order that assurance may thus be given for the early enlargement of our transportation facilities. So long as we look to private interests to furnish a transportation service for the country we must see to it that the rewards are sufficient to attract capital for its further development. Under present conditions this appears not to be the case."

This accurately sums up the situation. For almost ten years the railway managers have been telling the commission that they must have substantial advances in rates or they would be unable adequately to develop their facilities. The commission has declined to grant anywhere near as large advances as have been sought, and in consequence adequate facilities have not been provided. The commission has been conscientious in the course it has taken. It has meant to be fair. This is illustrated by the advance in interstate passenger and freight rates it had previously granted. It is illustrated by the fact that in the present case it has granted advances amounting to as much as all those asked for in both eastern and western territory three years ago. But the commission apparently does not appreciate how rapidly changes have been occurring. If it had granted three years ago the advances it has granted now the railway situation would be far better now and the present need for increases in rates would be far less acute. As the existing shortage of transportation facilities is due mainly to the past failures of the regulating authorities to understand current and foresee future developments, so it is to be feared that a serious aggravation of the present transportation situation will result from the Interstate Commerce Commission's failure to act courageously and vigorously in the present emergency. If this should be the case, the responsibility should be placed where it belongs.

BROWN'S DISCIPLINE; A PRIZE OFFER

THE abolition of suspensions is a reform in discipline which has made progress on American railroads during the past 30 years with rather slow and halting steps; but it is a real reform, in spite of doubts and lukewarmness and a good deal of neglect. The large success of the movement is indicated by the data, gathered from a hundred prominent roads, summarized in an article printed on another page of this issue. This subject, in its essential nature, is an elusive one, but for that very reason deserves study. On certain prominent roads the conviction that suspensions were undesirable, if not absolutely unjust, was fully settled twenty years ago, and long experience has confirmed that conviction. On other important roads the officers either denied this or treated the matter with indifference; and to make a broad survey of conditions has been difficult. On any large railroad system the mere collection of the facts concerning its discipline, the methods and the results, is a somewhat complicated problem; and this and other hindrances have left the whole matter so much obscured that a really satisfactory report on it is yet to be made.

This being the case, the *Railway Age Gazette* offers a prize of fifty dollars for the most readable and illuminating account of real, extended and instructive experience with the Brown system, the paper to reach the editor at New York before October 1 next. No conditions are attached to this offer; but there are some conditions in the nature of the case. As the desideratum is an account of experience it seems probable that the successful author must be a superintendent, or a trainmaster; an ex-superintendent or ex-trainmaster; or some other person who is or has been so close to the man actually managing the discipline that his (the manager's) acts, motives and spirit are thoroughly understood. Some one who has been intimate with a half dozen superintendents

may be best fitted for this kind of a task. Another condition is that the article must deal with a railroad of considerable size; for the officers who most want instruction in this matter are those whose divisions are too large for the chief executive to deal directly and in detail with all cases of discipline.

NEW BOOKS

The Story of the Pullman Car. By Joseph Husband. 161 pages, 56 illustrations, 5½ in. by 8 in. Bound in cloth. Published by A. C. McClurg & Co., Chicago. Price \$1.50.

This book contains a history of the sleeping car from its origin to the present day, giving particular attention to the life and work of the late George M. Pullman and the growth of the Pullman Company from an insignificant beginning to a great corporation. "The hotel desk," he says, "corresponds to the ticket office of the Pullman Company." The magnitude of Pullman service is indicated by its 260,000 beds and 2,950 office desks and its total registration of 26,000,000 people each year. He devotes separate chapters to the town of Pullman, Ill., where the Pullman cars are manufactured, to inventions and improvements which have added to the comforts and safety of passengers, to the manufacture of the cars and to the operating organization which makes Pullman service available in every part of the country.

Proceedings of the American Wood Preservers' Association. 538 pages, 6 in. by 9 in., illustrated. Bound in cloth. Published by the American Wood Preservers' Association, F. J. Angier, secretary-treasurer, Mt. Royal Station, Baltimore, Md. Price, cloth \$3.50; paper \$2.50.

This book comprises a complete account of the thirteenth annual convention of the American Wood Preservers' Association, which was held in New York on January 23 to 25 inclusive, 1917. As in previous editions it contains also statistics regarding the treating plants in operation, the quantity of wood treated and the preservatives used in the United States during the preceding year. A large part of the proceedings is devoted to statistics of service tests of cross-ties compiled by P. R. Hicks, engineer, Forest Products Laboratory, at Madison, Wis., and presented before the convention. Other subjects covered include plant operation, preservatives, the handling of wood, the grouping of ties for treatment, the purchase and preservation of timber, and service tests on wood blocks.

The Salton Sea. An account of Harriman's fight with the Colorado river. By George Kennan. Published by the Macmillan Company. 106 pages. Price \$1.

A rather exciting novel has been written based on the overflow of the Colorado river into the Imperial valley, Cal., and the fight which was made to save the valley by turning the river back into its own channel. The accurate account which Mr. Kennan now publishes of this episode in the history of the Southwest is as intensely interesting as any novel. The bed of the Colorado river, where it lies along the southwestern slope of the Imperial valley, is much higher than is the floor of the valley. The Imperial valley had been exploited by men entirely unconnected with the Southern Pacific who had built a large irrigation system and had colonized the valley. Water for irrigation was taken from the Colorado river. One of the irrigation ditches was so placed that floods in the Colorado ate back into it until the whole river flowed down through this widened ditch instead of in its own channel. In desperation the irrigation company appealed to Mr. Harriman personally. He lent the money on condition that Southern Pacific interests could see that the money was wisely spent. Before he got through with it Mr. Harriman had to advance more than three million dollars, which the government never reimbursed him for, although President Roosevelt had implied in a telegram that he would see that reimbursement was made. The book is so well written and the story it has to tell so dramatic that it ought to have a very wide circulation.

General Rate Advance Refused By Commission

Finds No Need for Heroic Treatment. Increases in Eastern Class Rates, Rail-and-Water Rates and on Coal

THE Interstate Commerce Commission on June 29 gave out its decision denying the general 15 per cent advance in freight rates asked by the railroads of the country, but permitting increases on coal, coke and ore, in class rates in Official Classification territory and in water and rail rates.

The order of the commission suspends until October 28 the tariffs and special supplements filed by the roads except those applying to bituminous coal, coke and iron ore in and between the eastern and southern districts. A separate order also suspends until October 29 proposed increases on anthracite coal.

As to the western and southern carriers, the commission expressed the conclusion that no condition of emergency exists which would justify permitting a general increase in their rates, but as to the eastern roads the commission found that they are entitled to increased revenue beyond that which they are securing and will secure from the increased rates on bituminous coal, coke and iron ore. It, therefore, announced that they would be permitted to increase class rates in Official Classification territory on not less than five days' notice, observing established relationships between ports and localities, based on the following scale between New York and Chicago:

Class	1	2	3	4	5	6
Proposed Rate	90	79	60	42	36	30
Present Rate	78.8	68.3	52.5	36.8	31.5	26.3

Carriers in the eastern, western and southern districts are given permission to increase joint rates between rail and water carriers to a level not higher than the all-rail rates and the western lines are allowed to file tariffs increasing rates on coal and coke not to exceed 15 cents per ton.

The commission says that the carriers were clearly within their rights in bringing the matter to its attention when they did and that "their action is an added evidence of the foresightedness and sense of responsibility in the performance of their duties toward the public with which so many of their officials are managing and administering the affairs of their respective properties," and that if there had been a continuation of the unfavorable results of February which were before the roads when the application was made, its conclusion must have been different, but that conditions have been improved since that time and that the record does not disclose the existence of a situation requiring so heroic a remedy as a large percentage increase.

Benefit is expressed that it would not be in the interests of any one now to resume hearings in detail as to the suspended tariffs and it is suggested that the carriers cancel them. Meanwhile, the commission promises to keep in close touch with the operating results for the future, and "if it shall develop that the fears which have prompted the carriers are realized or that their realization is imminent," that it will be ready to meet that situation by such modification or amplification of its conclusions and orders as are shown to be justified.

Commissioner Harlan filed a concurring opinion, but expressed the opinion that the relief granted is not adequate and that more general increases should have been allowed. Commissioner Meyer dissented from the conclusion that the eastern carriers require an increase in class rates. Commissioner McChord concurred in the dissent by Commissioner Meyer on the ground that the issue presented is largely one of governmental policy, and that the facts should be presented to Congress for determination as to whether prices for fuel and supplies should not be regulated rather than that rates should be increased. The following is an abstract of the opinion by the commission and of the other opinions. The statistical tables

referred to were not printed when the report was issued but are included in a separate supplement.

MAJORITY OPINION

On March 22, 1917, carriers in official classification territory, represented to the commission in a public conference that an emergency had arisen in their operation which required prompt remedial measures. Similar representations were made on March 27 by the carriers in western classification territory, and on April 10 by carriers in southern classification territory. In all of these conferences we were urged to act promptly, because, it was asserted, the situation had become critical and delay would detract from the beneficial effects of the remedial measures proposed.

The operating results for the month of February, 1917, may well have startled the railway executives because, generally speaking, they were, for the eastern district especially, extremely unfavorable. Severe weather, relatively heavy movement of empty cars, and increased wages, together with increases in the cost of materials and supplies, and to some extent of fuel, made the operating results of the eastern carriers for February alarmingly unfavorable. Under stress of these conditions the railway executives made their first appeals for relief in the emergency in which they believed they found themselves. If these unfavorable tendencies had continued and the operating results for the succeeding months had perpetuated tendencies of the month of February, a problem very different from that which now confronts us would have been presented. That carriers have been obliged to pay increased prices for materials and supplies can not be questioned. It is difficult to characterize with moderation the increases in the prices of metals as well as the prices which have been demanded in various localities for fuel.

The emergency which the carriers believed existed when these proceedings were initiated was attributed by some primarily to the war in Europe. While a number of witnesses referred to the burdens to the carriers of the war, viewing the record as a whole no such burdens have been shown to exist nor has the probability of their development been demonstrated. It was not shown that military transportation had been in the past, or is likely to be in the future, a financial burden to the carriers. On the contrary, certain facts were referred to which indicated that the transportation of troops had been more remunerative during certain mobilizations in the past than ordinary passenger transportation. In so far as anything that is here asked of us might contribute to the success of the war we should respond unhesitatingly to the fullest extent of our lawful authority. We are not unmindful of the fundamental and immensely valuable service which the carriers perform in times of peace and even more in times of war. No one will deny that the successful operation of the railways is vital to our national welfare. We fully appreciate the services which the railways are performing, and the unusual efforts they are making to secure a maximum of efficiency. But this record does not convince us that the suspending or refusing to suspend the proposed rates, or the granting or refusing to grant increased rates, will facilitate or retard the successful prosecution of the war.

An examination of the results of operation during 1916 shows that that year was as a whole more profitable for the carriers than any preceding year, and it may be assumed that they might suffer some abatement of the prosperity of that year without being crippled or in any way incapacitated. In the appendix are shown monthly averages per mile of

road for operating revenues and operating income for all class I roads in the United States and for those in the several districts. The relation of the figures for operating revenues for each calendar year to those for the first four months, January to April, inclusive, is seen to be rather remarkably uniform, enabling one to expect with considerable confidence that the operating revenues for the calendar year 1917 will be in excess of those of any preceding calendar year covered by the series of reports. An estimate of operating income for the year is also shown, but, owing to the fact that a considerable number of increased costs that may reasonably be expected had not become effective prior to April 30, this estimate is not entitled to so much confidence as that of operating revenues.

FAVORABLE PROSPECTS FOR 1917

A study of the figures suggests that, barring unforeseen contingencies and unusual disruptions of commercial affairs during the remainder of the year 1917, we shall find as results of the year's operations of class I roads figures about as follows:

	United States	Eastern district	Southern district	Western district
Average operating revenues per mile of road	\$17,104	\$29,432	\$13,610	\$12,597
Average operating income ¹ per mile of road	4,334	5,802	3,872	3,813

¹ Based on costs represented in accounts to April 30, 1917. Anticipated increased costs, if realized, will operate to reduce somewhat the estimated figures for operating income per mile.

The figures for operating income per mile of road for calendar years when compared with those for book value of investment in road and equipment per mile of road at June 30, give for class I carriers for the United States as a whole the following ratios, using the estimated figures for 1917:

	Per cent									
	1917.	1916.	1915.	1914.	1913.	1912.	1911.	1910.	1909.	1908.
Ratio of operating income to investment ¹	5.817	6.400	5.240	4.091	4.683	5.300	5.070	5.519	5.866	4.941

¹ Based on an estimate of \$4,334 operating income per mile of road and book investment of \$74,500 per mile of road. Increasing costs subsequent to April 30, 1917, will probably operate to diminish this figure somewhat.

The estimate of operating income for 1917 may be considerably diminished and still exceed the average for any three consecutive preceding years.

The consideration of a general increased rate case is necessarily a study of tendencies. The trend of the curves shown in the different diagrams for the respective periods of time is unmistakably in a certain direction. It will be observed that there have been numerous ups and downs, but the general tendency has been favorable, including, for the country as a whole, the first four months of 1917. These figures and diagrams do not suggest a country-wide emergency. Emergencies of greater or less intensity may have existed with respect to individual carriers during various limited periods, but the direction of the curves shows recovery in each instance before the lapse of extended periods of time. The general trend has been distinctly favorable.

MAJORITY OF ROADS IN HEALTHY CONDITION

An examination of the operating results of individual carriers shows that certain of them have lacked prosperity while others have been affluent. The reasons for lack of prosperity on the part of some of them are well known. The great majority of them show a healthy condition from financial and operating standpoints. We must consider not only the successful and strong but also the unsuccessful and the weak. The needs of certain weak lines, however, can not justify a course of action that is unwarranted by the condition of the larger number of strong and successful lines. This record shows that many of the carriers are in a most prosperous condition. They have been managed by men of conspicuous ability and integrity, in whose achievement the whole nation may well take pride. It is certainly desirable

that successes of this character which mean efficient service shall continue.

All the carriers expressed their willingness to begin immediately upon a revision of the horizontally increased rates with a view to re-establishing existing relationships between competitive localities, commodities, and territories, thus recognizing the commercial disturbances which would certainly follow the proposed increases. It was generally admitted that a percentage increase would destroy existing rate relations, and in all cases where the amount of the charge is appreciably large and where the differences in distance between competitive localities are relatively great a 15 per cent increase would seriously affect competitors in a common market. It is probably due to this fact that with respect to certain important commodities the protests came from persons located at the greater distances from the markets.

Only a most urgent and extraordinary situation would justify permitting tariffs carrying a large percentage increase to become effective. This record does not disclose the existence of a situation requiring so heroic a remedy.

The absence of protests against the proposed rates from many interests and localities affected received some attention upon the record. The relative absence of protests from certain large traffic areas was likewise brought to our attention. These facts are not without significance in so far as they indicate an existing state of the public mind. They are quite without significance as a basis for determining the propriety and reasonableness of the proposed rates. The statute does not authorize us to arrive at a decision with respect to the reasonableness of rates on the basis of preponderating views. It may be admitted that facts of this character reflected in the record indicate a somewhat different state of public opinion from that which has heretofore prevailed in connection with similar issues before us. Representatives of insurance companies and bankers appeared to favor permitting the rates to become effective as a means of stabilizing their investments in railroad securities and stocks.

As we have said, if the unfavorable results of February had continued our conclusion must have been different. Those unfavorable tendencies, however, did not continue. The general operating results, looked at in the large through a series of years, show on the whole substantial improvement, general prosperity, and, by comparison with former years, ample financial resources with which to conduct transportation.

Increased prices of materials and supplies, the increased cost of fuel, and increased wages are all significant and extremely important factors in the situation which we are here considering. Some of the symptoms are unquestionably unfavorable. Much or all of what some of the railway officials believe will occur may occur in the future. No one can know in advance. Higher prices are being paid today, and still higher prices may have to be paid in the future, but that these higher prices will have that unfavorable effect on the general operating results which some believe they will have is by no means certain.

RECENT TENDENCY OF REVENUES

The carriers in the eastern district down through September, 1916, showed an increase in net revenue and in operating income over the corresponding month of the previous year. Beginning, however, with October, 1916, and continuing through April, 1917, this tendency is reversed for the eastern carriers, whereas with few exceptions the southern and western carriers continued to show comparative increases in these items for each successive month. Thus, in October, 1916, the eastern carriers showed a decline in net revenue per mile of road from \$840 to \$821, and in operating income from \$760 to \$726. For November, 1916, the eastern carriers showed a decline in these two items from \$800 to \$720 in net revenue, and from \$721 to \$623 in operating income.

For December, 1916, the same tendency persisted, showing a decline in net revenue from \$706 to \$630 and a decline in operating income from \$625 to \$532.

The increasing tendency in these items for the months of July, August and September, 1916, sufficed for the last six months of the calendar year 1916 to make a slightly better aggregate showing as contrasted with the last six months of the previous calendar year. But so far as the eastern carriers are concerned, the decline for the last quarter of 1916 was continued for the first four months of 1917 and in increasing ratio.

Thus, in January, 1917, net revenue per mile of road operated declined from \$608 to \$531, and operating income from \$520 to 434.

For February, 1917, exceptional operating conditions exaggerated the decline and rendered it more pronounced. The February returns show a decline in net revenue from \$576 to \$271, and in operating income from \$489 to \$176.

March showed the same comparative decline, although upon a less intensified scale than in February. Net revenue declined from \$666 to \$557, and operating income from \$578 to 460. The returns for April indicated the same tendency, net revenue declining from \$686 to \$611, and operating income from \$599 to \$512.

Summarizing the four months ended with April, 1917, the decline in net revenue per mile of road was from \$2,536 to \$1,970, and in operating income from \$2,185 to \$1,581. If we compare the relative decline in the last quarter of 1916 when this tendency became noticeable, we find that the falling off in operating income from the operating income of the last quarter of the previous year was approximately 19 per cent, whereas for the first four months of the current calendar year the decline in operating income as compared with the first four months of the previous calendar year amounts to about 27.5 per cent.

In interpreting these figures it must be borne in mind that the gross revenue in each of the three districts showed for each month from July, 1916, to April, 1917, a comparative increase, except only for the month of February in the eastern district. In the southern and western districts the results, so far as net revenue and operating income are concerned, show an almost unbroken contrast to the results for the eastern district.

If on the basis of the first four months of the current calendar year we estimate the total gross revenue in the eastern district for the entire year, we find indicated an average operating revenue per mile of road of \$29,432, as against an average operating revenue for the preceding year of \$27,688. Despite this increase in the gross operating revenue the average operating income per mile of road estimated for 1917, on the basis on the first four months of the calendar year, amounts to but \$1,582, as against \$2,188 for 1916. This indicates that the ratio of operating income to average investment in the eastern district will be but 4.893 per cent, as against 6.662 per cent for 1916.

In other words, using the actual figures for the first four months of the present calendar year, it would appear that although the gross revenue for the carriers in the eastern district would exceed that for the calendar year 1916 by approximately 7 per cent the operating income per mile of road will be but \$5,802, as against \$7,782 in 1916. This is only 75 per cent as much net income per mile of road in 1917 for performing about 107 per cent of the service performed in 1916.

The returns for the first four months of the calendar year 1917 for the roads in the southern district and in the western district disclose a different tendency and outlook. Common alike to the three districts is the probable increase in gross operating revenues. Thus, the first four months disclose average operating revenues per mile of \$4,388 in the southern district as against \$3,960 for the corresponding period

in 1916, and \$3,705 as against \$3,288 in the western district. But in both the southern and western districts the first four months of the current calendar year presage not only an increase in the average operating income per mile of road, \$1,222 as against \$1,181 for the first four months of 1916 in the southern district and \$930 as against \$877 for the roads in the western district, but in both an increase in the ratio of operating income to average investment is indicated, rising in the case of the southern district from 6.390 per cent to 6.453 per cent and in the western district from 5.953 per cent to 6.217 per cent.

It may very pertinently be asked how it results that with the carriers in all three districts confronting increased expenditure for labor, fuel and supplies, the prospective effect upon their respective net income is so markedly different. To this inquiry it is probably too early to make a completely satisfactory answer. Among the factors the following may be suggested as highly probable contributory causes. The ratio of increased wages may have been greater for the eastern carriers. The eastern carriers have encountered earlier and to a more complete degree the increase in prices of materials and supplies. The volume of traffic which has congested certain of the roads and terminals in the eastern district would seem to indicate that with their present facilities they can perhaps take on additional traffic only at an increasing cost per unit. In this respect they present a somewhat sharp contrast to roads in the southern and western districts. Congestion at eastern ports and terminals has led to the diversion of some traffic to Gulf and south Atlantic ports.

In the western district the transcontinental roads, particularly the Southern Pacific and the Santa Fe, are now carrying a large volume of traffic which would normally move via the Panama Canal. This they are apparently able to handle without great difficulty. Whatever may be the other contributing causes to the divergent tendencies manifested in the three districts, the existence of agencies making for radically diverse results in the eastern district from those likely to appear in the southern and western districts would seem to be substantiated by the following table, which gives the ratio of net operating income to property investment in the three districts from 1900, with the probable results indicated for 1917.

NET OPERATING INCOME PER CENT OF PROPERTY INVESTMENT

Fiscal years ending June 30 —	Eastern district.	Southern district.	Western district.
1900.....	5.27	....	....
1901.....	5.49	4.46	4.84
1902.....	5.69	4.77	5.29
1903.....	5.77	5.01	5.30
1904.....	5.44	4.87	5.03
1905.....	5.70	5.15	5.25
1906.....	6.21	5.26	5.90
1907.....	6.14	4.67	6.19
1908.....	5.14	3.87	4.87
1909.....	5.43	4.72	5.34
1910.....	6.16	5.19	5.06
1911.....	5.13	6.22	4.68
1912.....	5.10	4.40	4.24
1913.....	5.28	4.55	4.91
1914.....	3.95	4.25	4.23
1915.....	4.42	3.41	4.14
1916.....	6.64	5.26	5.43
1916.....	1 6.42	5.27	5.29
1917 (estimated).....	2 6.61	....	5.45
1917 (estimated).....	4.89	6.45	6.21

¹ Average based on gross property investment.

² Average based on property investment less reserves for depreciation.

Without in any wise impugning the estimates of the carriers or criticisms thereof offered by the protestants, we prefer to confine our forecast to the basis of actual experience for the 10 months from July 1, 1916, including the first four months of the present calendar year.

RATES THAT MAY BE ADVANCED

For these reasons, necessarily stated in somewhat general terms, we are led to the conclusion that no condition of emergency exists as to the western and southern carriers which would justify permitting a general increase in their

rates to become effective. In the eastern district increased rates have recently been permitted to become effective generally on bituminous coal, coke and iron ore. We think that similar increases may properly be permitted in the southern district on coal, coke and iron ore, and in the western district on coal and coke. This will preserve rate relationships between the several districts. In the southern district the proposed increased rates on coal are on the basis of 15 per cent, with a maximum of 15 cents per ton. These tariffs we shall permit to become effective. In the western district the increases are based upon 15 per cent, with a minimum of 15 cents per ton. These tariffs will be suspended, but the western carriers may, if they so elect, file new tariffs carrying increases in rates on coal and coke not exceeding in any case 15 cents per ton. All of the tariffs included in this proceeding of the western lines will be suspended. All of the tariffs included in this proceeding of the southern carriers will be suspended, excepting those applying on coal, coke and iron ore.

EASTERN ROADS NEED MORE REVENUE

For reasons indicated in this report, we shall suspend all of the tariffs before us in this proceeding of the eastern carriers, excepting those applying on iron ore. As has been indicated, however, the conditions confronting the eastern carriers are substantially different from those confronting the southern and western carriers, and we are persuaded that they are entitled to increased revenue beyond and above that which they are securing and will secure from the increased rates on bituminous coal, coke and iron ore. By recent act of Congress we have been given jurisdiction over the movement, distribution, exchange, interchange and return of freight cars. The obvious intent of this legislation is that cars shall be so used by the carriers as to secure the performance of the largest possible amount of transportation in needed and equitable ways. Shortly following the outbreak of the European war an unprecedentedly heavy movement of freight to the eastern district began, and that district in large part has been badly congested ever since. Hopeless congestion has been avoided only by practically continuous condition of operating under embargoes. The result has been that while roads in other sections have generally been short of cars and in possession of less cars than they owned, the carriers in the eastern district have been in possession of substantially more than their ownership of cars. The hauling of empty cars is expensive and productive of no revenue. Railroad operating officials naturally and properly endeavor to avoid all unnecessary hauling of empties. There has been reason to believe that this disinclination to haul empties has caused the detention on the eastern roads of many cars that were badly needed in the west or south. It is probable, if not certain, that in administering the duties laid upon us by the legislation referred to we shall find occasion to require a very unusual haul of empty cars by the eastern carriers for the purpose of getting them promptly to western or southern localities where they are needed. In this way important additional expenses will probably fall upon the eastern carriers.

As we have indicated, percentage increases, especially where the percentage is substantial, can not fail to disrupt competitive commercial relationship. A general increase in class rates, which preserves existing relationships, distributes itself more generally and more equitably than would general increases on commodity rates. It also affords relatively equal benefits to all of the carriers parties thereto. Among the eastern carriers those located in New England appear to present the most serious condition. They are not carriers of large volumes of heavy loading commodities that move under commodity rates. It is not possible to estimate with confidence and accuracy the amount of additional revenue that will accrue from increased class rates, but from the

best information at hand we conclude that the eastern carriers should be permitted to increase their class rates between New York and Chicago to the following scale, and to correspondingly increase their other class rates applying intra-territorially between points in official classification territory, observing the established relationships between ports and localities:

1	2	3	4	5	6
90	79	60	42	36	30

Such tariffs may be made effective upon not less than five days' notice, given in the usual way.

Special emphasis has been laid upon the unusually heavy increased expenses that have been laid upon the carriers by water, which, because of arrangements for through carriage with rail carriers, are subject, as to part or all of their rates, to our jurisdiction. Ordinarily rates via rail-and-water routes are maintained at a lower level than via all-rail routes.

Largely increased costs of operation, the diversion of traffic to other channels because of war conditions, and the attendant increased marine insurance have laid upon such rail-and-water routes unusual burdens. We think that existing conditions justify the maintenance of rates via such routes on a level not higher than the all-rail rates between the same points. Carriers in the eastern, southern, and western districts parties thereto may, if they so elect, file and make effective, upon not less than five days' notice, tariffs increasing existing joint rates between rail-and-water carriers to a level not higher than the all-rail rates between the same points.

CARRIERS WITHIN THEIR RIGHTS

The carriers were clearly within their rights in bringing these matters to our attention when they did. We do not question their good faith in anything they have done in this connection. Their action is an added evidence of the far-sightedness and sense of responsibility in the performance of their duties toward the public with which so many of their officials are managing and administering the affairs of their respective properties. The things which they believed several months ago would happen have not happened. None of us know what the future may develop. We do not believe that it would be in the interests of anyone to now resume hearings in detail as to the suspended tariffs. As stated, we believe that the facts which have been developed constitute a full and sufficient basis for arriving at a just conclusion with respect to the proposed increased rates. We shall, through the medium of the monthly reports of the carriers, keep in close touch with the operating results for the future, and if it shall develop that the fears which have prompted the carriers are realized or that their realization is imminent, we shall be ready to meet that situation by such modification or amplification of the conclusions and orders herein reached and entered as are shown to be justified. If it shall develop that what has been accorded herein is more than is appropriate or that the increased rates are no longer warranted, we shall depend upon the pledges of the carriers to respond promptly to an announcement by us of a conclusion to that effect. Inasmuch as a general percentage increase is so undesirable because of its serious effect upon commercial conditions and established relationships, it would seem to be appropriate for the carriers to cancel the tariffs which we suspend herein, and permission is hereby accorded them so to do. The record will be available for consideration in any further proceedings that may be necessary or appropriate in this connection in the future, and any substantially changed conditions which may develop can be promptly, adequately, and fairly dealt with. The foundation for any such action can doubtless best be laid in conferences between the commission and representatives of the carriers and of the shippers. The existing public sentiment to

which we have referred and the manner in which, the proposals of the carriers have been presented and handled by them indicate a feeling of mutual confidence, which at many times in the past has been regrettably absent.

COMMISSIONER HARLAN'S OPINION

Under the law, this commission may act only upon a concurring vote of at least four of its members, and in view of the recent death of Commissioner Clements and of the varying conclusions entertained among my colleagues on the important questions presented by the record, it became necessary, in order that some affirmative results might follow from this extended and laborious investigation, that I should concur in the course outlined in the commission's report. I did this, however, because its findings are in the direction of what the record seems to me to justify and require and not because I regard the relief granted as adequate.

From the mass of statistics offered in evidence on both sides it is not difficult, as the commission's report indicates, to compile figures to illustrate almost any theory respecting the troubles of the carriers of the country. Laying some stress upon the figures for the last four months, the commission's finding upon the whole record is that the fears of the railroad officials, when they laid their request for increased rates before us, have not been realized. The report, then, indicates the purpose of the commission to follow the developments through the medium of the monthly reports of the carriers, and should their earnings make it appear that the dangers feared by the carriers are imminent, the commission will then meet the situation by promptly amplifying the limited relief now permitted to them.

MONTH-TO-MONTH VIEW INADEQUATE

This month-to-month and purely statistical view of the matter seems to me to be wholly inadequate. Nor do I regard that course as altogether safe. We are facing a much larger problem, and it must be approached in a much broader way if we are to reach a sound solution. The report of the commission states that some of the symptoms disclosed of record are unquestionably unfavorable. As I read the record, that is undoubtedly the case and, being so, the wisdom of deferring full relief is not apparent to me. What the country as a whole needs, as all participating in the hearings seemed to agree, is much larger terminals, more tracks, more cars, and more locomotives. This enlargement of our facilities is not required merely to meet the exigencies growing out of the war, but to keep our transportation facilities up to the measure of the country's growing volume of business. We are now a creditor nation, and it may reasonably be expected that the trade balance in our favor will continue at least for some years. With the aid of our new merchant marine, this may become a more or less permanent condition. With such a prospect before us, a foundation should be laid without delay for a definite plan for the development and building up of our transportation system. For seven or eight years, competent railroad officials have been warning us that the carriers are not keeping abreast of the requirements of the country. It is true that there are periods when a substantial part of the carriers' equipment is lying idle. On the other hand, the carriers can not prudently undertake to meet extreme and extraordinary demands. But a rough estimate of a billion dollars has been suggested as the yearly expenditure necessary to enable them to open up new territory and to enlarge and extend their present facilities in order to meet the rapidly growing volume of the general commerce of the country. No such investment, however, has been or is being made in our railroads. On the contrary an exhibit of record shows that beginning with 1895 the new construction increased year by year until 1910, while from the latter date it has steadily diminished. In other words, our population and commerce have largely expanded, but

there has been no expansion, relatively speaking, in our transportation facilities.

INDUSTRIES HAVE BEEN EMBARRASSED

For two years the commerce of the country has been moving under intermittent embargoes, an experience, as must be observed, that we have had in the past not only while we were at peace, but while the world at large was also at peace. Great losses have resulted to the whole country. The producer and manufacturer, with ample supplies which the public was demanding, have been unable to make deliveries. The coal operator, with no shortage of coal at the mine, has not been able to deliver it promptly to those needing it. Prices for the necessities of life have increased, partly at least because existing supplies could not be brought to the consumer; and the speculator has been enabled to demand unreasonable prices because inadequate facilities have prevented the competition in the consuming markets of those who were prepared to furnish the same commodities at lower prices. Large industries have been greatly embarrassed. It will suffice to say that, while the strains of the war have much to do with the present transportation conditions, the one outstanding fact during the hearing, as to which there was no disagreement, was that our transportation system is lacking in the capacity to meet the demands of the shippers and that the resulting loss to the general public has been very large. This condition is one of present danger, with a possibility that it may even become disastrous during the war period. But aside from this military influence, the record leaves no doubt that our transportation system, as a whole, must be promptly enlarged and expanded.

RATE ADVANCE IN PUBLIC INTEREST

The shippers of the country recognize the danger and have given expression to this apprehension upon the record. They regard a prompt and sound cure of the trouble as being as vital to them as to the carriers. Representatives of some of the largest industrial centers, officers of some of the largest traffic organizations, and officials of some of the most important shippers of the country, availed themselves at the hearing of the opportunity to refer to the situation, and to point out that in their own interest as shippers, and in the interest of the general shipping public, the rates of the carriers might well be increased in order that they may be put in a position to increase their terminals and facilities. Many earnest objections were of course made to any increase. Other shipping interests were ready to acquiesce in an increase provided no discriminations against them were involved. But the whole discussion, unusually free from selfish contentions on the part of the shippers, and approached by the carriers, as I understand the record, in no selfish spirit, leaves me with the conviction that the shippers at large are ready for a substantial increase in their rates, provided it will result in an early betterment of their transportation service and in a rate structure free from discriminations. The record in my judgment demonstrates a proposition that has long been clear to me, namely, that a rate is a public question and that the existing rates, aside from any interest that the owners of our railroads may have in the matter, could well be advanced in the public interest, in order that assurance may thus be given for the early enlargement of our transportation facilities.

I express the thought in that way because it is clear that so long as we look to private interests to furnish a transportation service for the country we must see to it that the rewards are sufficient to attract capital for its further development. Under present conditions this appears not to be the case. Executives of great insurance companies and of great savings institutions testified during the hearings that the volume of their holdings in railroad securities has been steadily diminishing and that they and other large investors

are looking with decreasing favor on railroad securities. Possibly this may result to some extent from an impression, which I think is very erroneous, that this commission takes too narrow a view of such questions as are before us here. But, in any event, we must not overlook the fact that at this time, and apparently for the next few years, new capital must be sought by the carriers in competition with the demands of many governments for war loans and in competition with the very large returns of industrial companies. Nor must we overlook the fact that the returns on property investment in railroads, even under the unusually prosperous year 1916, were not such as to give any preference to the railway investor, and for the last 16 years this average return has been, using the principal and representative roads, for the eastern district 5.48, the southern 4.69, and the western 5.04 per cent.

From the whole record it is clear to me that the 15 per cent increase proposed by the eastern carriers which in its actual results would probably not exceed 10 per cent should be permitted to become effective. The record shows that conditions with the western and southern lines are somewhat better than with the eastern carriers. Nevertheless, in my judgment, they also should be permitted some increase in their rates on the general grounds that I have attempted briefly to outline. In view, however, of the findings of the commission's report, it will not be necessary to discuss the extent of the increase that they should have.

In the light of the refusal by the commission of what, in my judgment, is sufficient additional revenues to the carriers, it seems appropriate again to call attention to the economies that may be and should be effected through the co-ordination of terminals, the elimination of unhealthy competition, the waste in service through the light loading of cars, and the performance of special services for particular shippers without charge. Much of the service at the larger industrial centers and ports is special in character and the heavy terminal cost encountered by the carriers in performing them is spread over the rate structure instead of being compensated under a special charge. The smaller communities grouped with the larger centers thus bear burdens that should be borne by others. Sooner or later matters of this kind must have serious attention by the commission, and they will open sources of substantial additional revenues to the carriers.

COMMISSIONER MEYER'S OPINION

Meyer, Commissioner, dissenting in part:

I concur in the conclusions with respect to carriers in western and southern territories. I dissent from the conclusion of the majority that an emergency exists in regard to carriers in the eastern district of such a character as to make it imperative to authorize at this time the increased class rates sanctioned by the majority.

I recognize freely that the results of operation for eastern carriers during recent months have been less favorable than for the western and the southern. Certain tendencies are unmistakably unfavorable. It is difficult to characterize with moderation many of the prices of materials and supplies and fuel which these carriers have paid and which apparently they will pay for some time to come. These together with higher wages tend with certainty toward more unfavorable operating results. We have authorized increases in the rates on bituminous coal, coke and ore which will add to the operating incomes of these carriers many millions of dollars and which will bring the estimated return on the book cost of the carriers up to a level which in my judgment disproves the theory of an acute contemporary emergency demanding drastic action at this moment. In spite of increased and increasing expenses, there is nothing before us to prove conclusively that the net returns of carriers in the eastern district for the calendar year 1917 may not be more

favorable than the net returns for all but a very small number of years during their entire history. But even if the contrary could be demonstrated, it does not necessarily follow that the increases authorized by the majority should be authorized at this time. Whenever the time may come, if it should come, that a real emergency can be shown to exist, we can then do promptly what justice and the law may demand. Before important action like this is taken the most conclusive proof of its necessity should be before the commission. If I apply to the facts now before us the same test which I applied to the facts before the commission in the great advanced rate cases that have preceded this one I am forced to a different conclusion regarding eastern carriers than that reached by the majority. In this connection I refer to Tables 13 to 21, which reflect operating results through the entire period embracing all of the important increased rate proceedings. They are the tables used in our reports of July, 1914, and December, 1914, brought down to date. I direct especial attention to Tables 13, 14, 15 and 16, which clearly indicate the improvement in operating results following December, 1914, and likewise reflecting the decline since the fall of 1916.

In the instant case we have before us once more the now familiar aggregation of basic factors. Again we have considered them by themselves and in their relationship to one another, and we have assessed them in the light of the attendant facts and circumstances of record. Applying the same kind of reasoning and the same methods which have prevailed in the earlier proceedings to the facts upon the present record, I have reached the conclusion that the proposed increased rates have not been justified. The majority holds that the eastern carriers have justified certain increased rates. My convictions are to the contrary.

The year 1916 is admitted by all to have been an abnormally prosperous year for the class I railways of the eastern district, as well as for those of the entire country. The banner year prior to 1916 was 1913. In 1913 the operating revenues in the eastern district amounted, for the four months January to April, inclusive, to \$7,241 per mile of road; the next best year prior to 1916 was 1915, in the corresponding four months of which this item was \$6,653, although for these four months it was surpassed by 1914, in which the item amounted to \$6,850. For the like period of 1916 the item had risen to \$8,528, an increase of 17 per cent over 1913, and for the like period of 1917 it had further risen to \$9,056, an increase of more than 6 per cent over the figure for 1916.

It is argued, however, that expenses are rising much faster than revenues and that the outlook is so unfavorable that in the opinion of the majority it is necessary at once to authorize an increased class scale of rates.

The carriers are primarily interested not in operating revenues nor in operating expenses, but in the margin between them, in what remains of operating revenues after operating expenses and taxes have been deducted, or operating income. The operating income per mile of road in the eastern district for the first four months of 1916 was far in advance of that of any prior year for which the figures have been compiled from our monthly reports, being \$2,188 as against \$1,394 for the like period of 1911. The largest figure for this period for any of the intermediate years was \$1,340 for 1913. The corresponding figure for the like period of 1917, within which the flood of increasing costs was expected to be upon us, was \$1,582, an amount more than 13 per cent better than for that period of any of the preceding six years except the abnormal year of 1916.

It is too early for most of the May reports of the large carriers to have reached us, and at the time of writing only two of the principal carriers have filed their reports for May. While it probably would be incorrect to say that these two are typical, it is not without significance to point out

that the operating income of the Southern Pacific Company for May, 1917, is more than 30 per cent greater than for May, 1916, and that while that of the Delaware, Lackawanna & Western, the only large eastern carrier whose last monthly report has been received, shows a falling off, it is yet substantially greater than for any May in the four years preceding 1916.

In our reports relating to advanced rate cases which have preceded this one more or less has been said about operating ratios. I fully appreciate the limitations inherent in the use of operating ratios. However, they have been among the more prominent factors which appear upon the respective records and in our reports. The table below states the operating ratios for all class I carriers in the eastern district for the first four months of each of the last 10 years:

TABLE OF OPERATING RATIOS FOR CLASS I STEAM RAILWAYS,
EASTERN DISTRICT

Month.	1917.	1916.	1915.	1914.	1913.	1912.	1911.	1910.	1909.	1908.
January	76.37	70.66	80.68	83.91	76.44	79.16	77.34	72.44	74.71	79.75
February	86.15	71.78	79.77	88.97	78.01	77.10	77.97	73.12	75.01	80.82
March	77.04	69.98	74.04	78.31	78.87	71.94	71.47	68.47	68.88	73.99
April	74.79	68.73	70.97	76.47	78.06	77.61	69.23	70.30	68.52	71.85

An examination of this table shows conclusively that so far as operating ratios may be used as a barometer, the first four months of 1917 do not necessarily predict unfavorable results for the entire year. In fact, it will be observed that for the banner year 1913, three out of the four operating ratios were more unfavorable than the corresponding ratios for 1917. I would be unwilling to state that this necessarily indicates that 1917 will result in larger net incomes than 1913, but I am equally unwilling to agree that the ratios for 1917 and the relatively unfavorable indications of certain other factors together support the conclusion that an emergency now exists which requires an immediate increase in the scale of class rates. Future events may justify this increase. Events up to the present have not done so.

COMMISSIONER MCHORD'S OPINION

McChord, Commissioner, dissenting:

Upon the facts before us, I concur in the dissent by Commissioner Meyer. The issue presented is in reality one largely of governmental policy, rather than a question whether the rates sought to be made effective July 1 are reasonable for the service of transportation. The nation is at war, costs of fuel and other commodities are abnormal, the conditions affecting the volume and movement of traffic are without precedent. The future of these conditions, immediate or remote, can not be predicted with even a fair degree of certainty. Thus the situation before us is not sufficiently normal or stable in character to make possible an intelligent inquiry into the reasonableness of rates. That the operating costs of certain carriers, particularly in eastern territory, have been substantially increased by the increased costs of fuel and supplies is apparent.

Should this commission upon the showing here made approve an increase of rates predicated in a large measure upon prophecies for the future, to strengthen the credit of the carriers, or should the prices of fuel and supplies be supervised by governmental authority? It is argued with much force that this is a question for the Congress to determine and that until it is clear that such control will not be exercised and that the carriers' fears as to what may happen in the future have been realized, this commission can not be justified in placing the burden upon the general public in the form of increased rates, especially in view of the showing made by the carriers as to their earnings. At the present moment it appears probable that the Congress will act in the matter. The Committee on Interstate and Foreign Commerce of the Senate is now holding hearings on the general subject of the control of prices. Coal operators have been in conference with the Federal Trade Commission and other government officers on the same subject. It appears that

a special committee representing coal operators in all sections of the country has proposed that prices of coal during the war be fixed by a joint governmental commission. Congress has now before it the report and recommendations of the Federal Trade Commission on the bituminous coal situation. No report has yet been made to the Congress by the commission appointed by the President to observe the operation and effects of the so-called Adamson law. It may be fairly said that the matter of the governmental control of prices of various important commodities affecting these carriers is now before the Congress.

With reference to the assertion that prices of certain commodities are affected by car supply it should be remembered that by the car service act, approved May 29, 1917, the Congress has given this commission full authority over the movement, distribution, exchange, interchange and return of cars, and I do not doubt that through a vigorous exercise of that authority substantially better transportation conditions and additional revenue can be secured.

It is my judgment, therefore, that this commission should report to the Congress the essential facts disclosed by this record. If it should be determined by that body that the prices demanded of the carriers for fuel and supplies are reasonable under present conditions, or are not such as to warrant control by the government, and it should hereafter appear that the apprehensions expressed by the carriers have been realized, then I am prepared to sanction such rate increases as will permit the carriers to so equip themselves as to enable them to perform, in the most efficient manner, the transportation required of them.

Operating revenues sufficient to enable the carriers to perform their full duties are unquestionably required. In the event that the apprehensions expressed by the carriers are realized and increased charges for transportation become necessary, I would not limit those increases to certain classes of traffic, nor, in the absence of very clear proof of differences in conditions, to particular sections of the country. Rate increases, made necessary by war conditions, should be borne by all sections of the country and all classes of traffic, in so far as influences of those conditions are national in scope.

It is admitted by the carriers that they do not seek the increase in freight rates for the purpose of purchasing additional equipment, motive power, or extension of terminals, but for the sole purpose of paying increased cost of wages, material, fuel and supplies.

AIR COMMERCE AFTER THE WAR.—At a recent meeting of the Aeronautical Society of Great Britain a paper on "Commercial Aeronautics" was read by G. Holt Thomas, one of the pioneers of aviation in that country. Mr. Thomas said that in his opinion aeronautics would revolutionize the world not only from a commercial point, but also from a humanitarian point much more than it had revolutionized war. He said he was not one of those who thought commercial aeronautics were going to beat out of existence the railroads and other forms of transport, but rather that flying would act as an adjunct to present modes of transport. From a business point of view speed was everything. The airplane would enable a business man to leave London in the morning, go to business in Paris and be home again to dinner. It would take him to Bagdad in a day and a half or to New York in two days. Ceylon would become 2½ days from London, Tokio 4½, Sydney five, Cape Town 3½, and Vancouver 3. As for the question of cost it would be possible to run a profitable air service between London and Paris at \$25 a passenger, a cent an ounce for mail and 50 cents each for parcels of three pounds. A Constantinople or Moscow journey of twenty-four hours might involve a cost of \$125 a ticket.

WORK OF THE RAILROADS' WAR BOARD

The Railroads' War Board has received the first installment of replies to its request for information to be reported by the roads monthly for the purpose of ascertaining what results are being obtained by the American railroads in increasing their operating efficiency.

Fairfax Harrison, chairman of the War Board, has authorized the following statement regarding the results for April: "The Railroads' War Board has received so far reports of the service performed for the public in April last by 51 per cent of the mileage of the railroads of the United States. It shows the astonishing fact that the railroads produced and delivered to the public more than three billion ton-miles of freight transportation in excess of their performance in April, 1916, when also business was at high tide.

"This result was accomplished with the movement of but 4.3 per cent more locomotive miles and 5 per cent more freight car miles, resulting in an increase of 66 tons or 10.4 per cent per train, and 2.4 tons or 10 per cent per lading of cars—equivalent to the addition of 126,000 cars to the equipment of the roads reporting.

"To form some conception of the increase of 16 per cent, or 3,354,000,000 ton miles, in one month, on the mileage covered by the report, it is equivalent to adding 35,000 miles of railroad to the roads of the United States, with a density of freight traffic on each mile equal to the average density for all railroads of the United States for 1915. This addition to the fixed plant of the railroads exceeds the total mileage of the railroads of Great Britain in 1914 of 24,000 miles, and nearly equals the total mileage of the railroads of Germany in 1913 of 38,154 miles."

Mr. Harrison also authorizes the statement that the drive the Railroads' War Board is making to get railroads and shippers of the United States, as an imperative step in national defense, to make every freight car do the work that two did before the war, is having telling effect. Reports received by the board indicate prompt acceptance of its suggestion that loading freight cars 10 per cent in excess of their marked capacity would be equivalent to adding immediately to the supply of available equipment approximately 200,000 cars.

The report of the Commission on Car Service shows that one railroad in the month of April hauled 2.92 tons more per car than in April of last year, thus saving on this one road the use of 58,473 cars. In the month of May the same railroad hauled 1,414 pounds more of less-than-carload freight per car than in May, 1916. This saved 6,319 cars.

Three thousand cars of cement, coal, slate, and limestone on one railroad were checked to see what progress was being made in the campaign for heavier loading of cars carrying these commodities. The result showed that practically every car was hauling more than its marked capacity.

Inspectors sent out by the Commission on Car Service are watching the loading of cars in all parts of the country to insure the full use of all equipment. Last week 12 copper companies, and a number of lumber carrying roads, were informed that they were not loading cars to the full capacity and they were asked to make better use of cars from patriotic motives alone.

To help those producing communities, and shippers, and those railroads, which by reason of their economic situation are suffering from a shortage of freight cars, the Commission on Car Service has ordered those railroads, on which cars accumulate in congested territories, to turn over to roads on which shortage exists cars to the number of 34,245. These cars are being sent in train load lots direct to the points where they are most needed. Reports up to June 28 showed that more than 19,000 of these cars had already been delivered.

The French, Italian and British governments have appointed a traffic executive to co-ordinate rail and water

transportation of supplies and materials purchased by those governments in this country. D. W. Cooke, vice-president in charge of traffic of the Erie, has been appointed to act as the representative of the traffic executive in charge of railroad transportation in this country and arrangements have been concluded to provide for co-operation in all possible ways between the traffic executive and the Commission on Car Service.

In the interest of freight car efficiency, the Master Car Builders' Association has been directed to modify its rules for the period of the war so as to make possible the use of any material that is on hand which will enable cars being held for repairs to be put into service without waiting for material from the owning road.

The Sub-Committee on Materials and Supplies has been instrumental in arranging for meetings between representatives of the steel and car building companies for the purpose of co-ordinating the material and supply situation. It has also held conferences with the priority committee of the general munitions board of the Council of National Defense regarding the needs for railway materials and has been informally advised that all material necessary for the continuous and safe operation of railways should be classed as necessities ranking with the requirements of the government.

The Sub-Committee on Military Transportation Accounting has compiled and issued way-billing and accounting regulations for the prompt transportation of material for cantonments and has been working on similar regulations for material for the aviation camps. Accounting officers are located at the army camps in 41 States, keeping in close touch with all accounting and government requirements. They appoint, supervise and direct accountants or field representatives at concentration camps wherever needed.

The Sub-Committee on Military Passenger Traffic, after extensive negotiations with the administrative officers of the army, navy and marine corps, has made arrangements whereby complete routings are now available between points on the Mexican border and military posts and the various ports for the regular army organizations, between home stations and mobilization points for the National Guard, between home stations and cantonments for the National Army, and between cantonment camps and seaports for the National Army. These routings have been arranged with a view to consolidating movements of troops via the most direct and serviceable routes, affording to the government a maximum of facilities and the greatest efficiency in transportation with the special object of avoiding congestion and delays, thereby relieving the government of a vast amount of detail. Routing plans have been approved by the Secretaries of War and Navy and by the Comptroller of the Treasury, and have been distributed among various government departments and the carriers. A total of 221 carriers, including steamship lines, are represented in these routings.

In addition to the sites for army camps mentioned in the *Railway Age Gazette* of June 22, the War Department has announced the following additional concentration camps for the National Guard: Greenville and Spartanburg, S. C.; Fayetteville, N. C.; Macon and Augusta, Ga.; and Anniston and Montgomery, Ala. The government has also announced the following as sites for aviation camps: Belleville, Ill.; Dayton, O.; Mt. Clemens, Mich., and Rantoul, Ill.

COST OF COAL ON SWISS RAILWAYS.—The quantity of coal used yearly by the Swiss Federal railways is as follows: In 1915, 636,298 short tons, or 33 pounds per kilometer of 0.621 mile; in 1916, 652,884 tons, or 34 pounds per kilometer. The average price per ton paid for coal by the Swiss Federal Railways during the past 5 years was as follows: In 1912, \$5.27 per ton of 2,204 pounds; in 1913, \$5.22; in 1914, \$5.17; in 1915, \$5.15; in 1916, \$6.17.

American Society for Testing Materials

A Brief Report of the Proceedings of the Twentieth
Annual Meeting Held Last Week in Atlantic City, N. J.

THE annual meeting of the American Society for Testing Materials was held at the Hotel Traymore, Atlantic City, N. J., June 26-29, 1917. The following is a brief abstract of some of the numerous reports presented at the meeting which are of direct interest to railroad men.

COMMITTEE ON STEEL

The Committee on Steel of which C. D. Young, Pennsylvania Railroad, is chairman, is now composed of 18 subcommittees, the Committee on Cold Drawn Steel having been merged with the Committee on Steel and a new subcommittee on Heat Drawing Steel Stock now being in the course of organization. A special committee has been organized to harmonize the bend test requirements in the various specifications for steel.

The committee recommended a number of revisions in both standard specifications and tentative standard specifications and proposed a new tentative standard specification for carbon tool steel. The standard specifications for which revisions were proposed are those for blooms, billets and slabs for carbon steel forgings; carbon steel and alloy steel forgings; quenched-and-tempered carbon steel axles, shafts, etc.; quenched-and-tempered alloy steel axles, shafts, etc.; lap welded and seamless steel boiler tubes, etc., for locomotives; lap welded seamless steel and wrought iron boiler tubes for stationary service; welded steel and wrought iron pipes, and boiler and firebox steel for locomotives.

CARBON TOOL STEEL

1. These specifications cover carbon tool steel in ten classes and three grades, determined by the chemical composition specified in Section 3.

2. The steel shall be made by the crucible or electric process, with the exception of Grade C, which may be made by the open-hearth process.

3. The steel shall conform to the following requirements as to chemical composition:

Elements Considered	Grade A	Grade B	Grade C
Class No.			
1.....	0.45—0.60	(Same as Grade A)	(Same as Grade A)
2.....	0.60—0.75		
3.....	0.75—0.90		
4.....	0.90—1.05		
Carbon, per cent	5..... 1.05—1.20		
	6..... 1.20—1.35		
	7..... 1.35—1.50		
	8..... 1.50—1.65		
	9..... 1.65—1.80		
	10..... 1.80—1.95		
Manganese, max., per cent.....	0.40	0.45	0.60
Phosphorus, max., per cent.....	0.02	0.025	0.035
Sulfur, max., per cent.....	0.02	0.035	0.04
Silicon, max., per cent.....	0.35	0.35	0.25

4. In case of dispute, the chemical analyses shall be made in accordance with the Standard Methods for Chemical Analysis of Plain Carbon Steel (Serial Designation: A 33) of the American Society for Testing Materials.

5. The permissible variations in the size of the material ordered shall be agreed upon by the contractor and the purchaser.

6. The material shall be free from injurious defects, and shall have a workmanlike finish.

7. The identification marks to be placed on the material shall be agreed upon by the contractor and the purchaser.

8. The contractor shall afford the inspector, free of cost, all reasonable facilities to satisfy him that the material is being furnished in accordance with these specifications.

9. Material which does not conform to the chemical

composition and agreed variations, or which shows injurious defects, will be rejected, and the contractor shall be notified.

SPECIFICATIONS FOR STEEL TIE PLATES

1. The steel may be made by the Bessemer or open-hearth process.

2. The steel shall conform to the following requirements as to chemical composition:

Phosphorus	Bessemer.....	not over 0.10 per cent
	Open-hearth.....	not over 0.05 per cent

3. (a) For steel made by the Bessemer process, the manufacturer shall furnish the inspector daily, carbon and phosphorus determinations for each melt before the tie plates are shipped, and two chemical analyses every 24 hours representing the average of the elements carbon, manganese, phosphorus and sulphur contained in the steel, one for each day and night turn, respectively. These analyses shall be made on drillings taken from the ladle test ingot not less than $\frac{1}{8}$ in. beneath the surface.

(b) An analysis of each melt of open-hearth steel shall be made by the manufacturer to determine the percentages of carbon, manganese, phosphorus and sulphur. This analysis shall be made from a test ingot taken during the pouring of the melt. The chemical composition thus determined shall be reported to the purchaser or his representative, and shall conform to the requirements in Section 3.

4. An analysis may be made by the purchaser from a finished tie plate representing each melt of open-hearth steel, and each melt or lot of 10 tons of Bessemer steel. The phosphorus content thus determined shall not exceed that specified in Section 2 by more than 25 per cent.

5. (a) Except as specified in paragraph (b), the tie plates shall conform to the following minimum requirements as to tensile properties:

Tensile strength, lb. per sq. in.....	64,000
Yield point, lb. per sq. in.....	0.5 tens. str. 1,500,000
Elongation in 2 in., per cent.....	Tens. str.
but in no case less than 18 per cent	
Elongation in 8 in., per cent.....	1,400,000
but in no case less than 16 per cent	Tens. str.
Reduction of area, per cent.....	25

(b) Tie plates in which the material required to be punched is $\frac{5}{8}$ in. or greater in thickness, shall conform to the following minimum requirements as to tensile properties:

Tensile strength, lb. per sq. in.....	55,000
Yield point, lb. per sq. in.....	0.5 tens. str. 1,500,000
Elongation in 2 in., per cent.....	Tens. str.
but in no case less than 20 per cent	
Elongation in 8 in., per cent.....	1,400,000
but in no case less than 18 per cent	Tens. str.
Reduction of area, per cent.....	30

(c) If desired by the purchaser, or if for the reason that the design of the tie plate does not permit proper physical testing, the material may be purchased to chemical composition only; in such case the minimum carbon shall be:

Corresponding Minimum Tensile Strength.....	Bessemer.....	Open-Hearth.....
64,000 lb. per sq. in.....	0.12 per cent	0.20 per cent
55,000 lb. per sq. in.....	0.08 per cent	0.15 per cent

6. (a) The tension test specimens shall be taken from the finished tie plates, or from the rolled bar. They shall be cut so that the sides of the specimens are parallel to the direction in which the tie plates have been rolled.

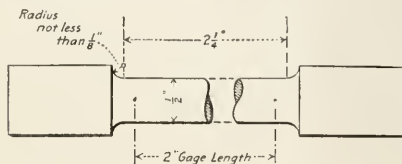
(b) Tension test specimens may conform to the essential dimensions shown in Fig. 1 or Fig. 2. The 2-in. speci-

men (Fig. 1) shall have filleted shoulders, or threaded ends, to fit into the holders on the testing machine in such a way that the line of action of the force exerted by the testing machine shall coincide with the axis of the specimen.

(c) Or, tension test specimens may be rectangular in section, in which case they shall be not less than $\frac{1}{2}$ in. in width between the planed sides, and shall have two parallel faces as rolled. When the tie plates are of such a design that the rectangular specimens cannot be obtained without projecting ribs, these shall be planed off before the tests are made.

7. (a) One tension test shall be made from each melt of open-hearth steel, and from each melt or lot of 10 tons of Bessemer steel.

(b) If any test specimen shows defective machining, or



Note.—The Gage Length, Parallel Portions and Fillets shall be as Shown, but the Ends may be of any Form which will fit the Holders of the Testing Machine.

FIG. 1.

develops flaws, or if it breaks outside the gage length, it may be discarded and another specimen substituted.

8. (a) If the percentage of elongation of any tension test specimen is less than that specified in Section 5, a retest shall be allowed.

(b) If the percentage of elongation of any tension test specimen is less than that specified in section 5 and any part of the fracture is more than $\frac{3}{4}$ in. from the center of the gage length of a 2-in. specimen or is outside the middle third of the gage length of an 8-in. specimen, as indicated by scribe scratches marked on the specimen before testing, a retest shall be allowed.

9. The tie plates shall be smoothly rolled, true to templet, and shall be straight and out of wind on the surface which

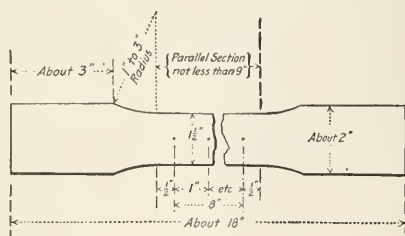


FIG. 2.

will form the bearing for the rail. They shall be sheared to the length and punched to the dimensions specified by the purchaser, with the following permissible variations:

(a) For plates with shoulders parallel to the direction of rolling, a variation of $\frac{1}{32}$ in. in thickness, $\frac{1}{8}$ in. in rolled width, and $\frac{3}{16}$ in. in sheared length will be permitted.

(b) For plates with shoulders perpendicular to the direction of rolling, a variation of $\frac{1}{32}$ in. in thickness, $\frac{1}{8}$ in. in rolled width, and $\frac{1}{4}$ in. in sheared length will be permitted. The distance from face of shoulder to outside end of plate shall not vary more than $\frac{1}{4}$ in., and from face of shoulder to inside end not more than $\frac{1}{2}$ in.

10. The finished tie plates shall be free from burrs and other surface deformations caused by the shearing and punch-

ing; they shall also be free from other injurious defects and shall have a workmanlike finish.

11. The name or brand of the manufacturer, the section and the year of manufacture shall be rolled in raised letters and figures on the outside of the shoulder of the plates, and a portion of this marking shall appear on each finished tie plate.

12. The inspector representing the purchaser shall have free entry, at all times while work on the contract of the purchaser is being performed, to all parts of the manufacturer's works which concern the manufacture of the tie plates ordered. The manufacturer shall afford the inspector, free of cost, all reasonable facilities to satisfy him that the tie plates are being furnished in accordance with these specifications. All tests (except check analyses) and inspection shall be made at the place of manufacture prior to shipment, unless otherwise specified, and shall be so conducted as not to interfere unnecessarily with the operation of the works.

13. Unless otherwise specified, any rejection based on tests made in accordance with Section 4 shall be reported within five working days from the receipt of samples.

(b) Tie plates which show injurious defects subsequent to their acceptance at the manufacturer's works will be rejected, and the manufacturer shall be notified.

14. Samples tested in accordance with Section 4, which represent rejected tie plates, shall be preserved for two weeks from the date of the test report. In case of dissatisfaction with the results of the tests, the manufacturer may make claim for a rehearing within that time.

THE EFFECTS OF GRADING OF SANDS AND CONSISTENCY OF MIX UPON THE STRENGTH OF PLAIN AND REINFORCED CONCRETE

By L. N. Edwards.

This paper describes the methods used in a series of experimental tests undertaken to secure information relating to (1) the influence of the grading of sand, (2) the effect of the consistency of mix upon the strength and physical characteristics of the concrete produced, and (3) the effect of varying the time of mixing.

To give the results observed and the phenomena observed from tests made upon (1) cylinders in which 12 sands of predetermined gradings were used as sand aggregates, (2) cylinders and reinforced-concrete beams in the preparation of which five consistencies of mix were used, and (3) cylinders for which the time of mixing was varied from $\frac{1}{4}$ to 2 min. In the preparation of the test specimens the field conditions accompanying high-grade concrete construction operations were duplicated in so far as practicable.

From a careful consideration of the results obtained and of the phenomena observed, the following conclusions appear to be warranted in regard to the grading of sand.

1. The commonly practiced "visual examination" test of sand aggregate for concrete is generally unreliable, since it gives at best only a superficial knowledge of the cleanliness of a given sand. Its adaptation to the determination of grading could be of value to the observer only after long experience in the granulometric analysis of sands.

2. The generally accepted practice of proportioning a concrete mix by volume, as, for example, 1 part cement, 2 parts sand and 4 parts broken stone is impracticable and unscientific, since it does not take into account the adaptability of the grading of a given sand to the production of a dense, strong and reliable concrete. Proportioning by volume, as commonly used, gives no guarantee of the production of a concrete having a desired strength, hardness, or other physical properties.

3. The strength, toughness and durability of concrete to be secured from the use of a given sand can be determined only by actual test of that sand in a properly prepared concrete.

4. In field operations incident to spading, slicing, or otherwise compacting the concrete, the movement of the water content of the mass is intensified, whenever the sand aggregate contains insufficient fine material to hold the cement in suspension by the formation of an adequate amount of sandy paste. The free movement of the water tends to produce an improper distribution of the cement.

The table below gives the percentage of water used in the tests for consistency of mix expressed in per cent of the total dry weight of the cement and aggregates and to the cement alone. In connection with the data given in this table, it must be borne in mind that all concrete materials were thoroughly dry when deposited in the mixer drum.

PERCENTAGE OF WATER USED IN TESTS FOR GRADING OF SANDS AND CONSISTENCY OF MIX					
Test.	Kind of Specimen.	1:2:4 Percentage of Water to Dry Weight of		1:2½:5 Percentage of Water to Dry Weight of	
		Cement and Aggregates.	Cement.	Cement and Aggregates.	Cement.
Grading of sands.	.....	6.17	41.14	5.99	48.76
Consistency:					
First	{ Beam	6.48	43.36	.....	.....
	{ Cylinder	6.17	41.14	5.99	48.76
Second	{ Beam	7.13	47.70	.....	.....
	{ Cylinder	6.75	45.25	6.59	53.64
Third	{ Beam	7.78	52.03	.....	.....
	{ Cylinder	7.37	49.37	7.19	58.51
Fourth	{ Beam	8.75	58.52	.....	.....
	{ Cylinder	8.28	55.54	8.09	65.83
Fifth	{ Beam	9.72	65.04	.....	.....
	{ Cylinder	9.26	61.71	8.99	73.14

Fig. 1 shows the compressive strengths obtained from the tests of the cylinders, in which the consistency of the mix

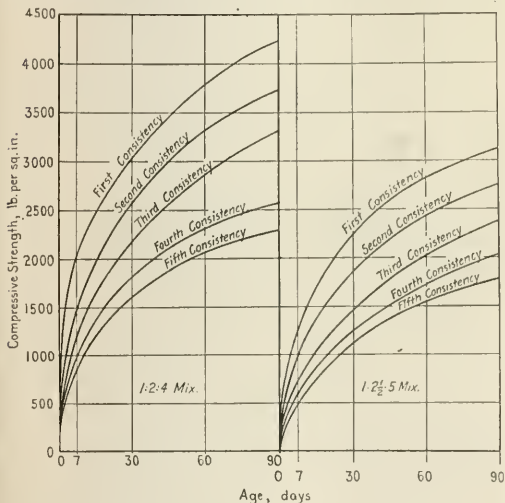


Fig. 1—Compressive Strengths of Test Cylinders of Different Consistencies

was varied from a sticky, semi-plastic to a very wet condition. The sand and stone were of limestone origin.

Several conclusions may be drawn from these results. The use of a quantity of water sufficient to produce a concrete, the mortar component of which is of a saturated, sticky, semi-plastic consistency, is for most practical purposes required, in order to facilitate economical and efficient placing. This quantity of water is ample for the development of the proper functions of the cement. An increase in the quantity of water used results in a proportionate decrease in the strength of the concrete. This decrease is in no sense a function of the proportions of the mix.

The results of the test on the influence of time of mixing

are shown in Fig. 2. The abrupt change in the direction of the curve at the location indicating the 1 to 2-minute period of mixing, together with the rapid increase of strength shown for mixing periods of less than 1-minute duration,

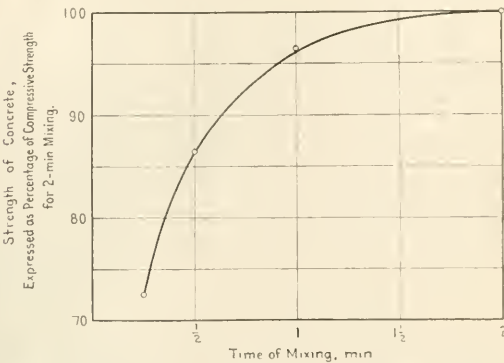


Fig. 2—Relation of Time of Mixing to Compressive Strength of Concrete

show conclusively the advantage gained by continuing the mixing operation for a period of from 1 to 2 minutes after all the materials have been placed in the mixer.

METAL PRIMER TESTS

By H. A. Gardner

In previous tests¹ the writer has observed that red lead which has been highly oxidized during production, and which is therefore practically a neutral pigment, is not as well suited for application to metal as red lead which is highly basic in nature and which contains a considerable percentage of litharge, the latter being a highly basic pigment. In the present tests the results obtained have been similar and have demonstrated the superior value of the incompletely oxidized or highly basic red leads. This was shown by an inspection of the paints at the end of 3 years' exposure, the results of which are recorded in Table I.

TABLE I—RATING OF PAINTS AT INSPECTION APRIL 1, 1917, AFTER THREE YEARS' EXPOSURE

10 = Excellent; 1 = Failed.

Panel No.	Pigment	Grade: Lead Tetraoxide Content, per cent	One-Coat Work		Two-Coat Work	
			Coat	Work	Coat	Work
1	Red Lead	86*	7	10		
2	Red Lead	88*	8	10		
3	Red Lead	90*	8	9		
4	Red Lead	93*	7	8		
5	Red Lead	95*	6	7		
6	Red Lead	99*	2	5		
7	Red Lead	98†	4	6		
8‡	Sublimed Blue Lead	.....			
9	Chromated Red Lead	Contains 2 per cent CrO ₃	8	10		
10	Chromated Iron Oxide	Contains 16 per cent CrO ₃	2	10		
11	Iron Oxide	Contains 16 per cent Zinc Chromate	2	9		
12	Iron Oxide	Contains 20 per cent Zinc Oxide	1	9		

* Balance is litharge.
† Special red lead purchased in paste form.
‡ Panel injured when exposed. Removed from test.

As a further result of the tests, it is quite apparent that two coats of the neutral iron-oxide paint (chromated or containing zinc chromate or zinc oxide) are superior to two coats of the neutral red-lead paint. The tests also demonstrate the excellent results to be obtained with one coat of a highly basic red lead. One of the most marked results from the tests was that showing the comparative durability of one and two-coat work on an iron-oxide-zinc oxide paint. This result would indicate that all metal should preferably be given at least two coats of paint when erected.

Storage Problems.—Much has been said regarding the

¹ Proceedings, Am. Soc. Test. Mats., Vol. IX, pp. 488-511 (1910); Vol. X, pp. 409-410 (1910); Vol. XI, pp. 192, 641 (1911); and Vol. XIII, pp. 363, 954 (1913).

hardening of red lead in packages, especially if the red lead should contain any pronounced percentage of litharge. It is interesting to record the condition of the paints used in these tests after standing for three years in half-gallon cans. When the cans were opened, some of the clear oil was removed from each package and asked to determine the amount of pigment that had gone into solution. The results of the tests indicate that red leads high in lead tetroxide are quite as soluble in linseed oil as red leads high in lead monoxide. The condition of the paints observed at the time of opening would seem to indicate that the softness of red-lead paints after aging is due not entirely to the amount of litharge contained therein but also to the settling properties of the red lead. In other words, red leads of high weight per volume will settle down to the bottom of the cans and become hard, whereas red leads of low specific gravity are more likely to be maintained in a bulky form.

The results obtained in the storage tests indicate that some chemical action takes place other than that to be accounted for by the formation of lead linoleate, since the latter is soft rather than hard. The writer is of the opinion that the chemical reactions which are partly responsible for the hardening of red-lead paints, cause the formation of lead glycerinate, a substance that is recognized as one of the hardest and most durable cementing materials. It is obvious, therefore, that linseed oil having a high acid number and often containing a substantial amount of free glycerin, is dangerous to use in making red-lead paints that are to remain in packages for a long period previous to use.

With linseed oil it is probable that a substance having a solvent effect upon lead glycerinate, such, for instance, as certain alcoholic derivatives, could be combined. These would evaporate when the paint was applied and the formation of the valuable lead glycerinate cement might proceed during the drying of the oil. For this purpose, red leads high in litharge would be most active.

PROPOSED TENTATIVE TESTS FOR MOLDED INSULATING MATERIALS

These tests are intended to apply to all solid insulating materials that are formed in molds or between platens by the application of pressure, either with or without heat. The report covers, in considerable detail, a description of the specimens, the apparatus, and the methods for making all necessary tests on molded electric insulating materials. The committee also presents six illustrations of the testing apparatus recommended.

The tests for physical properties are divided between mechanical, electrical and thermal tests. Under the former, detailed directions and specifications are given for determining the tensile strength, compressive strength and transverse strength. Under the electrical tests complete directions are given for determining the dielectric strength. Under several tests directions are given to determine the characteristics of the material under heat. Complete directions for making tests to determine the effect of moisture are also given. Under each one of these tests the specimen is fully described by a drawing and specifications. This is also true of the apparatus. The methods used for making each test are then described in detail. The last item in each test is a report form which specifies how the results of the test shall be reported.

OTHER BUSINESS

In the field of concrete engineering Committee C 2 submitted the final report of the joint committee on concrete and reinforced concrete. This does not differ from the form in which it was adopted by the committee in 1916, a review of which appeared in the *Railway Age Gazette* on January 19, 1917, page 100. Proposed tentative specifications for

mason's hydrated lime were also submitted, as well as proposed tentative specifications for asphalt for waterproofing, for the primer for use with asphalt for waterproofing, for coal tar pitch for waterproofing, and for creosote oil for the priming coat with coal tar pitch for waterproofing.

A brief review was given of the rail situation with brief abstracts of the reports of the investigations published during the year. These included J. E. Howard's report of the investigation of the rail failure at Iser, Tex., on the Galveston, Harrisburg & San Antonio; Dr. P. H. Dudley's report in bulletin No. 195 of the American Railway Engineering Association on induced interior transverse fissures, and H. M. Wickhorst's report in bulletin No. 195 on the rail failure situation.

A. T. Goldbeck presented a paper on the distribution of pressure through earth fills based on carefully conducted tests with specially prepared pressure measuring apparatus. Conclusive results were secured but the range of pressures and applications of the load were designed to cover highway conditions rather than those obtaining under railway tracks.

The following officers were elected for the ensuing year: President, General W. H. Bixby; vice-president, Edward Orton, Jr.; executive committee, J. A. Capp, W. F. M. Goss, W. M. Kinney, and C. D. Young.

THE PENNSYLVANIA'S NEW METHOD OF HANDLING L. C. L. FREIGHT

Plans have been worked out by the Pennsylvania, and will shortly be put into actual operation, for making a complete change in the methods of receiving, loading and forwarding less than carload freight, of all descriptions, on all parts of the Pennsylvania Lines East.

The two most important features of the new plan are:

1. The inauguration of shipping days—or substantially "sailing dates"—on which cars will depart from various points of origin to specified destinations; freight will be accepted on the proper shipping days, only, and the cars will "sail" as specified.

2. The designation of particular stations at which freight will be exclusively received for specified destinations; freight for such points will be accepted at the stations named only.

The new plan represents the results of prolonged investigation, conducted by the transportation and traffic officers.

The primary purposes of the new plan are:

- (1) Elimination of the delay incident to the re-handling of freight, under the present methods of consolidating small shipments into full carloads at transfer stations; this will give the shipper quicker service than is possible under the old method.

- (2) Conservation of car supply by effecting better average loading than is possible under the transfer system; this will increase the cars available for commercial freight, as well as government supplies.

- (3) Reduction in the number of car and train movements required to transport a given volume of freight; this will increase the capacity of the whole railroad plant, and will release trackage and locomotives for the movement of troops, government supplies and commercial freight.

- (4) Improvement in the regularity of the freight service by systematizing and simplifying operation; this will result from the elimination of a large proportion of the complicated re-handling of freight, which is now unavoidable, with the attendant liability to damage.

Under the present method of handling less than carload freight, a shipper having a small consignment to transport from city "A" to city "B" can take his goods to any freight station in city "A," at any time during the ordinary working hours. In the course of the day, or perhaps the next two or three days, the freight will be loaded into a car and run out to a transfer station, which may be a few miles or more

than 100 miles distant. There it will be unloaded and trucked into another car, in which numerous small shipments, from many other points, for city "B," are being consolidated in the effort to make up a full car.

Under the proposed plan, there will be certain days on which less than carload freight for city "B" will be accepted at one or more specified stations in city "A," and such freight will be accepted only on the days, and at the particular station, or stations, named. On the days specified, a car for city "B" will leave the originating station or stations. The service will be daily, tri-weekly, semi-weekly or weekly according to the average volume of the traffic, and freight for city "B" will be taken only in such cars. Under this method there will be no subsequent transferring or re-handling of the freight, and the car will move straight through to city "B," without breaking bulk.

In large cities, where a number of freight stations are maintained, traffic to the various principal destinations will be apportioned between the stations. For example, where conditions permit, very large shipping centers will be subdivided into zones, each embracing several freight stations. From each zone service will be given on specified days to a number of destinations. In such cases, cars for various points will be alternated between the stations in a given zone. If, for instance, a certain zone, containing several freight stations, is to have three cars a week to a certain destination, the car may leave station "A" on Monday, station "B" on Wednesday and station "C" on Saturday. This will equalize drayage distance between shippers in various portions of the zone.

To eliminate the congestion of trucks and teams occurring at nearly all large freight stations in the afternoon, the "sailing hours" of cars for certain destinations will be made earlier than the general closing time of the station. To illustrate—at a station from which several regular cars are operated daily, to sundry destinations, the "sailing time" for the cars to city "B" and city "C" may be fixed at noon, and for city "D" and city "E" at 1 o'clock p. m., while freight for other points may be accepted up to the closing hour.

This will require the delivery of a considerable quantity of freight in the morning hours of the "sailing day." The result will be to distribute the receipts throughout the day, extend the capacity of the station and facilitate the movement of traffic. Shippers will be benefited, as their teams and trucks will not be forced to stand idle for several hours before being able to get to the platform, as is often the case under the present conditions.

The application of the plan at smaller stations—those at which l. c. l. freight would not accumulate into carloads with sufficient frequency to operate through cars to any given point—will be limited to the establishment of shipping days.

It is the intention to continue sufficient local "pick-up" freight service to meet the requirements for that form of service.

One important result which the plan is expected to bring about will be a reduction in loss and damage to freight, owing to the greater promptness with which it will be loaded and despatched. The simplification of railroad operation, as well as the elimination of re-handling of less than carload freight at transfer stations, will also diminish the amount of freight going astray.

The proposed plan is being worked out on scientific lines. A most careful and elaborate study has been made of the movement of less than carload freight to and from all points on the entire railroad and its connections, and the nature and frequency of service to be afforded at each station will be based upon that study. Future changes in the current of traffic will be taken care of promptly, as they become evident.

A conservative estimate shows that the adoption of the proposed plan will result in the saving of at least 1,000 box

cars per day in the handling of l. c. l. freight on the lines East.

The new plan will be put into effect first in the Philadelphia district, where it will become operative in the near future. As soon thereafter as possible it will be applied at New York, Baltimore, Pittsburgh and Buffalo, following which it will be inaugurated at all stations.

When making the new plan effective in any locality, it will be explained, as to its purpose and method of operation, to the local board of trade, chamber of commerce and other trade bodies. This duty will be performed personally by the various division freight agents.

The working out of details for the various stations will be completed on each grand division, under the joint direction of H. C. Bixler, superintendent of stations and transfers, and the proper division freight agent representing, respectively, the transportation and traffic departments. They will be assisted in this work by the staffs of the division superintendents.

ELECTRIC TIE TAMPERS

Electric tie tampers were first used by the New York Central in the electric zone where the power is taken from the third rail and conveyed to the machine through resistance boxes by means of a contact device which is laid across the rail. After being thoroughly tested in this district with satisfactory results, figures were compiled showing the amount of work done by regular track gangs supplied with tampers and by gangs not so equipped. Figures were also compiled showing the cost of doing certain units of work by hand and with the machines. When tamping by hand, it was found that 26 days were required to tamp one mile of track as compared with 15 days with a machine. The cost of the work showed a difference in favor of the machine of \$142 per mile of track.

As one of the results of these tests the use of the tampers was extended to the exterior zone where power is secured



Tamping Track in the Electric Zone

from a generating set mounted on a hand car. In the exterior zone the cost of tamping is less than in third rail territory when it is necessary to employ a man whose sole duty is to watch out for trains.

The machines used are the Vaughn type and weigh 90 lb. complete. The tamper, itself, weighs 80 lb. and the bar 4 lb. The motor is contained in a box on the side of the machine and drives a crank in the back of the casing. The crank moves a reciprocating cylinder within which is a free piston driven back and forth by the air compression in the cylinder and by a solenoid at the lower end of the tamper, the reciprocating cylinder shifting the magnetic field produced by the solenoid. The control is located in a switch mounted in the upper handles which are provided to sup-

port the tool. A specially designed nosepiece holds the tamping bar in place during operation.

As all the space necessary for the operation of the machines is that into which the tamping bar can be driven they are especially useful around switches and other points where the ties are closely spaced. In tamping, two of the machines are operated simultaneously from opposite sides of the tie which necessitates twice as much work as if the work were done by hand where only one side of the tie is tamped. As a result of tamping on opposite sides of the tie, the track will stay up longer and better than any method of hand tamping and the New York Central has track that was tamped in 1914 which has not been touched since.

A tabulation showing the cost of operating the tampers from the generator and from the third rail follows:

TIE TAMPERS OPERATED FROM A GENERATOR

Operation:	
Foreman, 10 hr. @ 27 ct.....	\$2.70
5 men, 10 hr. each = 50 hr. @ 19 ct.....	9.50
Gasoline, 4 gal. @ 20 ct.....	.80
Engine oil, $\frac{1}{2}$ pt. @ 5 ct.....	.03
Fixed Charges:	
Depreciation—generator @ 15 per cent.....	.42
Depreciation—two tampers @ 30 per cent.....	.67
Interest and maintenance—generators @ 10 per cent.....	.28
Interest and maintenance—two tampers @ 15 per cent.....	.33

Total per day.....	\$14.73
Average of 356 ft. tamped per day—total cost per foot.....	\$0.041

TIE TAMPERS OPERATED FROM THIRD RAIL

Operation:	
1 foreman, 10 hr. @ 27 ct.....	\$2.70
6 men, 10 hr. each = 60 hr. @ 19 ct.....	11.40
Power, 96 kw. hr. @ 1 ct.....	.96
Fixed Charges:	
Depreciation—two tampers @ 30 per cent.....	.67
Depreciation—two resistances @ 15 per cent.....	.08
Interest and maintenance—two tampers @ 15 per cent.....	.33
Interest and maintenance—two resistances @ 10 per cent.....	.06

Total per day.....	\$16.20
Average of 356 ft. tamped per day—total cost per foot.....	\$0.046

A PORTABLE CRANE FOR FREIGHT HOUSES

A new departure in freight handling equipment has recently been introduced which is designed to facilitate the moving of heavy articles encountered in l. c. l. freight. Briefly it is a small hand-operated crane mounted on wheels so that it can be moved about easily. It will lift objects



Lifting a Heavy Box

weighing up to two tons. The device consists of a gooseneck or jib crane, made up of a pair of curved cast iron arms bolted together and attached by a flanged base to a cast iron U-shaped platform or carriage. This is mounted on four wheels, one at the end of each arm and two at the base of the "U" where the crane is attached. The loads are raised and

lowered by a chain suspended from the end of the arm which is so placed, relative to the base, that both the crane and its load are always in stable equilibrium. The chain, which supports the load by two strands, passes down the inside of the arm over two rollers to a drum connected by a train of gears to a crank shaft. The latter is operated by either one or two crank handles, and is provided with a ratchet and pawl to hold the load.

The total height of the crane is only 6 ft. 6 in. and the width of base is 3 ft. 8 in. Consequently it can be taken anywhere around a freight terminal or into a car if desired. Because of the "U" shape given to the base, it is possible to place the crane so that the load comes directly under the hook, or to lower the load directly on to the floor or a small truck without interfering with the base.

These cranes have been found useful in a number of railway freight stations. One large road in the east has 25 of



Picking Up a Steel Casting

them at various local and terminal freight houses. One of the pictures shows the crane in use for lifting a steel casting weighing 1,580 lb. The construction of the crane is seen more clearly in the other photograph where a man is raising a large box. At the Wayne Junction transfer of the Philadelphia & Reading at Philadelphia, one of these cranes was used recently to pick up four steel 15-inch I-beams, 15 ft. long, having a total weight of 2,400 lb. The cranes have also been found particularly useful in handling any material that is awkward for men to pick up. One man can operate the crane alone for most purposes. When operated by two men it is possible to handle loads that previously required the assistance of 8 or 10 men. These cranes are manufactured by the Canton Foundry & Machine Company, Canton, Ohio.

LONDON INSPECTION OF ARGENTINE RAILROAD SUPPLIES.—A presidential decree dated March 29, 1917, abolishes the technical office hitherto maintained in London for the inspection of supplies purchased in Europe and the United States for the Argentine State and other railroads and public works. This office was created in 1909, and the reason given for its suppression at this time is that with the marked falling off in railway purchases and the diminished activity in the prosecution of public works there is no necessity for maintaining a separate organization for technical inspection.

Brown's Discipline on American Railroads

Four-Fifths of the Important Roads Have Abandoned the Policy of Suspending Employees for Misconduct

REGULATIONS for the administration of discipline without suspension are now in force on a large majority of the principal railroads of the United States, and the more prominent features of these regulations are shown in the large table given herewith and in the circular of the Chicago & Alton reprinted below. The practice of suspending men from duty as a means of punishment for disobedience or misconduct was formerly, as everybody knows, well nigh universal in American railway service; and the first extensive innovator was the late George R. Brown, of Corning, N. Y., general superintendent of the Fall Brook Coal Company's railroad, now a part of the New York Central. He began, experimentally, about 1886.

To gather the data here shown, inquiries were sent to 120 of the principal railroads of the United States and Canada, and all but a very few of them responded; and 80 of these roads are represented in Table A. Table C, showing roads still adhering to the old practice, contains 27 names.

In Table A some of the headings of the columns are abbreviated. The figures in column 4 refer to individual offenses; for example, on the Atlanta & West Point, no offense is to be assessed less than ten or more than 90 demerits. The figures in column 5 indicate the extent to which an employee may be disciplined by record before the superintendent takes special action. For example, on the Arizona Eastern when a man's record shows 60 demerits action is taken to see whether or not the individual ought to be dismissed; and a record of 90 demerits means that he must be dismissed.

Columns 6, 7 and 8 show typical examples, not a complete record. On some roads satisfactory service for as short a time as three months offsets a certain number of demerits; and on some there are six or eight, or more, different periods, ranging from three months to five years. See the notes against individual roads. The term "train service" includes enginemen and firemen. No specific request was made by us for comments or opinions as to the merits of this method of discipline, as compared with the practice of suspending employees, but opinions, where received, have been noted.

Educational bulletins, to give to all employees the benefits of the lessons derived from the errors of the few, are not dealt with in the table; but it may be said that such bulletins are very generally in use. Some roads issue them regularly, posting copies at employees' headquarters, while others issue them as occasion demands. A bulletin of the Canadian Pacific is reprinted below.

CHICAGO & ALTON

The general theory of the system of discipline herein described is well set forth in the following circular of A. P. Titus, general manager of the Chicago & Alton, which was issued on January 1, 1916.

Commencing January 1, 1916, the enforcement of discipline by suspension will be discontinued and discipline by demerit and merit record will be inaugurated.

Until further notice, this will apply only to employees in engine, train, yard, telegraph and station service.

1. The system is introduced with the belief that it will meet with the co-operation of all concerned and will be of benefit to the employee and company alike:

(a) To the employee in enabling him, by good conduct, to insure permanency of employment.

(b) To the company in increased efficiency of such permanent employee.

(c) To avoid loss of wages and consequent hardships to employees and their families because of being deprived of their regular income.

(d) To promote good conduct and encourage careful and efficient service.

2. Record will be kept by the superintendents of the service rendered by each employee under their respective jurisdictions. Each employee will be notified promptly in writing of entries made against his record and such notice in all cases will show the accumulative record. No discipline will be applied without full investigation.

Employees, if desired, will be given the opportunity for explanation and defense, with employees of their choice present, providing such application is filed with the superintendent within a reasonable time, but in no case to exceed thirty days.

3. An accumulation of demerits showing that an employee is not desirable for the service, will first be given special consideration, but when the service of an employee is so generally unsatisfactory as to unfit him for further service, dismissal will follow.

4. Bulletins showing cases of discipline, omitting name, date, train and location, containing a brief account of the facts in the case, and showing how the offense could have been avoided, will be issued monthly.

5. No employee will be unduly held out of service for investigation or in violation of current working schedules, but when held and found at fault, will not be paid for any time lost.

6. When an employee's demerits have accumulated to the number of eighty, he shall be called in by the superintendent, duly cautioned and advised that when his number of demerits amounts to 100, he will be dismissed from the service.

7. No discipline by record will be made for less than five nor more than thirty demerits.*

8. A perfect record will be one against which no unfavorable entry has been made.

9. A clear record will be one on which unfavorable entries have been cancelled.

10. Cautions, reprimands, and demerits by record will be charged against an employee's record as follows:

(a) A caution will be entered upon the record but will not call for a demerit.

(b) A reprimand will call for one demerit.

(c) One merit will equal and cancel two demerits.

(d) Merits and demerits will be accumulative.

11. Where demerits are given for unsatisfactory service, it is logical that merits should be given for good service, and cancellations upon record will be given as below:

1st. A clear record for six months will cancel 5 demerits.

2nd. A clear record for one year will cancel 10 demerits.

3rd. A clear record for two consecutive years will cancel 35 demerits.

*The most general practice is to assess, for an offense, a number of demerits equal to the number of days that the employee would have been suspended from duty, under the old plan.—EDITOR.

TABLE A AMERICAN RAILROADS ON WHICH EMPLOYEES ARE NOT PUNISHED BY SUSPENSION

See Explanations in Text

Road	Classes of service included	Year begun	Minimum and maximum demerits	Maximum permissible accumulation	Good service offsets demerits			Remarks
					Six mos.	12 mos.	18 mos.	
1	2	3	4	5	6	7	8	9
Algoma Cent. & H. B.	All except general staff.	.....	.....	.. 60	..	20	..	Well satisfied.
Ann Arbor	Train and yard.	.....	.....	.. 60	..	10	60	System is new; rules not fixed.
Arizona Eastern	All	1906	5-30	.. 60	..	30	..	Actual suspensions in some cases.
Arch. T. & S. F. (Coast L.)	All in operating dept.	1901	5-30	.. 60	..	30	..	.....
Atlanta & W. Point	Train, station, telegraph, yard.	.....	.....	.. 90	10	30	..	Actual suspensions in aggravated cases.
Atlanta, B. & A.	M. W. foremen	1912	10-90	.. 90	10	30	..	Very satisfactory.
Atlantic Coast Line	Ditto	.....	10-30	.. 90	10	30	..	Both "book" and actual suspensions in vogue.
Baltimore & Ohio	.....	1913	(See list B)	.....	..	..	..	.....
Bessemer & L. E.	Train, yard, sta., telegraph.	1898	.....	.. 60	10	30	..	Actual suspension in extreme cases. No credits for less than six months.
Boston & Albany	Train, yard	1914	(See list B)	.....	..	..	..	.....
Boston & Maine	Train, yard, station.	1896	.....	90	..	6 ²	..	.....
Buffalo, R. & Pittsburgh	Train, station, shop.	1912	.....	.....	10	30	..	Brown system for minor offenses only (see list B).
Canadian Gov't	All	1913	.....	.. 60	..	20	..	For every repetition of an offense by an employee the number of demerits is doubled.
Canadian Northern	All	1908	.....	.. 60	..	20	..	.....
Canadian Pacific (East)	All	.....	.....	.. 60	..	20	..	.....
Canadian Pacific (West)	All	.....	.....	.. 60	..	20	..	.....
Carolina, C. & O.	Train	1913	.....	75-100	..	30	..	Supt. writes personal commendatory letter when a man has completed a satisfactory yr.
Central of Georgia	Train, yard, telegraph, M. W. foremen, carpenters	1911	5-30	90	..	5	30	Ninety marks means suspension.
Central New England	Train, yard, agents, telegraph, signalmen	.....	.....	.....	..	..	..	.....
Chesapeake & Ohio	Train, telegraph	.....	.....	.....	1	3	..	One mark assessed for each offense. System in effect many years; satisfactory.
Chicago & Alton	Train, yard, telegraph, station.	1916	5-30	80-100	5	10 ³	N	Actual suspensions in extreme cases. Commendatory letters written for good records.
Chicago & E. Illinois	Train, yard, sta., telegraph.	.....	.....	60-90	..	..	..	.....
Chic. & Burlington	Train, yard (see list B)	.....	.....	.....	..	..	..	.....
Chicago, Mil. & St. P.	All	.....	10-30	No rule	..	..	..	.....
Chicago, R. I. & Pacific	Train, station, telegraph.	.....	.....	.. 65	..	30	..	Actual suspensions may be imposed.
C. R. I. & Gulf	(Same as above)	.....	.....	.....	..	..	..	.....
Chicago, St. P. M. & O.	Train, station	.....	.....	.....	..	..	..	.....
Cin. & Hamilton	(See list B)	1915	.....	.....	..	..	..	.....
Cin., Indianapolis & W.	Train, telegraph	.....	.....	.. 90	..	50	..	.....
Colorado & Southern	Train, yard, station.	.....	.....	.. 100	10	30	60	Actual suspensions may be imposed.
Copper Range	Train	.....	.....	.....	..	..	..	.....
Denver & Rio Grande	Train, yard, station.	1910	.....	.. 75	..	35	..	Employees "never serve time."
Detroit & Mackinac	Train (see list B)	.....	.....	.....	..	..	..	Records written up every month.
Elgin, Joliet & E.	Train, yard	.....	.....	.. 65	..	20	..	.....
El Paso & S. W.	All in transportation dept.	1906	10-60	Indefinite	10	30	60	.....
Florida East Coast	Train, yard	.....	.....	.....	..	..	..	Actual suspensions in extreme cases.
Fort Worth & Denver C.	All in operating dept.	1911	10-60	.. 100	..	30	..	Employs both actual and "book" suspensions.
Galveston, H. & S. A.	Train, yd., sta., M. W. foremen	.....	.....	90	..	10	30	Supt. make semi-annual summaries of action taken.
Georgia	Ditto	1915	10-90	90 ⁵	10	30	..	Actual suspensions in aggravated cases.
Great Northern	Train, yard, shop.	.....	.....	Indefinite	..	..	..	Credit mark is given for 6 mos. clear record.
Gulf & Ship Island	All op. depts., M. W. and shops except laborers	.....	.....	.. 90	10	20	30	Actual suspensions for men who do not appreciate the Brown system.
Hocking Valley	.....	1912	.....	Indefinite	..	30	..	.....
Hudson & Manhattan	All in transportation dept.	.....	.....	.. 60	..	25	..	.....
Illinois Central	Ditto	1902	5-30	90	..	5	30	60
Lehigh & New England	Train	1913	.....	.. 30	30	90	..	.....
Lehigh Valley	Train, yard, station ⁴	.....	5-60	75-90	10	30	60	Dismissal for 90 demerits may be appealed to general manager, who may grant 6 months' further probationary period.
Los Angeles & Salt Lake	Train, yard, station, trackmen	.....	.....	.. 90	..	..	..	Four months cancels 10 demerits.
Louisville & Nashville	Train, yard, telegraph, M. W. foremen, car inspectors.	1895	.....	60	..	..	..	Two years cancels 30 demerits; three years, 60 demerits. Bulletins issued weekly.
Maine Central	All except general office	1897	.....	.. 100	..	6	..	Five years cancels all.
Michigan Central	(See list B)	.....	.....	.....	..	..	..	.....
Minn., St. Paul & S. S. M.	Trainmen	.....	.....	7	..	4	..	.....
Missouri, K. & Texas	All, except laborers	.....	.....	.. 60	10	25	..	Actual suspension may be imposed.
Missouri Pacific	Train, yard	.....	.....	.. 65	..	35	..	.....
Mobile & Ohio	Train, yard	.....	.....	60 ⁵	..	14	..	Three years cancels 50. Bulletins issued yearly, showing all perfect records.
Nashville, C. & St. L.	Train, yd., sta., M. W. foremen	.....	.....	.....	..	..	..	.....
New York Central	Train, yard, telegraph, signal.	1912	(See list B)	.....	..	..	..	.....
New York, N. H. & Hartford	Train, yard, telegraph	.....	5-45	90-100	..	6	..	Five years cancels all.
Norfolk & Western	All	.....	.....	.....	..	..	..	For one year of satisfactory service 30 merits are entered, but there is no regular balancing of merits and demerits.
Norfolk & Southern	Train, M. W. foremen.	.....	.....	No fixed number	5	30	..	.....
Northern Pacific	All in transportation dept.	.....	.....	.....	..	..	..	Actual suspension may be imposed.
Oregon Short Line	All in operating dept.	.....	.....	.....	..	..	..	.....
Oregon-Washington	Train, yd., sta., M. W. foremen	.....	.....	.. 90	5	30	60	.....
Pacific Electric	Train, yard, towerman	1912	.....	50 75 15	..	..	..	.....
Quebec Central	Train, yard	1912	.....	.. 100	..	20	..	Bulletins issued every month.
Rutland	Train, yard	.....	.....	.. 60	..	20	..	.....
St. Louis-San Francisco	Train, yard, station, telegraph.	1902	.....	.. 100	..	20	..	.....
St. Louis S. W.	All	1917	5	— 90	5	..	..	Actual suspensions may be imposed.
San Antonio & A. P.	Train, station, M. W. foremen	1908	5-30	.....	30	..	..	Bulletins issued weekly.
Seaboard Air Line	All in transportation dept.	1911	5-60	100-100	5	30	60	Actual suspensions may be imposed.
Southern	Train, yard	1897	.....	90	10	30	10	.....
Southern Pac. (Pac. System)	All in transportation dept.	1896	.....	100	..	30	..	.....
Toledo & Ohio Central	Train, yard, telegraph	.....	.....	.....	..	..	..	.....
Union Pacific	All in transportation dept.	1900	5-60	.. 90	5	30	60	Bulletins twice a month.
Virginian	(See list B)	.....	.....	.....	..	..	..	.....
Wabash	Train, yard, telegraph	1896	.....	60	10	20	30	Actual suspensions sometimes imposed.
Western Maryland	Train, telegraph	.....	.....	.....	..	..	..	Experimental; applied only in cases where suspension would be for less than 30 days.
Western Pacific	Train, yard, station, telegraph.	.....	.....	75	..	35	..	Treat involvement.
Wheeling & L. Erie	Train, telegraph	.....	.....	75-100	..	10	..	Five years cancels all demerits. Actual suspension sometimes imposed.
Yazoo & Miss. V.	(See Illinois Central)	.....	.....	.....	..	..	..	.....

² Two years, 18 marks; 3 years, 40; 4 years, 75; 5 years, clear.³ Two years, 35; 3 years, 75; 4 years, clear.⁴ And all Southern Pacific lines east of El Paso. Report says "some employees do not take the record seriously; still, the system is much better than suspensions."⁵ In one year.⁶ Also yardmasters, signalmen, engine inspectors, foremen, engine watchmen, car inspectors.⁷ Sixty, within one year, usually means 30 days' actual suspension.

4th. A clear record for four consecutive years will cancel 75 demerits.

5th. A clear record for five consecutive years will equal a clear record.

12. Dishonesty, desertion, immorality, gross carelessness, intoxication, insubordination, incivility, willful negligence, incompetency, or disobedience to the company's rules, will be considered sufficient cause for dismissal.

13. Discipline will start on an even basis, that is, without merits or demerits, except that previous record will be kept on file and taken into consideration in the case of leniency.

14. That the greatest amount of good may be realized, both to the company and employees, uniformity of merits and demerits, after considering all the conditions, will be maintained.

THE BURLINGTON PLAN

Two of the most carefully planned schemes of discipline are those of the Chicago, Burlington & Quincy and the Baltimore & Ohio, described in the *Railway Age Gazette* of June 12 and January 16, 1914. These two descriptive articles embody important testimony to the soundness of the system when it is applied with intelligence and energy. These and seven other roads are listed in the following Table B.

TABLE B.—ROADS USING MODIFIED FORMS OF BROWN'S DISCIPLINE.

Baltimore & Ohio	Detroit & Mackinac
Boston & Albany	Michigan Central
Buffalo Rochester & Pittsburgh	New York Central
Chicago Burlington & Quincy	Virginian
Cincinnati, Hamilton & Dayton	

On the Burlington the chief officers have not only maintained personal oversight of the discipline but have taken care to inform themselves of the feeling of the employees. The switchmen, at first left out, made application to be taken in; which refutes the idea that employees always prefer the old or suspension system.

Our account tells of the Burlington employees' views, and also contains carefully prepared statistical information, covering five years, showing the good results of abolishing suspensions. The operations on all divisions are recorded at a central office in Chicago and carefully co-ordinated. The Baltimore & Ohio plan was copied largely from that of the Burlington, and our description of it gives some particulars not fully elaborated in the Burlington account. On both of these roads "marks" to indicate the degree of importance attached to an offense are unknown, and there is nothing in the shape of a statistical record by which to make mathematical measurements of the good or bad behavior of individual employees.

The New York Central imposes suspensions but defers their enforcement; and if the employee gives satisfactory service thereafter for one year the punishment is not imposed. This has greatly reduced the number of men actually laid off. The Boston & Albany has substantially the same plan, but in the more serious cases does not defer the penalty. The Buffalo, Rochester & Pittsburgh and the Michigan Central have about the same. The Cincinnati, Hamilton & Dayton has the same as the Baltimore & Ohio; and the Detroit & Mackinac a similar plan but with provision for actual suspension in serious cases. On the Virginian the practice is about the same, but the regulations are being changed in some details.

THE L. & N. AND THE UNION PACIFIC

The Louisville & Nashville issues every twelve months a complimentary bulletin giving special credit to employees who have a perfect record for one year. Mention is made at the same time of any unusual acts of heroism and loyalty.

This was one of the earliest of the large roads to abolish suspensions, having adopted the Brown system in 1895. The officers employ this system because it "tends to greater efficiency and assures employees that with proper endeavor they will have regular and continuous work, even if they should make a blunder. The employees take a good deal of pride in maintaining clear records and having their names appear in the complimentary bulletin."

The Union Pacific, which has had the Brown system in use seventeen years, discontinued, several years ago, the entering of specially meritorious acts on records of employees. Under the present arrangement, "where an employee does something out of the ordinary and out of his own line of duty, a letter is usually written to him, complimenting and thanking him for his action." This is believed to be more effective and satisfactory than the common plan of entering a certain number of merits on the book records.

On the Wheeling & Lake Erie an employee whose pay is garnisheed has five demerits entered on his record; for a second garnishee, fifteen demerits and for a third, forty-five demerits. The fourth garnishee brings dismissal.

TABLE C.—RAILROADS NOT USING BROWN'S DISCIPLINE

Alabama Great Southern	Kansas City, Mexico & Orient
Bangor & Aroostook	Kansas City Southern
Central Vermont	Lake Erie & Western
Chicago Great Western	Long Island
Chicago, Ind. & Louisville	New York, Chicago & St. Louis
Cleveland, C. C. & St. Louis	New York, Ontario & Western
Colorado Midland	Pennsylvania, West of Pittsburgh
Delaware & Hudson	Philadelphia & Reading
Delaware, Lackawanna & Western	Pittsburgh & Lake Erie
Duluth, Missabe & Northern	Pittsburgh, Shawmut & Northern
Duluth, S. S. & Atlantic	Spokane, Portland & Seattle
Grand Rapids & Indiana	Texas & Pacific
Grand Trunk	Toronto, Hamilton & Buffalo
International & Gt. Northern	

a. Used Brown system; abolished long since; "actual suspensions much better."

b. Employs "suspended sentences."

c. In some cases suspensions are held in abeyance for one year.

d. In some cases suspensions are "recorded" and not served.

e. "Record suspensions" are sometimes imposed for minor offenses.

AN EDUCATIONAL BULLETIN

In administering the discipline of several hundreds or thousands of railroad employees, scattered throughout scores of towns and cities, adherence to uniform practice can be only partly successful. Even where all of the men to be dealt with are in a single city and are engaged in the same kind of work, the attainment of ideal conditions is difficult, because of the individuality of the men. Human beings who do such varied work, mental and physical, as the railroad service requires, cannot be treated as mechanical structures, all made on one pattern. The information concerning discipline which is shown in the large table is therefore not to be taken as illustrating the methods of the railroads named; it is only a sketch of the framework by which those methods are made as nearly uniform as practicable. Rigid uniformity, no doubt, would hinder rather than promote progress.

"Brown's discipline" is a phrase having a single well-known meaning everywhere; yet the carrying out of the principle involved affords ample scope for individuality. Our table is a mere index. With or without the data there given, the making of precise comparisons between one road and another is likely to be of rather limited value. But concise information about actual experiences in this field is always instructive, and the reader will examine with interest the educational bulletin of one district of the Canadian Pacific which is given below. This bulletin is for the month of January, 1917. On this road a considerable degree of uniformity is attained by the use of a schedule, by all the division superintendents, prescribing a maximum number of demerits for each of a large number of offenses.

CANADIAN PACIFIC RAILWAY.

DISTRICT.

EDUCATIONAL BULLETIN No. 79, FEBRUARY 1, 1917.

Title of Employee; Number of Demerits; Offense.

Asst. Agent, 2.....	Did not have bulletin board dated.
Sec. Foreman (3)—2.....	Did not have switch lamps burning.
Agents (2)—2.....	Delayed wired report of earnings.
Operator, 2.....	Failed to issue telegraph pass when instructed.
Train Clerk, 2.....	Billed a car to wrong destination.
Train Clerk, 2.....	Failed to submit form C S 2 for a red card load.
Asst. Agent, 2.....	Failed to brace a can of oil in car, it upset and contents were lost.
Stower, 2.....	Stowed a shipment in wrong car.
Checker, 2.....	Failed to show car on passing report.
Train Baggage-man, 2.....	Piled milk cans one on top of the other, so that one fell and claim was presented for loss of contents.
Conductor, 2.....	Failed to lift an empty car when instructed.
Agent, 2.....	Held time cheque beyond time limit and delayed correspondence in connection therewith.
Agent, 2.....	Failed to submit monthly time report, form 84.
Train Clerk, 2.....	Called engine for way-freight at 5:45 when train crew had booked rest until 7:00k.
Baggage-man, 2.....	Caused delay to baggage.
Engineer, 2.....	Started train before allowing time for brakes to release, which broke knuckle.
Agent, 2.....	Forwarded empty foreign car without obtaining instructions.
Agent, 3.....	Delayed correspondence by giving incorrect information in connection with leases in effect at this station.
Billor, 3.....	Billed a car under wrong number.
Car Repairer, 3.....	Failed to advise Engineer or Conductor that steam pressure on their train was too low.
Agent, 3.....	Delayed a commercial telegram.
Agents (39) Operators (10) Ticket Clerks (4) Asst. Agent, 5.....	Issued unstamped tickets.
Trucker, 5.....	Left in car shipment that should have been unloaded.
Trainman, 5.....	Did not properly clean snow from switch points, which derailed car.
Train Baggage-man, 5.....	Failed to see that he received all baggage for which he signed, resulting in five pieces being left.
Trainman, 5.....	Gave Conductor proceed signal before all baggage was loaded, resulting in five pieces being left.
Engineer, 5.....	Violated air brake rule 4-A by not cutting off engine when taking water.
Fireman, 5.....	Failed to report for duty on time.
Fitter's Helper, 5.....	Used a wrench that brulch with which he was tightening smoke box rim was properly adjusted. It slipped and he fell off engine, sustaining injury.
Checker, 5.....	Did not properly check and reload shipment, causing delay to destination.
Conductor, 5.....	Did not report having run through a switch.
Trainman, 5.....	Threw switch against engine, with result that it was run through.
Trainman, 5.....	Did not throw derail before allowing train to back up, which derailed car.
Trimmer, 5.....	Caused injury to himself when filling rod cups on engine, by not looking where he was going and falling into pit.
Boilerwasher's Helper, 5.....	Stepped off back of engine when he knew it was separated from tender, thereby injuring himself.
Yard Foreman, 5.....	Failed to give Engineer stop signal before switch was thrown, causing delay to engine derailed.
Car Carpenter, 5.....	Negligence in application of safety appliances.
Freight Clerk, 5.....	Misbilled a car.
Checker, 5.....	Wrongly delivered a shipment.
Baggage Checker, 5.....	Matched checks thereby causing delay to baggage.
Washoutman, 5.....	Failed to see that nozzle was incorrectly adjusted, which caused it to slip and injure him.
Engineer, 5.....	Struck car with sufficient force to cause damage.
Agents (5)—5.....	Violated rule 91 by failing to block a train.
Tender Truck Repairer, 10.....	Did fault work on goose neck of an engine.
Operator, 10.....	Put in overtime ticket to which he was not entitled.
Section Foreman, 10.....	Did not have elevator track in proper condition, resulting in derailment of engine.
Pumpman, 10.....	Allowed water to get low in tank at terminal.
Trainman, 10.....	Delayed a train by not giving notice that he was sick and would be unable to accept call.
Fitter, 10.....	Did poor work on an engine, which resulted in delay to a passenger train.
Trainman, 15.....	Did not properly protect movement of engine of which he was in charge with result that it corched and damaged caboose of another engine.
Engineer, 15.....	Did not have engine under proper control when coupling to train and struck caboose with sufficient violence to cause damage.
Section Foreman, 15.....	Failed to carry out instructions regarding shimming rough track and repairing a switch.
Section Foreman, 15.....	Allowed his hand car to be struck by a train.
Signalman, 15.....	Delayed train at a diamond crossing.
Yard Foreman, 20.....	Poorly supervised switching operations with result that engine and three cars were derailed.
Agent, 20.....	Failed to carry out instructions with regard to telegraph service. (Second offense.)
Pumpman, 20.....	Failed to drain boiler which froze and was damaged.
Yardman, 30.....	Failed to promptly give stop signal when he saw that cars were coming too fast, resulting in derailment.
Engineer, 30.....	Caused damage by starting engine without signal.
Yard Foreman, 30.....	Blocked traffic track during severe weather without giving reasonable warning to approaching train and poor judgment used in choice of track, with result that train struck yard engine and did considerable damage.
Section Foreman, 30.....	Failed to see that his men had proper flagging equipment when changing rail.
Pumpman, 30.....	Allowed pump to freeze.
Engineer, 30.....	Failed to observe signals set against him at interlocking tower, which resulted in derailment.

Engineer, 30.....	and reduced to freight service for twelve thousand miles for striking rear end of a train that was standing at terminal.
Conductor, 30.....	and reduced to permanent yardman for exceeding the speed limit and not clearing a superior train by the prescribed time.

Employees Dismissed.

Agents (3).....	Mishandled the Company's funds.
Operator.....	Refused duty.
Engineer.....	Allowed engine to get short of water causing crown bolts to leak and engine to give up train.
Trainman.....	Threw switch in front of a moving train which resulted in damage to equipment. He later appeared for investigation in an intoxicated condition.
Operator.....	Refused to assist with clerical work at station.
Fireman.....	Failed to report for duty after accepting a call.
Car Repairer.....	Did not properly attend to coach, allowing steam pipes to freeze and burst.
Agent.....	Did not carry out instructions and made false statements at investigation.
Yardman.....	Was convicted of theft in Police Court.
Trainman.....	Violated Rule G.
Trainman and Fireman.....	Failed to produce testimonials.
Trainmen (2), Fireman, Yardman and Operator.....	Previous record.
Fireman and Wiper.....	Deserted the service.

Meritorious Service; Five Merits Each.

Yardmen (3).....	Prompt action taken in preventing fire from spreading.
Engineer.....	Crawled inside ashpans of his engine and fixed grate, thereby avoiding engine failure.
Trainman.....	Fired engine when regular man was injured.
Agent.....	Took prompt action to protect Company's property when elevator burned.
Trainman.....	Discovered broken arch bar.
Engineer and Fireman.....	Took prompt action to get from terminal to a nearby station to protect Company's property when elevator burned.
Trainman.....	Assistance rendered during severe blizzard by passing coal on passenger engine.

Records Cleared by 12 Months' Satisfactory Service.

Agents.....	3	Car Carpenter.....	1	Siv. Boiler Fireman.....	1
Boilerwasher.....	1	Car Inspector.....	1	Sectionman.....	1
Boilermaker.....	1	Engineers.....	5	Signalman.....	1
Car Repairers.....	3	Fitters.....	3	Trainmen.....	3
Checkers.....	3	Firemen.....	2	Wipers.....	5
Clerks.....	3	Fitter's Helper.....	1	Yard Foreman.....	1
Conductors.....	4	Operators.....	2	Yardman.....	1

Employees From Whose Records Twenty Demerit Marks Have Been Deducted for Twelve Months' Satisfactory Service.

Agent.....	1	Engineer.....	1	Operator.....	1
Conductor.....	1	Fireman.....	1	Trainman.....	1
Craneman.....	1	Hostler.....	1	Yardman.....	1

Miscellaneous.

On January 7 during a severe blizzard, Conductor M. found a cart loaded with coal standing foul of the crossing on the opposite track one mile west of P., stopped his train and prayed for a passenger train on the other track, thus preventing possibility of an accident.

We are continuing to have too many injuries on account of shopen, trainmen and others being careless of their personal safety in the performance of their duties, and incurring unnecessary risk.

The prevailing severe weather calls for the utmost care in operating trains and switching; it is much the better course to look ahead and prevent accidents rather than deplore them after they occur.

Trainmen, trackmen and all employees handling or placing torpedoes must use the utmost care in placing or using them. The utmost care and caution must be exercised to prevent torpedoes being left on the ground unexploded.

FRENCH RAILWAY UNIONS.—Subject to final ratification, plans have been made to amalgamate the principal French railway trade unions. If these proposals are carried into effect the result will be the creation of a great and very powerful union, with a distinctly militant policy. The name of the new society is to be the "National Federation of Railway Workers of France, Colonies, and Protectorate Countries," with headquarters at Paris, and it will be affiliated with the notorious "C. G. T." (General Labor Confederation), which provoked the great postal and railway strikes. The weapon of the general strike would also seem to be one on which the new federation is placing considerable reliance. Its proposed articles of association provide for the constitution of a "General Strike Committee" of 24 members, to be elected annually, and immediately after its establishment, this committee is "to elaborate a plan to be ready for any eventuality." No strike is, however, to be declared, save on the votes of five-sixths of the committee. It remains to be added that women are eligible for membership of the National Federation, but at lower subscription rates than their male colleagues.—*Railway Gazette, London.*

DESIRABILITY OF STANDARD LENGTH FOR STOCK CARS

By C. E. Smith

The advisability of adopting a standard length of stock car to facilitate handling at the yards is a matter worthy of some attention, and the description of the recent Santa Fe stock car in the *Railway Age Gazette* of June 1 suggests a consideration of the subject at this time.

At isolated points where stock is loaded in one or a few cars at a time the extra burden of switching cars of various lengths to place the doors opposite the gates of stock pens may not be great, but the extra switching, the time consumed and the general confusion resulting from the handling of trains of stock cars of miscellaneous lengths alongside long loading and unloading chutes at stock yards is a source of trouble and expense. Coordinate with the consideration of a standard length for stock cars consideration must be given to a standard spacing for loading and unloading chutes. If standard dimensions are adopted for future stock cars and also for future stock chutes conditions will gradually reach the point where solid stock trains can be handled at long unloading chutes without the necessity of separating the trains into small cuts.

In the design of new facilities at the Kansas City stock yards the writer after careful investigation adopted a 44-ft. spacing of stock chutes to fit a standard length of car of 40 ft. (inside dimension). The tendency for cars to approach that length seemed also to warrant such a choice. The length chosen is considerably greater than the majority of stock cars now in service, but harmonizes with the length of many of the most recent designs. The 44-ft. chute length was chosen for the additional reason that cars of shorter length than 40 ft. can be separated in cuts of four or five and spread to bring the doors opposite the gate of the chutes. This practice is impossible when the car lengths are greater than the spacing of the chutes.

At the Kansas City stock yards stock loading and unloading facilities will consist of five tracks of about 60 car lengths. The width of each chute is 22 ft., that is, one half the length of a car, coupled, making a total of 120 chutes on each side. The double chute arrangement was chosen in order that both floors of a double deck car might be unloaded into two adjoining chutes at one time, and also in order that a second train of single deck cars might be unloaded in alternate pens before the first pens, filled by a preceding train, had been emptied.

In the table below are given summaries showing the number of each length of stock car between 32 ft. and 41 ft., together with the total number of stock cars of greater or less length.

Summary of stock cars by length and number:

Length	Number
Under 32 ft.	1,365
32 ft.-33 ft.	6,164
33 ft.-34 ft.	2,306
34 ft.-35 ft.	59,688
35 ft.-36 ft.	59,990
36 ft.-37 ft.	37,188
37 ft.-38 ft.	12,130
38 ft.-39 ft.	2,232
39 ft.-40 ft.	8,487
40 ft.-41 ft.	2,775
Over 41 ft.	677
Total	138,472

In each case where the car length is given the dimension is that inside the body. The dimension between the pulling faces of the coupler knuckles will be about 4 ft. greater. The slight variation in this dimension would be compensating and should have but little effect on the spacing of the car. It will be seen that there are quite a number of cars more than 40 ft. long, but the only ones which would cause serious trouble in handling at 44 ft. chutes built for a 40-ft. car are 650 stock cars with an inside length of 44 ft.

owned by the Great Northern. On account of the fact that these cars exceed in length practically all other stock cars and since these cars seldom if ever reach Kansas City, it was not thought necessary to space the stock chutes to accommodate them. However, at points served by the Great Northern or connecting lines, it would not be advisable to build chutes with a spacing adapted to the handling of these cars as the number of shorter cars so far exceeds the longer cars that the extra switching in the handling of the shorter cars at the longer chutes would more than offset the greater facility in the handling of the comparatively few longer cars.

The adoption of a standard length of stock car and a standard spacing of chutes to fit the stock car would be very desirable. From the information at hand it would seem that a length of 44 ft. would be the best to adopt as a standard for stock chutes and 40 ft. inside length for stock cars.

RAILWAY EMPLOYEES NOT EXEMPT FROM DRAFT

Railway employees as a class are not to be exempt from conscription into the National Army. Rules and regulations prescribed by the President for the local and district boards who are to pass upon claims for exemption from the draft were issued on Monday, in a booklet of 84 pages, which makes no mention of railroad transportation service. Under the provisions of the act, the President is authorized to exclude or discharge from the draft, or draft for partial military service only, from those liable to draft "persons engaged in industries, including agriculture, found to be necessary to the maintenance of the military establishment or the effective operation of the military forces or the maintenance of national interest during the emergency," but in the regulations and instructions to the local board, no mention is made of railway service as an industry thus found to be necessary.

The railroads have been endeavoring for some time to ascertain the government policy with regard to railway employees and have been advised that the question as to who shall be exempted, excluded or discharged from the draft is a question for the determination of the federal exemption board, who will operate under the provisions of the selective service act, and will be guided in their determination by the rules and regulations issued by the President. There are practically no exemptions by classes provided in the regulations, except as provided by the law for such classes as government officers, ministers of religion, students of divinity, persons in military and naval service, subjects of Germany and other resident aliens who have not taken out their first papers. These may be exempted by the local boards, who may also discharge county and municipal officers, custom house clerks, persons employed by the United States in the transmission of the mails, artificers and workmen employed in the armories, arsenals and navy yards of the United States, persons employed in the service of the United States designated by the President to be exempted, pilots, mariners actually employed in the sea service of any citizen or merchant within the United States, and those in a status with respect to persons dependent upon them for support which renders such exclusion or discharge desirable.

The government takes the position that the percentage of men selected from any one industry will be so small as not to interfere with the operation of any industry and as it is not the intention to cripple any industry, the exemption boards will have authority to make exemptions in individual cases in industries found to be "necessary."

Exclusive original jurisdiction is conferred upon the district boards to hear and determine all questions or claims for exempting or excluding or discharging persons, arising under the provision of the act authorizing exemption of persons engaged in industries found to be necessary. A

claim for discharge under this provision of the act may be filed with the district board by, or in respect of, any person whose name has been certified to the district board by a local board as one called for service and not exempted or discharged. Claims for discharge must be filed with the district board on a form provided for that purpose on or before the fifth day after the mailing by a local board of notice to such person that his name has been certified to the district board as called for service and not exempted or discharged. The regulations provide that to warrant exemption not only must the particular industry be necessary to the maintenance of the military establishment or to the effective operation of the military forces or to the maintenance of national interest, but that the employee's continuance therein is necessary to the maintenance thereof, and that he could not be replaced by another person without direct substantial material loss and detriment to the adequate and effective operation of the enterprise, and that the particular enterprise is necessary. The President may, however, in his discretion, from time to time ascertain and determine which industries or classes of industries are necessary and certify his findings to the district boards.

It is made the duty of each district board to ascertain by its own methods existing conditions in industries as they may be affected by the draft and to ascertain as near as may be the labor supply available for necessary industries and to take into consideration all such effects in determining claims, and the effect of the efforts of government agents to mobilize and make such labor more efficient.

If in the opinion of the district board the direct substantial material loss to any industrial or agricultural enterprise outweighs the loss that would result from the failure to obtain the military service of any such person, a certificate of discharge may be issued.

B. & O. OFFICERS' ANNUAL MEETING

The annual general staff meeting of the Baltimore & Ohio was held at Deer Park, Md., June 29 and 30. About 500 were present. Vice-president A. W. Thompson presided on the first day and George H. Campbell, assistant to the president, acted in that capacity on the second day, taking the place of Vice-President George M. Shriver, who was unable to be present.

President Daniel Willard delivered a eulogy on the late Chairman Oscar G. Murray, telling of his service to the company and his charity. Mr. Campbell, who is executor of the will of Mr. Murray, said that the sum applicable to the Oscar G. Murray Railroad Employees' Benefit will exceed \$800,000.

Mr. Willard also delivered a stirring address on the war situation. He said, in part:

The success of America and our Allies in the war for liberty and democracy depends largely upon the efficiency of this country's transportation system. Every American stands on the same footing of patriotic citizenship, with every man occupying one of two positions in respect to the war. He is either for his country or he is against it. The aims of effort of every citizen must be brought into play if the goals for which America cast its die in the world war are to be realized. Every phase of the railroad service must be considered with reference to its bearing on the winning of the war. With the potential fighting strength of our Allies, and the moral support of America and its vast resources and military forces, it is inconceivable that our efforts will fail to be crowned with victory. The government rightly expects every man, woman and child to render a faithful account of their citizenship and everything should be subordinated to patriotic action.

The War Board, with full authority to handle troops and articles entering into the manufacture of war supplies in the

best interest of the government, and sitting before a map outlining 262,000 miles of railway lines whose corporate identity has been removed, is directing the movement of food-stuffs required by the American people and our ally fighting forces abroad; and if a shortage of fuel threatens any section of the country the combined facilities of the railroads will be directed towards relief. The service necessary to the winning of the war will require 75 per cent of the capacity of the carriers, leaving but 25 per cent capacity to perform a business service which normally requires twice that effort.

The French railroads are now badly in need of rehabilitation. Russia is badly in need of more and improved railroad service, locomotives and cars. While locomotives are being built here for Russia, France and England, the American railroads have agreed to withhold orders so far as possible. Russia's fuel supply which formerly came largely from England through Archangel to Petrograd—the industrial center of the empire, is now being shipped there from the Caucasian mountains, a distance of 1,500 miles. Vladivostok is now the front door to Russia, it being the terminus of the trans-Siberian railroad.

The acreage under cultivation in America this year is 30 per cent greater than last year. The railroads have co-operated in handling seeds and farming machinery and every effort will be made to move the crops promptly. The Baltimore & Ohio is handling 20 per cent more business with a decrease in the percentage of train miles. This has been accomplished by increasing the average trainload to 800 tons. I believe the people are going to appreciate the situation confronting the carriers when they see how they have come to the front and what they have done to meet the national emergency and there will be a disposition everywhere to give the railroads what they fairly deserve.

J. M. Davis, vice-president in charge of operation and maintenance, presided at the afternoon session. Plans for offsetting the increased expense incident to the Adamson law, relief of freight congestion, car supply and the welfare of employees were discussed.

On the closing day President Willard made a brief address appealing to industrial America to preserve the standards of womanhood during the emergency which has made it necessary to place female operatives in positions formerly occupied by men.

If it should come about that our American womanhood suffered indignities as a reward of the patriotic effort they are making to support the nation in the purposes of this war, we in America would be in a sorry plight for we would thus be confronted with a situation the seriousness of which would be second only to the losing of the war. * * * I have seen women in the various countries of Europe doing the roughest of work in the mines, in the fields and in industrial pursuits; but Americans have prided themselves that women occupied a nobler place in the code under which we live. American women are to be commended for stepping into the industrial gap created by the retirement of men answering the call of the country to arms. These women must be encouraged and the conditions of their employment must be made as agreeable as possible.

The Baltimore & Ohio has more than 1,000 women in its employ filling places vacated by men. "Their entry into the ranks of transportation employees must be taken seriously," said Mr. Willard, "and while it is somewhat early to predict all that women will accomplish we do know that they are rendering a good account to their employers. We shall see to it on the Baltimore & Ohio that they are taken care of, that they have opportunities to live up to their traditions and that their comforts are provided for without the slightest embarrassment." The Baltimore & Ohio Glee Club of 40 voices, under the direction of Hobart Smock, gave a concert at the closing session on Saturday evening.

An Attractive Reinforced Concrete Highway Viaduct

Lackawanna Bridge at Clark's Summit Involves a Number of Interesting Features of Design and Construction

THE Delaware, Lackawanna & Western recently completed a reinforced concrete bridge over its tracks at Clark's Summit, Pa., which has a total length of 390 ft. and a width over all of 31 ft. 9 in. It consists of six 50-ft. and two 45-ft. concrete deck girder spans. Space is provided for a clear roadway of 24 ft., a 5-ft. sidewalk on the west

crete columns which in turn rest on concrete pedestals. The T-beams are stiffened over the bents and at the center of the spans, by transverse struts cast monolithic with them. At every third span a double column bent was used to provide for contraction and expansion of the floor, depending upon the flexibility of the columns to take up the movement. This is a feature of the design and is more satisfactory in long spans than sliding joints, while it eliminates the necessity for transverse beams connecting the columns. Between these expansion joints the girders are continuous over the supports and are designed as continuous beams.

In the T-beam floor, each beam is supported directly on a column so proportioned as to be just within the limits of the ratio of slenderness requiring the diameter of the columns to equal $1/15$ of their height. The beams have a curved soffit, giving a pleasing architectural effect and counteracting the sagging at the center appearance common in beams of long spans when built level or on a straight line. The increased depth of the beams at the columns provides for the diagonal tension and the negative moment at the support where the T-beam effect is lost.

CONSTRUCTION

By referring to the photograph showing the completed bridge it can be seen that the tracks were placed in a cut at this location. In preparing the site for the structure, the knoll between the main line tracks and the westbound slow track was taken out by a steam shovel. The two bents on the left or north are founded on rock that was found close to the surface and the others rest on an earth foundation. In the latter case, the footings were designed for three tons per square foot.

The footings were not placed at the same level and in order to make the column lengths the same for the 50-ft. spans, thus permitting the re-using of forms, pedestals which carry the columns were built up to the proper height. The pedestals on each side of the main track, which act as a



Placing the Reinforcement in the T-Beams and Floor Slab

side and the concrete railings. The bridge spans the three main tracks of the new line recently completed by the Lackawanna as well as the westbound slow freight track and one track of the old line which was left in place as an entrance track to the Clark's Summit freight house.

The bridge floor, which is the T-beam type was designed



The Completed Viaduct

for a live load of 100 lb. per sq. ft. or a 10-ton roller plus 25 per cent impact for both. The girders are 1 ft. 6 in. wide, spaced 4 ft. 6 in. face to face with variable depths and are covered by a floor slab 8 in. thick spanning transversely.

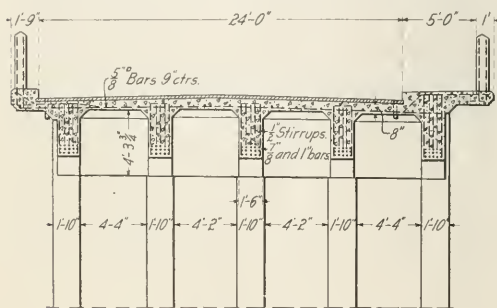
The sub-structure consists of bents built of reinforced con-

crete columns which in turn rest on concrete pedestals. The T-beams are stiffened over the bents and at the center of the spans, by transverse struts cast monolithic with them. At every third span a double column bent was used to provide for contraction and expansion of the floor, depending upon the flexibility of the columns to take up the movement. This is a feature of the design and is more satisfactory in long spans than sliding joints, while it eliminates the necessity for transverse beams connecting the columns. Between these expansion joints the girders are continuous over the supports and are designed as continuous beams.

In placing the falsework during the construction it was essential to span the main tracks without placing a support between tracks. For this reason old steel trusses were

brought in and used to support the centering. The forms for the columns were braced to the bents which carried the trusses. In the double column bents the space between columns is only $1\frac{3}{8}$ in. The columns were poured simultaneously and the form between the two consisted of two beveled boards which were wedged in place. To facilitate the removal of the forms the wedge was started just after the completion of the pouring. With the wedge started no difficulty was encountered in removing the forms.

In placing the concrete floor, the run was continued without interruption for three spans or between expansion joints for one-half the width of the bridge. The bridge is on a 3 per cent grade and the floor is drained through $2\frac{1}{2}$ -in.



Cross Section of the Floor

wrought iron pipes spaced 10 ft. apart. The floor is paved with 3 in. of asphalt which provides the necessary waterproofing.

The concrete plant was located at the track level and a tower was provided for elevating the concrete to the forms. The 45-ft. spans were built first and after their completion were utilized as a site for precasting the concrete fence panels. The concrete railing was erected by placing the panels and pouring the posts in place around the panels which project 3 in. into the posts. The bridge was built by the company's forces under the direction of G. J. Ray, chief engineer of the Lackawanna, and L. L. Tallyn, division engineer. A. B. Cohen was in charge of the design.

THE TRAIN DESPATCHER'S PART IN THE WAR

By C. J. McDonald*

By the organization of the Special Committee on National Defense of the American Railway Association (its "War Board") we have in reality a continental railway system. One railroad, under one management, one set of tracks, one lot of power and equipment, and greater than all, just one purpose. . . . The Commission on Car Service, acting under the War Board, is in continuous session at the Washington headquarters. It is directing the movement of equipment; regulating embargoes and release of cars, and at all times is keeping in close touch with the whole situation, changing as it does from day to day. . . . The Government will not, like that of England or Germany, have a separate branch of its organization conduct the system of transportation, but rather the United States Government has, ready for use, a system of railroads that has become so proficient that it is furnishing the highest class of freight and passenger service in the world.

Will our great American Continental Railroad uphold the honor of the greatest railroad system in the world? It

must and it will. The railroads are keenly appreciative of the opportunity to demonstrate to the country at large the value in time of war of railroads with elastic management. The railroads of this country are on trial. It is up to you, and it is up to me, and it is up to every single individual employee to see that this continental system does not fail. It can not fail; the very life of our nation depends upon the success of the government. The time-worn phrase "An army travels on its stomach" has been brought up-to-date by General Joffre's remark, "An army can progress only as its railroad facilities permit."

What can the train despatcher do? You can do a great deal. Your part in the war is right on your job of handling trains. The train despatcher is the superintendent's lieutenant. You will by far serve your country better and more effectively on your job than you would by actual physical fighting in the trenches. You are going to handle the greatest volume of tonnage in history; every car is going to be of the highest importance. There is only one thing to do, gentlemen; we must change our standards, change the breadth and width of a day's work for a freight car. Instead of handling only 16 tons, one car must carry twice the volume. You must speed up that car so that it will move faster. It moves fast enough when it is moving, but you must cut out lost motion. . . . Get trains moving out of the terminal right on the call, keep them going; figure your meets just a little closer; see that passing tracks and sidings are kept clear, and don't let your trains get caught outside of terminal by the legal limits. Do your part, and do it just a little better than you have ever done it before.

The keynote of success is train loading. You have done well in train loading, very well, but with the future in prospect, you are going to have to materially increase that train load; it simply must be done. None of us have locomotives to spare and there is just one thing to do—increase the day's work for the power we have. I have asked you to see that every engine on your division makes more than 75 miles a day. The nearer you come to actually doubling that daily mileage the better, but your efforts are not going to be very successful unless you accumulate that mileage with tonnage. Increase the train load just as much as it can be done.

Your roundhouses and your shops are going to become more efficient; they are going to give you engines that are steaming better, engines that are not leaking, engines that can do a full day's work any time they show up for call. The shop forces are just as anxious to contribute their efforts as you are. But the work that an engine does is entirely up to you, Mr. Despatcher. You are the one who can handle company material on trains that could not otherwise handle full tonnage; you are the one who will handle the company coal or company oil so as to fill up storage points at odd times without interference with regular traffic.

The War Board may even ask for a number of your engines to be turned over to another railroad. Some of these orders you may not understand, but if you will comply fully and promptly with all of them, you may rest assured that you are helping the whole situation. Suppose you get an order to deliver ten engines to your neighbor, or fifty coaches, or something like that. You know that he already has more equipment than you have; but the thing you don't know is that he may have a great military movement. . . .

. . . You know that our newspapers are not printing troop movements, and realizing the crafty enemy with which we have to deal, you also know how necessary it is to surround troop movements with secrecy. The despatcher must, of course, know all about such movements; the curious public is going to try to find out from you the details. Keep this in mind. Protect the troop movements the way our government wants them protected, by not letting information that may have harmful effects get out. Tell this to your train crews, too; they realize the harm that may come from information on troops getting out and they are glad to help.

* From an address delivered before the Train Dispatchers' Association, at Fresno, Cal., June 20. Mr. McDonald is assistant superintendent of transportation of the Southern Pacific, Pacific System, and also assistant to the chairman of the Western Department of the Railroads' War Board.

RAILWAY BUSINESS ASSOCIATION

"Our committee recognizes that commodities differ and that in some cases cubical capacity and weight capacity of the car are not equal. Shippers who are really interested in our proposed economy will naturally order of each commodity a quantity that is a full load of that commodity in a car of given weight capacity, and test performance by that standard.

"Already car shortage has yielded to co-operation. The authorities at Washington, the Railroad War Board and the National Industrial Traffic League through appeals have aroused the enthusiasm and zeal of shippers. The danger is that preoccupation of executives with other matters and the natural tendency of verbal instructions to fade from the mind of the employee will permit a return of laxity. We hope that by installation of a routine such as we recommend

"'Waste by any one of us in any sphere is aid and comfort to the enemy.'"

SHORT LINE RAILROAD ASSOCIATION OF THE SOUTH

The Short Line Railroad Association of the South of which Bird M. Robinson, receiver, Tennessee Railway, Oneida, Tenn., is president has issued a circular headed "Loading Uppers of Freight Cars." The substance of the circular follows:

There is an enormous waste of car space yet to be corrected and it behooves each member line of this association, not to deliver to its connections any car unless it is loaded to the maximum.

You are urged to impress upon shippers the importance of this matter, and get them in turn to take up with consignees and consumers and get them to order full carloads of commodity regardless of minimum.

You will find it helpful to examine the capacities of cars and check the loading, and by reducing same to percentages see how near you are getting to maximum efficiency in this regard. It is quite possible that the manner in which we load cars to our connections may have a bearing upon the number of cars made available to us.

In the present crisis the passenger departments of trunk lines are agreeing to refuse extra sleeping cars, until all the uppers are sold. Let us fill the "uppers" of freight cars by utilizing every inch of car space available and thereby do our bit to win the war.

TRANSPORTATION FACILITIES FOR FARM PRODUCTS

The Bureau of Markets of the Department of Agriculture has recently issued the following bulletin on the importance of heavy loading: "The U. S. Department of Agriculture daily receives from producers and distributors complaints of inadequate transportation facilities and appeals for assistance in securing cars.

"The Executive Committee of the Special Committee on National Defense of the American Railway Association, under whose direction the operation of all of the railroads of the country is being co-ordinated in an effort to produce a maximum of national transportation efficiency, is endeavoring to secure from the railroads the most efficient use of cars.

"The trade practice of placing an order for the tariff minimum weight of a given commodity is difficult to change in some cases, and it is recognized that small markets in many cases can not take a maximum carload of certain commodities, but there are many ways in which shippers and distributors can get more work out of a car at the present time.

"Shipping associations can pool the output of all their members and load cars of some commodities to full capacity for large markets. Wholesalers and carlot distributors can place orders for carloads of a greater quantity than was customary in the past. Shippers should load and unload cars within the shortest possible space of time, and every individual having to do with the diversion of cars in transit should reduce delay at diversion points to the lowest possible minimum. Against the increased value of a better market found while holding a car in transit must be balanced the loss due to deterioration of the product while the car is held and the sometimes greater loss of another shipper whose product spoils for lack of the car which the first shipper is holding.

"Cars, packages, commodities, time in transit, and seasons are variable, and the department has no accurate data from which rules can be laid down as to the exact quantity of a given commodity of a certain degree of maturity which can be loaded into a given car for a definite haul to a particular market; but potatoes in strong, double-headed barrels loaded in well-ventilated box cars for destinations that can be reached within three or four days could be loaded safely considerably beyond the prescribed tariff minimum weights. Citrus fruits in many cases can be so loaded. Apples, espe-

cially when moving to storage points in the late autumn, should be loaded to the space capacity of the car. Laredo onions normally are loaded 464 crates to the car. Cars were very scarce for the abnormal crop of the present year and they were loaded as high as 800 crates to the car. It is well known, however, that the Texas onion crate is so constructed as to secure the maximum of ventilation in loaded cars. The fact that loading watermelons five deep instead of four would reduce the number of cars necessary to move the crop by one-fifth, makes the experiment worth trying. A liberal use of straw underneath and between the melons, instead of merely sawdust underneath, and placing the larger melons at the bottom of the load would seem to make the plan feasible.

"What has been said relates to perishable commodities. The case is simpler with nonperishables. Association users of fertilizers, packages, and package material should order cars of full maximum capacity loading whenever possible. Buyers and users of cotton could assist by ordering in lots of 100 bales instead of lots of 50 bales.

"The present is a time for the closest co-operation of all interests for the most efficient utilization of cars and not a time to discuss relative responsibility for car shortage. One car used with the risk of damage from overloading is better than total loss of the commodity for lack of the one car in which to ship."

The Bureau of Markets is also co-operating with the railroads by bringing to the attention of shippers the importance of avoiding delays in unloading cars. Last week the bureau sent a telegram to all stations on its eastern and western circuits, embracing 20 important cities, stating that a serious shortage of cars for the handling of the cantaloupe crop is threatening the Imperial Valley in California and other western points where exceptionally large crops are waiting to be moved. It is stated that the loading in Pacific Fruit Express cars from California on June 23 and 24 totaled 897 cars, which is unprecedented, but that Pacific Fruit Express officials advise that the average detention of cars at the principal eastern markets during the month of May, after cars had been placed on the team track for unloading, was four days. There was also some delay caused by shippers holding cars in outer yards for disposition. The bureau stated that receivers in all markets should co-operate with shippers and carriers in this extreme emergency by unloading all cars promptly, thus making them available for further use. Somewhat similar telegrams were sent to the various organizations of fruit jobbers asking them to bring the matter to the attention of their members.

THE SECOND SIMPLON TUNNEL.—It was originally estimated that the second Simplon Tunnel would be opened to traffic on May 1, 1918, when the double track was to have been laid on Italian territory so far as Domo d'Ossola, or even beyond, but the war has so interrupted the work that it is impossible to give an approximate date at the moment. The Swiss military authorities suspended all work at the northern end from August 22, 1914, until February last, and although the works at the southern end have never been interrupted, Italy's entry in the war materially reduced the number of workmen. Moreover, those available are all under 18 or over 42. By the end of last year 6.2 km. (3.85 miles) had been bored at the northern end and 7½ km. (4.66 miles) on the southern section, leaving 4½ km. (2.8 miles) still to be excavated. Assuming the present rate of progress to continue which is largely dependent on external circumstances—the northern section might be finished by the end of the present year and the southern portion at the end of August, 1918. After that a great deal of work would still remain to be done in the shape of track-laying and ballasting, laying the electric cables and telegraph and telephone wires, signalling and lighting.

TRAIN DESPATCHERS' ASSOCIATION

The thirtieth annual convention of the Train Despatchers' Association of America opened on June 19 at the Hotel Fresno, Fresno, Cal. The weather was excessively hot all the week, but it was not unbearable even at the maximum temperature of 107 degrees F. Victor J. Imhoff, chief despatcher of the Santa Fe at Fresno, presided at the opening session. Mayor W. F. Tuomey welcomed the delegates and was responded to by President Frank T. Felter of the association. There were 42 members present at the opening; 26 applications for membership were presented and 23 applicants were elected, most of them being present. The total registration, including wives, was 116, or about half the number usually present, this because of the difficulty of relieving men at this time.

The report of Secretary J. F. Mackie showed total receipts of \$3,091 and disbursements \$3,599. The debit balance from the previous year was \$93, so that the year's operations showed a present debit balance of \$601. The statement of membership showed a large number of lapses. There was some discussion as to the cause of this. Frank N. McPhee (Southern Pacific), attributed it largely to the fact that despatchers generally failed to realize the value to them of the association, which had done much to enhance their important position in the service and to increase the consideration in which they were held; but this is being done quietly and without ostentation and is not appreciated. Mr. McPhee believed that if despatchers could have one day of rest in seven, where now, as a rule, they work continuously, day after day, for 365 days in every year, less two weeks' vacation, in a vocation requiring unusually intense application, with no meal hour within their eight hours of duty, the service would be improved through the superior energy brought to bear on the work, with the recuperative effect of the one day of rest in seven restoring mental and bodily vigor.

C. J. McDonald, assistant superintendent of transportation of the Southern Pacific, who had been delegated to represent President Sproule of that road at the convention, made an address on what train despatchers will be called upon to do during the war crisis. This address is noticed in another column.

On Wednesday Howard Elliott, Inspector of Transportation of the Los Angeles & Salt Lake, addressed the convention on "Taking Railway Legislation by the Forelock," in which he advocated preparedness to combat legislation adverse to railways, by railway men of all ranks, thus creating the public opinion which stands behind all legislation and supports or discountenances it. Mr. Elliott was warmly applauded and was given a rising vote of thanks. His address will be found on another page.

DISCUSSION ON RULES

The Train Rules Committee presented no report, lacking a quorum, but W. T. Quirk, Inspector of Transportation of the Santa Fe Coast Lines, submitted a series of questions for discussion, which discussion occupied the most of the afternoon of Wednesday and the forenoon of Thursday:

(1) Should standard marker lamps on semi-automatic interlocking signals be made purple instead of red, in order that engineers need not have to pass a red signal in automatic territory? Subject left with committee on train rules.

(2) A suggestion has been made proposing co-operation or union between the present joint train rules committee of this and the Superintendents' Association and the like committee of the Electric Railway Association, in order to the production of a code of train rules and order forms which should cover the requirements of both. The opinion of the convention was desired. The convention approved of conference with the Superintendents' Association and the Electric Railway Association on the subject by the train rules committee.

(3) A suggestion that Rules 210 and 211 be revised by requiring operators to underscore each word and figure on the lowest copy as first operator repeats. Mr. Mackie suggested that each operator except the one first repeating be required to give the "Q" response, certifying to the underscoring. The convention approved the suggestions.

(4) Two orders were submitted (A) "Eng 85 run psgr extra leaving A June 18 as follows with right over all trains except first class trains. Leave A 7 am arrive Z 2 pm." (B) "Eng 86 run psgr extra leaving Z June 18 as follows with right over all trains. Leave Z 1 pm arrive A 7 pm." It was decided that these were improper orders as regards the two trains running under them.

(5) The question was asked, "Why was Example 3 of Form G dropped from the Standard Code?" No one knew. This example was by all despatchers considered very useful, free from hazard, if properly used, and in some form practically necessary.

(6) Mr. Quirk said he understood it is becoming the practice of some roads to include in the rules that train men are not required to observe the indication of the train order signal but that that is up to the engineer and fireman.

No member present knew of any such rule. On all roads represented, conductors were held equally responsible with the engineer in the observance of signals.

(7) As to permanent slow order boards: How many lines use permanent slow boards at bad curves, bridges, etc., and if more than one curve or bridge close together, how many are used; one for each curve or bridge or one to cover a series of these or other conditions? Or, is the matter governed by special time-table rules, and, if only one board is used for a series of curves, etc., how would engineers know when they had passed out of the slow territory? Is there a "Resume speed" board in connection with slow board?

Mr. Hughes said the Sunset lines (Southern Pacific) used a permanent slow board placed on engineer's side and a green board indicating "Resume speed" when out of slow territory.

Mr. Felter: The New York Central sometimes places as many as three separate slow orders on one permanent board, prescribing the reduction of speed necessary in each case.

(8) The question was asked "What methods have been adopted by your road to facilitate the movement of trains through yards? Do you relieve conductors of checking car numbers, getting waybills and all that? Responses indicated that many roads have yard clerks to check car numbers and get way bills ready for conductors. Responsibility for error in such cases falls upon the yard force. The Illinois Central and the Southern Pacific use this system. A resolution was adopted and sent to the Superintendents' Association recommending simplification of conductors' reports.

(9) Question: What methods, if any, have been adopted to insure that conductor gets all the orders he signs for? It developed that on some roads the despatcher checks orders, by numbers, with the operator before their delivery. Others check clearance cards, the despatcher giving his O. K. and recording the check. Mr. McPhee said his road (S. P.) required trainmasters, assistant superintendents and superintendents to make tests on engineers and conductors to see that they have orders for every number of order shown on clearance cards.

SUNDAY WORK

Hugh McPhee, commercial superintendent of the Western Union at Los Angeles addressed the convention on Thursday afternoon. Mr. McPhee is a former despatcher and is an honorary member. He told of the Western Union's welfare work. Employees have the eight-hour day, based on 26 days a month, with a vacation week to those in service for one year and of two weeks to those in service for two years or more. Men are relieved of Sunday work in all departments after 1 p. m. wherever possible. Operators have

airy rooms in which to work and the company divides with them all of the funds earned over six per cent in addition to various sick and disability benefits. The Western Union has found it more economical and productive of more efficiency to keep its employees well by shortening hours of work and granting these other privileges. He had no doubt that more liberal rest would materially increase the efficiency of dispatchers.

Adopting the report of a committee appointed to frame resolutions on Mr. McDonald's address, the convention adopted resolutions pledging devotion to the cause of our country and to unremitting effort to attain every possible efficiency in that branch of railway service in which dispatchers are engaged.

Secretary J. F. Mackie, in line with the discussion at the first session, offered a resolution in favor of the establishment of one rest day in each week, as conducive to greater efficiency during the remaining six days. This was adopted, and the officers of the Association were empowered to lay before the managements of the railways of the United States and Canada "such representations as may result in securing for their dispatchers one day of rest in each week without loss of pay."

The following officers were elected for the ensuing year: President, Frank N. McPhee (So. Pacific), Bakersfield, Cal.; vice-president, Lee Rice (Southern), Greensboro, N. C. Grand Rapids, Mich., was selected as the place of meeting next year and June 18 as the date. The following were elected honorary members: G. S. Waid (So. Pacific), J. A. Christie (A. T. & S. F.), C. J. McDonald (So. Pacific), Howard Elliott (L. A. & S. L.), and W. R. Scott (So. Pacific.).

STEEL FOR CARS AND LOCOMOTIVES A WAR NECESSITY

"When the production of railroad cars and locomotives is interfered with because necessary steel is going to industries producing pleasure automobiles, steel furniture, buildings for amusements, etc., the situation cannot continue," says Weddill Catchings, chairman of the United States Chamber of Commerce Committee on Co-operation with the Council of National Defense.

This statement will be found in War Bulletin No. 2 issued last Friday. An abstract of the bulletin follows:

WAR REQUIREMENTS

The requirements of iron and steel in the prosecution of the war can hardly be exaggerated. Figures cannot be given but the broad statement can be made that the utmost which can be produced is below the requirements of the United States government and its allies and of business closely related to the war. This condition will continue; for, on the one hand, no substantial increase in production is anticipated—in fact, even maximum production from existing facilities cannot be expected because transportation, labor and material conditions will interfere with the full operation of plants—and, on the other hand, indications are that the war requirements will continue to increase.

The direct requirements of the government for pig iron are relatively small, but the requirements for steel are enormous and iron is therefore required in corresponding quantities. Steel is needed in the war for ships, railroad cars and locomotives, rails, trucks, containers, etc. Furthermore, there are the requirements for shells and other munitions work—requirements large in tonnage, far beyond what is generally supposed. In addition, business closely related to war, i. e., business producing government materials and supplies, the necessities of life and the materials for producing the necessities of life, require steel in great quantities for buildings, machinery, tools, containers, etc. When all these

requirements are met little if any steel will be left for so-called general business.

SUPPLY OF OTHER MATERIALS

With no other metal is the condition as disturbing as with iron and steel. Even the supply of copper is not nearly so inadequate. Materials which can be used in substitution for steel are plentiful in comparison. Lumber may be expected to meet all requirements and cement may be had in quantity for concrete work. While there may be delays in these cases a hopeless shortage does not exist.

The course for business men to pursue is clear. Iron and steel should be used only when the requirement is unavoidable. Every effort should be made to use wood and concrete in place of steel whenever this can be done, and construction and development work requiring steel should be postponed wherever possible.

OUTSTANDING CONTRACTS

Apparently little will be gained by contracting ahead for steel. Experience today indicates that soon producers of steel must ship their product where required in connection with the war rather than on such contracts as they may have on their order books. When the production of railroad cars and locomotives is interfered with because necessary steel is going to industries producing pleasure automobiles, steel furniture, buildings for amusement purposes, etc., the situation cannot be expected to continue.

PRIORITY IN DISTRIBUTION

Business men will probably make their plans in the expectation that soon there will be established an order of distribution of steel, and that the wild scramble to enter orders for future delivery of steel will be ineffective. In fact it will occur to many, no doubt, that failure to recognize this situation may lead to unfortunate results. In a business requiring steel, if contracts are placed for future delivery, not only for steel but for other materials, the manufacturer may find that he cannot get the steel but can get the other materials. In this case he might find that he had on hand large quantities of materials which he could not use because he had no steel.

LOCAL SOURCES FOR MATERIALS

In purchasing materials and supplies business men will doubtless consider the wisdom of returning, so far as possible, to doing business locally. The extraordinary service being rendered by the railroads in connection with the war will limit general transportation service and put an end during the war to the condition which has developed during the past fifty years through the prompt and reliable transportation facilities afforded by the railroads. No longer can a man in Illinois rely upon Pennsylvania as a dependable source of supply for raw materials and equipment. For many commodities the railroads can no longer spare the equipment to bring distant points into close contact. Purchase must be made near at home wherever this can be done. The preference which must be given to shipments of iron and steel will soon make this situation of daily importance.

INFORMATION FROM STEEL PRODUCERS

For the particular information of those in the iron and steel business it may be said that the Council of National Defense wishes to hear from producers of iron and steel whenever output is limited through transportation difficulties or through business conditions. Furthermore, pending the establishment of some method of distributing steel output according to war needs, producers of steel may render real service by assisting those producing war work to secure their steel requirements. Not only will this help win the war, but will tend toward less disturbance in business when steel supplies are shut off from those industries engaged in unessential production.

Taking Railroad Lawmaking by the Forelock*

Incessant Educational Campaign Necessary to Defeat
Vicious Legislation. Present Efforts in That Direction

By Howard Elliott

Inspector of Transportation of the Los Angeles & Salt Lake.

THE whole gamut of railway legislation is well known to railway men. No feature of the business has escaped the attention of the lawmakers unless it be specifications for track and roadway, or dining car prices. Under "new business" one legislature may be considering a bill new to them, but "the minutes of the last meeting" of a neighboring legislature will undoubtedly disclose it, though perhaps in a different form. Railway bills have been codified by various bureaus and anyone may obtain a list of them, with arguments, so there is no excuse for not being prepared when the bills are presented, or for omitting the missionary work between campaigns.

IMPROVED LEGISLATIVE METHODS

In the last decade railways have changed radically their methods of handling legislative business. Time was, not more than 10 years ago, when the "appearances" before commissions and legislatures were left to the railway attorneys. Now lawyers are popularly presumed to be sharp, and try as they may, they cannot overcome the impression that they rely as much on the "sharp quillets of the law" as on the "rule of reason" to prove their points. It dawned upon a group of railway executives about the year 1907 that the plan of sending practical operating and traffic men to the commissions and legislatures was at least worth trying. So there was organized in Chicago the Special Committee on Relations of Railway Operation to Legislation of the American Railway Association—with a branch in each state—composed of general managers, superintendents of motive power, general freight agents and the like. These committees have done yeoman service in defeating obnoxious laws, hurtful alike to the carriers and the public, they have been able to explain in language that could be understood by the lay mind the complex and intricate matters under discussion, and the prejudice which formerly existed over the manner of conducting this work has, for the most part, disappeared.

NEED FOR FURTHER IMPROVEMENT

But there is yet room for great improvement. I have been a member of such a committee in Utah for two terms, and in order to make the work still more effective, I offer the following suggestions:

Invite into the organization such corporations as light and power companies, street and interurban railways, and perhaps other public utility corporations, having them pay a share of the expense. This will avoid duplication of work on bills in which all such companies are interested. The committee should be formed immediately after the November election. A card index of the legislators should be kept, and the card should show previous education, business affiliations, and names of close friends. It is absolutely necessary that a representative of the committee be at the state house each day to keep track of bills and hearings, so that no bill shall be debated on the floor of the legislature until the railroads have been heard in committee. Committees, however, are not required to hold public hearings and it is essential that they be asked for. It should also be remembered that a perfectly innocent looking bill may be amended to be most vicious.

Don't hand to a legislator any argument more than one page long. No matter how difficult, boil it down until the main facts stand out boldly, and he can digest it while riding from his hotel to the state house. This may be the only time he has.

Don't mention the expense of complying with the law until all other arguments are used. Your opponents are going to say: "The corporations' excuse is the almighty dollar. That's the same objection the railways made to the air-brake, automatic coupler, and all progressive legislation." Which, by the way, is untrue. The railways hesitated to adopt those things until they were sure of getting the best devices, and then they asked for time to install them in order that the expense and inconvenience of removing cars from service might be spread over a number of years.

Don't issue any unsigned statements. Either sign them "Special Committee on Relations of Railway Operation to Legislation," or better yet, in the names of the committeemen.

Don't oppose vigorously any measures that affect others as much as they affect railways. Let the other fellows fight their own battles. We should not lay ourselves open to the charge of being obstructionists.

Don't ask the constituent lines for any data that you can get along without. Our departments are now overworked, and we must avoid calling on them for anything not absolutely needed.

Don't hesitate to call on individuals, chambers of commerce, boards of trade or commercial clubs to communicate with members of the legislature endorsing our position. If our work between campaigns has been effective, they will be glad to do this.

Don't work in the dark. Publish the fact that a committee is at work, tell where it may be found, and invite any legislator or anyone else to use the committee room as a library of information on any topic concerning public utilities. Whenever a statement is handed to members of the legislature, publish it also in the papers as a paid advertisement. That practice has a psychological and moral effect that is astonishing.

EXAMPLE OF ARGUMENTS

In Utah at the last legislative session there was introduced a bill limiting the number of cars in freight trains to 45. On behalf of the Special Committee on Relations of Railway Operation to Legislation, I issued the following statement and sent it to members of the legislature:

CONCERNING HOUSE BILL NO. 12, 45-CAR FREIGHT TRAIN LIMIT

"This bill will not do what it purports to do, prevent accidents. It will do exactly the opposite, increase them. Limiting trains to 45 cars means more trains; more trains more meeting points; more meeting points more accidents; more accidents more personal injuries. Employees failed to show a single accident that was caused by the length of the train. More accidents occur with short trains than with long ones. Records prove it."

"Railway wages are controlled by the brotherhoods and by Congress, railway rates by the commissions. Wages have gone up, rates down. The only flexible method railways have to economize is by cheapening the cost of transportation. This they have done through long trains."

"Millions have been spent by Utah railways in more powerful locomotives, stronger bridges, better cars, and in reducing and straightening grades and curves, to permit handling long trains. This law would make obsolete and of no use these millions which have been spent to do what this law would prevent them from doing."

"This law would work untold hardship on the public. Stock shippers, grain shippers, ore shippers, and wool shippers, would have to hold their shipments until trains with less than 45 cars came along. It would produce locomotive taxia in the commercial system of the state."

* From a copyrighted address before the Train Dispatchers' Association of America at Fresno, Cal., on June 20.

"The advocates of the bill say it would promote the safety of the public. The bill says so, too. Public safety is well cared for now. The Salt Lake Route, for instance, has not killed a passenger in a train accident anywhere on its lines for 10 years, and in Utah, never. The other lines have nearly, if not quite, as good a record. This bill, by making more trains, would increase accidents and loss of life.

"The Interstate Commerce Commission investigates thousands of accidents every year. Not once in their reports do they make this statement or any statement to the same effect: 'If this train had been shorter, the accident would not have occurred.' Employees have never suggested to their superior officers that trains be shortened as a means for preventing accidents.

"If such a regulation promoted safety the railways would eagerly adopt it. None is more anxious to make operation safe than they. If guided by no other consideration than that of avoiding the expense of accidents, they would do everything in their power to prevent them.

"Working on railways in Utah is very much easier than it used to be, and the men are very much better paid than any other workmen of the same class. Some of them draw more than \$300 a month, and the average is far higher than that of the professors in our oldest university, Harvard. This bill should properly be styled: 'An act to increase accidents on railways, to increase the expenses of railways and the public, and to prevent development of the state.'"

The bill was killed.

MISSIONARY WORK BETWEEN CAMPAIGNS

By sending practical railway men, instead of lawyers, to the legislatures, much of the odium against the "railway lobby" has been removed. But legislators still continue to present vicious bills and the remedy for the present plight of the railways is not to be found in legitimatizing or making respectable our legislative efforts. We must go further and take railway laws by the forelock and get back to the atmosphere in which those laws are conceived. By going direct to the people, we can not only explain to them the workings of any proposed law, but we can, in most cases, ascertain the conditions which give birth to the demand for the laws and remedy those conditions before they are made the subjects of legislative action.

WASHINGTON CORRESPONDENCE

WASHINGTON, D. C., July 2, 1917.

INTERSTATE COMMERCE COMMISSION REORGANIZATION BILL PASSED

The House on June 27 passed the bill to increase the membership of the Interstate Commerce Commission from seven to nine members and to authorize it to organize into divisions, but without the amendment added by Senator Smith when the bill passed by the Senate to require the commission to suspend all advances in rates against which a protest is filed. Representative Sims proposed a similar amendment in the House but it was disapproved by the Committee on Interstate and Foreign Commerce and was rejected without a division.

The enlargement of the commission is to be accomplished by the appointment of two additional commissioners, one for a term expiring December 31, 1921, and one for a term expiring December 31, 1922. The commission is authorized by its order to divide its members into as many divisions as it may deem necessary, which may be changed from time to time. Any commissioner may be assigned to and may serve upon such division or divisions as the commission may direct and the senior in service of the commissioners constituting any of the divisions shall act as chairman. In case of vacancy in any division the chairman of the commission or any commissioner designated by him for that purpose may serve temporarily. The commission may by order direct that any of its work, business or functions may be assigned or referred to any of the said divisions for action and may by order at any time amend, modify, supplement or rescind any such direction. The divisions are authorized to act for the commission "subject to review and approval by the commission, and application therefor may be made by any of the parties affected thereby." The language of the bill on this point is as follows:

"In conformity with and subject to the order or orders of the commission in the premises, each division so constituted shall have power and authority by a majority thereof

to hear and determine, order, certify, report, or otherwise act as to any of said work, business, or functions so assigned or referred to it for action by the commission, and in respect thereof the division shall have all the jurisdiction and powers now or then conferred by law upon the commission, and be subject to the same duties and obligations. Any order, decision or report made or other action taken by any of said divisions in respect of any matters so assigned or referred to it shall have the same force and effect, and may be made, evidenced, and enforced in the same manner as if made or taken by the commission as a whole, provided, however, that the action of any division shall be subject to review and approval by the commission, and application therefor may be made by any of the parties affected thereby. The secretary and seal of the commission shall be the secretary and seal of each division thereof."

In all proceedings before any division relating to the reasonableness of rates or to alleged discriminations, not less than three members shall participate in the decision and in all hearings relating to the valuation of railway property not less than five members shall sit in the hearing and participate in the decision. The Senate bill provided that seven members should participate in valuation hearings and also required three members to sit in hearings pertaining to rates. This was amended after Representative Esch had pointed out that it would require the commissioners to travel all over the United States taking testimony which is now taken by examiners, or that most of the hearings would have to be held in Washington.

The provision increasing the salary of the secretary of the commission from \$5,000 to \$7,500 per year was defeated in the House, as it was in the Senate.

In its report recommending the passage of the bill, the House committee presented figures showing the enormous increase in the work of the commission, saying that the work at present is so onerous and diversified that it is impossible for the commissioners to give personal attention to the various cases and complaints filed and that there is occasionally discontent and criticism that the cases cannot receive the personal attention of the commissioners themselves, but have to be heard and passed upon by agents and examiners. It was stated that the idea of the commissioners was that they should have a division on tariffs, a division on safety appliances, a division on accounting, a division on valuation and other divisions.

Referring to the Hoke Smith amendment to make suspension mandatory in case of a protest, the committee said it had considered that general subject several times without being able to conclude that the proposition was wise or practicable. If all advances were to be arrested by act of Congress and the commission were compelled to hold a hearing and investigate every proposed rate it would involve such a deluge of work as to paralyze the commission and nullify all the benefits sought to be derived by adding two members. It was stated that the commission itself has recommended a measure for establishing rates and practices as of a specified date as reasonable for the part with the provision that no change can be made therein subsequent to that date except upon order of the commission. The report suggested that possibly in conference between the two houses an agreement could be reached somewhat in line with this suggestion and a tentative provision to this effect was suggested, providing that rates, rules, practices, etc., as of January 1, 1915, except such as have been subsequently reduced, shall be regarded as just and reasonable and that no change should be made therein except upon order of the commission. The committee said, however, that the subject is too important for hasty action without mature and deliberate consideration.

Chairman Adamson of the committee, Representative Esch and others strongly advocated the passage of the bill and

the principal debate, except as to the Sims amendment, was on minor provisions. In opposing Sims' amendment Mr. Esch called attention to the fact that during 1916 there was filed with the commission 107,057 tariffs, many of them including hundreds of individual rates. Under the proposed amendment anybody feeling himself aggrieved could force a suspension, notwithstanding the fact that the commission as a result of the evidence in its own records, and all prior decisions in similar cases, might almost off-hand determine that the rates should be allowed. If the amendment became a law, he said, there will be many claim attorneys seeking the opportunity by a mere protest to start a formal proceeding. Representative Moore pointed out that the amendment would enable any individual in the United States, possibly some blackmailer, to automatically suspend rates.

In reply to the arguments of Representative Sims and others in favor of making the suspension mandatory, Mr. Adamson said that while he believed the commission would suffer before Congress and before the country if it should permit the proposed 15 per cent advance to go into operation without suspension, he believed it would be a much more severe blow to the commission for Congress to anticipate such action in advance and "strike them this legislative blow." The chief issue presented, he said, is "shall Congress permit the commission to continue to exercise its discretion as to suspending rates or will Congress take that out of their hands and make it mandatory?" Mr. Adamson said he had never doubted that the commission would suspend the rates and that to pass the Sims amendment would be little short of impeachment in advance of action. Mr. Adamson and Mr. Sims made it plain that they were opposed to the freight advance and received considerable applause when they said so. Mr. Adamson pointed out that the bill must go to conference and that the conference could hardly be concluded before the issuance of the rate decision.

The possibility of the discontinuance of the valuation was suggested by Representative Moore, who asked if the commission would not be able to do the necessary work without additional members if Congress were to take away from them the work of valuation. Mr. Adamson suggested that the valuation work probably will be entirely suspended during the war because of the uncertain values. It is impossible to arrive at any permanent value, he said. Mr. Moore said Congress continues to appropriate money for the purpose and the country needs the engineers and trained men who are in the valuation service for military service. To this Mr. Adamson replied that he did not think Congress will continue to appropriate money for the purpose during the war and that, according to his understanding, it is not necessary for Congress to take any action.

At the commission's office it was stated that the commission could no more discontinue the valuation which Congress has ordered and for which it has made appropriation for the ensuing fiscal year than it could discontinue its regular work without a direction from Congress. The commission has received a number of inquiries on the subject, to which it has replied that it knows of no intention to discontinue the valuation.

SENATE PASSES DAYLIGHT SAVING BILL

The Senate on June 27 passed the "daylight saving" bill, providing that at 2:00 a. m. of the last Sunday in April of each year, the standard time shall be advanced one hour and at 2:00 a. m. of the last Sunday in September of each year, the standard time shall be returned to the mean astronomical time of the degree of longitude governing each time zone. The bill also provides for legalizing the present standard time system of the United States, which was adopted at the instance of the railroads in 1883, but which has not had

the authority of law except by action of some state legislatures or local ordinances. It provides for the present five time zones, whose limits shall be fixed by the Interstate Commerce Commission, having regard for the convenience of commerce and the existing junction points and division points of common carriers, and the commission's orders may be modified from time to time. The effective date proposed is January 1, 1918. It was stated that the railroads had made the only opposition to the bill, on the ground of the inconvenience caused by the effect on the schedules of trains en route at the time of the change.

AGREEMENT TO REDUCE BITUMINOUS COAL PRICES

Tentative reductions in prices of bituminous coal, to become effective on July 1, were agreed upon in conferences between the coal operators and government officials at Washington on June 28, but a controversy has arisen which threatens the plan agreed upon. Following the conferences held with the government officials earlier in the week, at which it was decided that committees of coal operators should fix the prices, a question was raised as to the legality of such a plan and a new resolution was adopted providing that committees of seven for each coal producing state and an additional committee of seven appointed by the representatives of the anthracite industry, should confer with the Secretary of the Interior, the Federal Trade Commission, and the Committee on Coal Production of the Council of National Defense, to the end that production be stimulated and plans be perfected to provide adequate means of distribution. These committees were also to report forthwith to the Secretary of the Interior, the trade commission and the coal committee the costs of and the conditions surrounding the production and distribution of coal in each district, and were authorized, in their discretion, to give assent to such maximum prices of coal f. o. b. cars at mines in the various districts, as might be named by Secretary Lane, the trade commission and the coal committee. After the legal question had been raised it was proposed that the responsibility for the actual fixing of prices should be placed on the government. The tentative reduction in prices on July 1 was proposed by Secretary Lane to be effective until the investigation into costs and conditions warrants an increase or reduction in the tentative prices. The tentative prices do not affect contracts or sales made before July 1. In most cases the prices fixed were from \$3.00 to \$3.50 per ton, the price to the government to be 50 cents less. The reductions range from \$1 to \$5 a ton.

The status of the agreement was thrown into uncertainty, however, on June 30 when the Secretary of War, as president of the Council of National Defense, repudiated the agreement, saying that the prices fixed were excessive and that the committee had no power to fix prices.

Tentative maximum prices for anthracite coal had already been made by the anthracite operators in co-operation with the Federal Trade Commission.

Representative Sims of Tennessee has introduced a resolution, H. J. Res. 111, to authorize the President whenever, in his judgment, it shall be necessary for the efficient prosecution of the war, to direct coal and coke producers to sell their produce only to the United States, and also authorizing the President to direct any or all railroads, ships or boats engaged in coastwise or inland lake or river trade and all other common carriers in the United States, to be operated as a unit on government account under direction and control of the Interstate Commerce Commission, under such rules and regulations as the commission shall prescribe. The bill prescribes that the owners shall be paid a compensation equal to the average annual net amount earned for the five-year period prior to June 30, 1916. Such direction and control shall continue for the period of the war and not to exceed one year thereafter.

General News Department

At a meeting of the executive committee of the Railway Equipment Manufacturers' Association at Chicago, June 11, the convention of the association for this year was canceled.

The Nashville, Chattanooga & St. Louis has made an advance of about 10 per cent, taking effect June 15, in the pay of all employees, except general officers, who have not recently received advances. About 4,000 persons will be affected.

In serious riots at East St. Louis, Ill., on July 2, started by the lawless acts of men and women who objected to the importation of large numbers of negro laborers from the south, the freight house of the Southern Railway and 100 loaded freight cars, standing on that company's tracks, were destroyed by fire. Much other property was also burnt up.

Returns for May for 72 roads, operating 103,000 miles, made public by the Interstate Commerce Commission on July 3, show an increase in net revenue per mile from \$457 to \$466, but a decrease for five months from \$2,063 to \$1,949. The western roads show an increase for the month, but the eastern, southern and western districts all show a decrease for the five months.

Reports received by the bureau of construction and repair of the Navy Department, state that the shipments of steel for government uses from the Pittsburgh district for May amounted to 69,112,141 pounds. Of this the Carnegie Steel Company shipped 63,542,930 pounds and other companies 5,569,211 pounds. This is more than the six months' record of such shipments under normal conditions.

The secretary of the Canadian Northern Railway Patriotic Association announced recently that during January, February, March and April this year the association collected and contributed to the Canadian Patriotic Fund \$24,554. The association has now been thoroughly organized throughout the system from Quebec to Vancouver, and it is anticipated that the returns for the next four months will be even more favorable.

The Louisville & Nashville has made arrangements to buy a large quantity of goggles to supply every man in its shops in Kentucky. Now, if the men do not wear the glasses, after the employer furnishes them, they must themselves bear the risk of injuries, which could have been prevented by wearing glasses. Under the Kentucky Workmen's Compensation law credits are given on the basic risk rates on liability insurance where employers adopt safety first measures. One of these credits is in connection with the furnishing of goggles.

In a safety bulletin recently issued by R. C. Richards, chairman of the central safety committee of the Chicago & North Western, an appeal is made to employees not to take chances by violating safety regulations. The circular says in part: "Get after the chance-takers and teach them to be careful or drive them out of the service before, and not after, some one is killed or injured." It may be you. During the six years ending December 31, 1916, 85 per cent of the deaths and injuries to North Western men were caused by dangerous or thoughtless practices."

The United States Civil Service Commission announces examinations, July 25, for the positions of junior mechanical engineer, junior signal engineer, junior structural engineer and junior telegraph and telephone engineer. All of these examinations are for positions in the department of valuation, Interstate Commerce Commission. Applicants must be between 21 and 36 years old. They must have had five years' experience for the first grade and three years for the second grade; and numerous other conditions are imposed. Salaries, for grade 2, from \$720 to \$1,080; and for grade 1, from \$1,200 to \$1,680.

A. J. Earling, president of the Chicago, Milwaukee & St. Paul, has presented a copy of Elbert Hubbard's "Message to Garcia" to each of the members of the St. Paul company of the Third Reserve Engineers, who will leave for France this summer to operate railroads at the front. On the cover of the booklet is a

print of the American flag in colors, under which is the following quotation from President Wilson's war message: "The world must be made safe for democracy. Its peace must be planted upon the tested foundations of political liberty." The text is prefaced by Mr. Earling's own message to the men: "In wishing the officers and employees of the Chicago, Milwaukee & St. Paul God-speed as they depart for the front, it is my sincere wish that each and every one may have the opportunity of delivering that message to Garcia and safely return to the happiness of his home with the consciousness of having been ready and a realization that the hero of the war was the man who delivered the message when called upon."

The Secretary of War, according to an announcement by the War Department, has taken a hand in the controversy between the Louisville & Nashville and Western Union Telegraph Company as to the right of the latter to maintain its line along the right of way of the road. Recently the railroad announced that it would not tolerate the Western Union wires on its road and it was understood that orders had been given to gangs of workmen to chop down the poles. The Secretary of War despatched a message to the heads of the two companies informing them that they would be expected to come to a peaceable and prompt agreement. Otherwise, he intimated, the telegraph line would be taken over and operated by the government in such a way as to make interference impossible.

Priority Bill Passed by House of Representatives

The house on June 29 passed with very little debate the priority bill, giving the President power to direct that such traffic or such shipments as may be essential to the national defense and security shall have preference or priority in transportation by any common carrier. As passed by the House, the bill contains amendments proposed by the Committee on Interstate and Foreign Commerce which will necessitate a conference before the bill goes to the President for his signature. At the suggestion of Representative Sims, an amendment was added to include the provision struck out by the Senate, to provide that nothing in the section prohibiting obstruction of interstate or foreign commerce shall be construed to affect the provisions of the Clayton law applying to organized labor.

Green for Proceed on the Pennsylvania

The Pennsylvania Railroad announces that on June 28 the use of green lights (in place of white) for the proceed indication at night in semaphore signals, and yellow (in place of green) for caution, was made universal throughout the company's lines east of Pittsburgh. Much delay has been experienced in making this change because of difficulty in getting materials. Corresponding changes have been made in the marker lights carried on the rear of passenger and freight trains; in switch lamps, slow signs, hand lamps, etc.

The Western Union on the Pennsylvania

The contract between the Pennsylvania Railroad Company and the Postal Telegraph Cable Company for the handling of commercial messages, which has been in effect since July 1, 1902, expired last Saturday night. The Postal will continue to operate independent public offices with its own forces at certain large stations, including New York, Philadelphia, Baltimore, Harrisburg and Pittsburgh; also at Union Station, Washington, which is controlled jointly by the Pennsylvania and the Baltimore & Ohio. Arrangements have been made by which the Western Union Telegraph Company will also open independent offices to be operated by its own forces in the stations at New York, Philadelphia, Baltimore, Harrisburg and Pittsburgh. A Western Union office already exists at Union Station, Washington.

At other stations on the Pennsylvania Railroad the railroad

company will henceforth act as agent of the Western Union instead of the Postal.

It is not contemplated that the Western Union will erect pole lines on the Pennsylvania's right of way. Such wires and cables as the Western Union may require in connection with the acceptance of commercial messages from the various stations on the Pennsylvania Railroad will be strung on the pole lines, or placed in the conduits of the railroad company. A new agreement is now being negotiated with the Postal Company, by which that company will retain its wires and cables on the poles and in the conduits of the railroad company.

Final Returns on the Liberty Loan

The railways' campaign for subscribers to the Liberty Loan resulted in 241,280 subscribers for a total of \$30,027,966 in bonds, says the report which has just been received by participating roads from the Liberty Loan Committee of Railroads. The list of subscribers by roads follows:

REPORT OF LIBERTY LOAN SUBSCRIPTIONS

	Individuals	Amount
Abilene & Southern	23	\$65,500
Alabama & Vicksburg .....	...	36,000
Atlanta, Birmingham & Atlantic .....	...	20,400
Atlanta & West Point	200	25,000
Atlantic Coast Lines	1,819	239,350
Atchison, Topeka & Santa Fe	6,827	714,050
Augusta Southern	5	5
Baltimore & Ohio	4,940	397,300
Baltimore & Ohio Chicago Terminal	89	8,450
Bangor & Aroostook	455	40,550
Boston & Maine	6,222	322,250
Buffalo & Susquehanna	299	49,150
Buffalo Creek Railroad	123	7,850
Buffalo, Rochester & Pittsburgh	3,390	275,650
Carolina, Clinchfield & Ohio	695	57,400
Central of Georgia .....	...	63,150
Central R. R. of New Jersey	1,050	21,500
Central Vermont	725	45,000
Charleston & West Carolina	191	16,950
Chesapeake & Ohio	3,500	350,000
Chicago & Alton .....	...	11,650
Chicago & Eastern Illinois	475	50,000
Chicago & North Western	1,776	128,250
Chicago & Western Indiana	427	38,150
Chicago, Indianapolis & Louisville	1,463	21,500
Chicago, Burlington & Quincy	1,424	152,960
Chicago Great Western .....	...	75,000
Chicago, Milwaukee & St. Paul	2,090	217,000
Chicago, St. Paul, Minneapolis & Omaha .....	...	44,400
Chicago, Indianapolis & Western	211	25,000
Delaware & Hudson	7,367	514,200
Delaware, Lackawanna & Western	16,886	1,091,336
East Tennessee & West North Carolina .....	...	12,800
Florida East Coast	14,103	1,005,870
Fort Smith & Western	436	49,850
Georgia & Florida .....	...	19,200
Georgia Railroad	45	4,000
Great Northern	1,850	56,900
Gulf, Mobile & Northern .....	...	153,650
Hocking Valley .....	...	30,600
Illinois Central	150	30,000
Indiana Harbor	61,056	61,900
Kansas City Southern	931	104,750
Lakeside & Marblehead .....	...	3,000
Lehigh Valley	9,768	701,050
Louisiana & Arkansas .....	...	3,000
Louisville & Nashville	5,654	490,200
Maine Central	108	27,750
Minneapolis & St. Louis .....	...	60,000
Minneapolis, St. Paul & Sault Ste. Marie	913	90,150
Missouri & North Arkansas	107	9,350
Missouri, Oklahoma & Gulf	68	5,200
Missouri Pacific	300	19,000
Nashville, Chattanooga & St. Louis	1,399	119,000
Norfolk & Southern	50	5,000
New Mexico Central .....	...	2,450
Nevada-California-Oregon .....	...	500
New York Central Railroad	19,312	1,345,150
Boston & Albany .....	...	66,300
Michigan Central	4,448	315,950
C. C. & St. Louis Ry.	2,448	192,240
Cincinnati Northern	137	14,800
Lake Erie & Western	796	51,300
Toledo & Ohio Central	269	22,850
Kanawha & Michigan	86	10,550
Pittsburgh & Lake Erie	435	28,600
Indiana Harbor Belt	327	29,100
Total New York Central Lines	29,028	2,906,800
New York, Chicago & St. Louis	1,525	115,500
New York, New Haven & Hartford	327	26,500
New York, Ontario & Western	207	21,250
Norfolk & Western	2,074	251,800
Northern Pacific	1,358	116,000
Pacific Electric	2,535	180,400
Pennsylvania Railroad	52,510	3,378,350
Pennsylvania Lines	6,220	597,200
Pennsylvania System—Total	58,730	3,975,550
Pere Marquette	974	...
Philadelphia & Reading	5,588	398,450

Pittsburgh & Shawmut	39	5,600
Quanaah, Acme & Pacific	5,303	5,300
Richmond, Fredericksburg & Potomac	222	14,500
St. Louis-San Francisco	718	131,150
St. Louis Southwestern	744	63,900
South Buffalo	169	12,900
Southern Pacific	13,168	1,319,000
Southern Railway	4,343	293,850
Spokane, Portland & Seattle .....	...	60,100
Terminal Railroad of St. Louis	766	52,500
Toledo, Peoria & Western	118	18,400
Toledo Terminal	46	2,250
Texas & Pacific	1,296	99,100
Utah & Delaware .....	...	121,000
Union Pacific System	15,693	1,626,650
Vicksburg, Shreveport & Pacific	638	58,650
Virginian	128	8,300
Wabash	670	67,200
Wadley Southern .....	...	100
Weath. Mineral Wells & Northern	18	900
Western Maryland	1,108	69,500
Wheeling & Lake Erie .....	...	20,000
Western Pacific	346	120,600
Rutland Railroad	563	43,300
Total individuals subscribing	241,280	
Total amount subscribed		\$30,027,966

Discouraged and Amazed

Samuel Rea, president of the Pennsylvania, in a statement issued last week regarding the decision of the Interstate Commerce Commission in the 15 per cent advance freight rate case, said:

"I am amazed at the reasoning and discouraged by the conclusions. The Eastern railroads are the great terminals for the whole country, and absolutely require the 15 per cent increase immediately. The Pennsylvania System is indicative of conditions on the railroads in eastern territory, and its operations verify the estimates made for the commission. The five months ending with May show an increase of about 9 per cent in gross earnings, but a decrease of about 27 per cent in net operating income, or nearly \$10,500,000, compared with 1916. Costs of labor and materials are still rising, especially fuel coal, which will be increased by several millions over what was estimated in the rate case.

"Notwithstanding all the railroads are doing in co-operation with the government (and no other interests are doing more), the country will realize that there will probably be more congestion next fall and winter than it has heretofore experienced. We are bending every effort to meet that situation, but instead of putting the railroads in a position where they can give substantial assistance by additional facilities and equipment, their credit will be seriously limited by this decision, and the country at large must of necessity suffer.

"The commission estimates a return of only 4.89 per cent for the year ending June 30, 1917, on the road and equipment provided for public use by the Eastern railroads, and yet declines to grant a reasonable increase in rates. What credit or progress can be based on any such inadequate return? The experience of the weak condition of the railroads for five years prior to 1916, with practically no new mileage constructed, and insufficient terminal facilities, is utterly ignored. I dislike to criticize any governmental decision, but the people should know why it is impossible to provide adequate facilities and service, which are imperatively required for this growing country, and should understand how unjustly the Eastern railroads are being treated."

Investors' View Will Test the Government's Action

A. H. Smith, president of the New York Central Lines, issued a statement on the rate advance decision, saying that until the details could be checked it would be impossible to say what increased revenue will be received by the New York Central Lines. Continuing, he said:

"The application for increased rates as presented was, in our opinion, conservative, and did not nearly meet the added expenditures placed upon us. . . . The railroads of this country require a continuing outlay for betterment and enlargement. The unusual conditions of today are bringing up hourly many problems requiring large expenditures of money on capital account. Such money must be had from the investing public. If the people who have it to invest will accept the judgment rendered by the commission and provide the money, very well. Their action will then support the view of the government's commission. That will be the test. . . ."

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF APRIL, 1917

Name of road.	Average mileage during period.	Operating revenues			Operating expenses			Net railway operation.	Railway operating income (or loss).	Increase (or decrease) on last year.
		Freight.	Passenger.	Total (inc. misc.).	Way and structures.	Equip. maintenance.	Traffic.			
Kansas City, Mexico & Orient.....	466	195,993	14,256	\$117,431	\$19,579	\$26,811	\$3,951	\$65,458	\$261,989	\$7,926,617
Midland Valley.....	385	176,974	46,305	223,279	28,447	30,919	716,622	1,136,069	32,068	\$1,136,069
Ohio Railway & Land Co.....	44	33,666	117,027	150,693	18,196	20,743	30,391	1,136,069	40,624	1,136,069
Port Marquette.....	2,350	1,603,059	332,650	1,935,708	234,739	232,420	39,662	1,136,069	40,624	1,136,069
FOUR MONTHS OF CALENDAR YEAR, 1917										
Central New Jersey.....	684	\$8,303,152	\$1,857,673	\$11,074,601	\$965,399	\$2,158,158	\$116,803	\$4,360,885	\$65,458	\$261,989
Central New England.....	301	1,493,079	115,842	1,608,921	283,408	178,785	4,427	636,954	1,486	4,427
Central Vermont.....	411	892,804	281,059	1,173,863	138,776	206,743	30,391	716,622	9,403	40,624
Chesapeake & Ohio.....	280	1,155,277	167,946	1,323,223	183,946	332,772	30,391	716,622	9,403	40,624
Chicago & Alton.....	1,053	4,435,149	1,295,856	5,731,005	631,658	1,238,031	152,613	2,292,185	42,289	129,767
Chicago & Eastern Illinois.....	1,131	4,900,408	1,040,715	5,941,123	647,636	1,658,271	111,438	2,495,285	43,106	155,197
Chicago & Erie.....	8,108	2,259,152	168,921	2,428,073	224,946	338,407	74,513	1,254,093	12,213	68,864
Chicago & North Western.....	8,108	2,054,126	6,877,211	8,931,337	3,487,065	5,442,272	443,183	13,360,065	274,674	787,864
Chicago, Burlington & Western.....	3,763	2,712,608	6,900,584	9,613,192	3,807,252	5,708,206	324,433	13,534,412	313,174	841,352
Chicago, Detroit & Can. Gd. Trk. Jctn.....	1,496	3,509,708	108,904	3,618,612	604,251	971,188	182,051	2,050,245	45,801	189,933
Chicago, Great Western.....	634	2,065,658	617,143	2,682,801	270,481	517,087	81,004	1,092,449	2,033	73,548
Chicago, Indianapolis & Louisville.....	10,222	23,767,471	5,814,512	29,581,983	2,837,468	6,271,250	599,144	15,015,969	245,884	654,875
Chicago, Junction & St. Paul.....	477	857,628	247,360	1,104,988	121,666	174,539	30,391	716,622	9,403	40,624
Chicago, Rock Island & Gulf.....	7,656	18,056,712	1,614,455	19,671,167	3,355,441	5,051,424	547,092	10,446,123	175,113	662,077
Chicago, Rock Island & Pacific.....	1,753	4,154,011	1,620,212	5,774,223	634,507	1,351,455	177,807	2,756,616	63,280	179,659
Chicago, Terre Haute & Southeastern.....	328	1,012,368	64,607	1,076,975	115,071	256,168	16,885	408,001	8,004	31,287
Cincinnati, Indianapolis & Western.....	328	2,423,827	371,291	2,795,118	444,115	698,724	58,246	1,350,494	12,061	34,054
Cincinnati, Indianapolis & Western.....	328	2,423,827	371,291	2,795,118	444,115	698,724	58,246	1,350,494	12,061	34,054
Cincinnati, Northern.....	246	621,304	36,721	658,025	105,917	138,569	12,450	305,017	41,388	77,975
Cleveland, Cincinnati, Chic. & St. L.....	2,437	11,009,337	3,224,668	14,234,005	1,351,177	2,986,643	331,169	6,718,777	101,331	344,538
Coal & Coke.....	107	330,382	63,864	394,246	40,178	67,615	4,370	169,119	12,450	11,334
Colorado Southern.....	438	337,612	40,217	377,829	30,960	127,425	26,645	126,199	1,463	22,592
Colorado, & Wyoming.....	43	130,144	9,211	139,355	33,167	27,729	55,276	126,199	1,463	22,592
Cripple Creek & Colorado Springs.....	87	361,926	46,901	408,827	38,367	47,593	5,775	96,109	13,682	204,931
Dunsmuir Valley (C. & R. Dept.).....	164	1,157,088	147,279	1,304,367	130,210	177,433	17,743	361,609	3,426	39,024
Delaware, Lackawanna & Western.....	255	12,831,994	2,652,526	15,484,520	1,852,525	2,99,982	5,916	11,743,533	34,369	117,945
Denver & Rio Grande.....	2,578	6,824,794	1,186,631	8,011,425	1,620,937	2,755,308	10,081	5,754,323	26,737	57,543
Denver & Salt Lake.....	255	457,603	77,004	534,607	110,326	176,998	7,882	310,639	20,767	626,604
Detroit & Mackinac.....	383	284,442	99,185	383,627	44,568	66,551	7,915	153,251	14,257	31,718
Detroit, Grand Haven & Milwaukee.....	190	635,206	163,500	798,706	112,373	187,400	244	370,907	30,509	370,907
Detroit, Toledo & Ironton.....	441	735,005	45,816	780,821	77,820	115,633	16,828	507,734	31,638	749,664
Duluth & Iron Range.....	269	332,672	86,432	419,104	268,053	252,855	4,819	330,520	45,146	896,589
Duluth, Missabe & Northern.....	414	572,272	123,894	696,166	486,538	428,615	12,782	416,935	5,126	14,403,351
Duluth, North Shore & Atlantic.....	600	946,639	277,989	1,224,628	205,141	173,631	30,085	597,286	15,990	34,782
El Paso & Southwestern Co.....	1,028	3,893,640	707,376	4,601,016	414,263	83,965	1,248,531	2,865,631	106,574	469,459
Elgin, Joliet & Eastern.....	801	4,473,999	93	4,474,092	430,606	1,431,402	31,472	1,756,975	8,217	37,580,836
Erie.....	1,988	15,310,667	2,891,859	18,202,526	1,878,115	5,552,780	370,609	10,112,292	142,941	519,622
Florida East Coast.....	765	1,477,296	1,362,880	2,840,176	332,033	272,097	315,498	812,222	64,260	1,510,369
Galveston, Harrisburgh & San Antonio.....	1,461	4,512,609	630,770	5,143,379	850,691	1,39,862	20,913	2,976,724	15,437	4,308,177
Galveston Wharf.....	14	.....	.....	.....	5,656	5,235	1,192	116,052	2,678	23,265
Georgia.....	307	794,284	283,539	1,077,823	109,764	179,135	53,731	483,828	38,309	864,980
Georgia Southern & Florida.....	402	535,275	268,315	803,590	130,813	184,859	29,206	345,546	3,441	37,872
Grand Rapids & Indiana.....	347	2,173,062	2,007,905	4,180,967	256,149	370,133	38,580	731,227	74,200	198,877
Grand Rapids & Western.....	347	2,173,062	2,007,905	4,180,967	256,149	370,133	38,580	731,227	74,200	198,877
Great Northern.....	8,195	16,466,549	4,427,775	20,894,324	3,493,639	3,993,099	426,908	9,202,322	331,453	464,455
Gulf & Ship Island.....	308	482,611	114,936	597,547	90,448	95,760	12,406	197,222	1,340	32,952
Gulf, Colorado & Santa Fe.....	1,937	4,002,550	912,313	4,914,863	1,026,732	806,820	130,702	1,839,429	233,989	4,071,522
Gulf, Mobile & Northern.....	402	320,917	98,515	419,432	138,386	108,081	15,908	218,095	33	32,845
Houston, East & West Texas.....	1,91	439,410	113,170	552,580	68,814	71,583	3,762	130,609	13,051	3,622,691
Houston, East & Texas.....	1,91	439,410	113,170	552,580	68,814	71,583	3,762	130,609	13,051	3,622,691
Illinois Central.....	918	4,692,361	2,356,013	7,048,374	353,962	69,424	796,916	18,239	77,216	1,631,304
Indiana Harbor Belt.....	4,766	19,922,209	5,033,905	24,956,114	2,760,657	4,441,669	164,169	18,968,606	6,551,556	18,968,606
International & Great Northern.....	1,159	4,551,544	792,754	5,344,298	1,709,743	2,07,417	1,2157	876,124	37,401	1,889,238
International & Great Northern.....	1,159	4,551,544	792,754	5,344,298	1,709,743	2,07,417	1,2157	876,124	37,401	1,889,238

One Road Taken by the Government

The War Department announces that the Hoboken Shore Railroad has been taken over by the Government. This road is one mile long, from Hoboken, N. J., north to Weehawken, with about 8 miles of track. It is used exclusively for freight. The War Department proposes to extend the tracks southward a short distance to reach the docks of the German steamship lines. The president of the road is Charles D. Boyles, Hoboken N. J.

War Taxes

The revised war revenue bill carrying the proposed excess profits tax on corporations, including railroads, was completed by the Senate finance committee on Monday and reported to the Senate on Tuesday. The excess profits tax is graduated from 12 to 50 per cent on net income in excess of the average net income for the pre-war years 1911, 1912 and 1913, with an exemption of \$5,000. The 12 per cent rate applies on taxable profits up to 15 per cent of the normal profit. The proportion between the excess profits and the net income in each case is to be determined by the Commissioner of Internal Revenue in accordance with regulations prescribed by him with the approval of the Secretary of the Treasury. If during the pre-war period the net income was less than 6 per cent on the average capital employed the proportion of taxable income may be determined either on the basis of the profits of representative corporations in a similar business or by deducting 6 per cent from the net income during the taxable year, at the option of the taxpayer. Capital is defined as "the fair average value of the assets actually invested and employed" less the "average amount of the liabilities incurred in respect to such trade or business."

In addition to the income taxes imposed by the act of September 8, 1916, as amended, corporations are required to pay an additional tax of 2 per cent and an additional tax of 15 per cent, upon the amount remaining undisturbed 60 days after the end of the year, of the net income except the amount used for the establishment or maintenance of reserves required by law or, with the approval of the Interstate Commerce Commission or state authorities, for extensions, additions and betterments. In assessing the income tax the net income shall be credited with the amount of the excess profits tax.

The bill also provides for a tax of 3 per cent on the amounts paid for transportation by rail or water or by any form of mechanical motor power in competition with carriers by rail or water, a tax of 1 cent for each 25 cents paid for express or parcel post shipments, a tax of 5 per cent on the amounts for passenger transportation, not including commutation or season tickets for trips less than 40 miles or for less than 35 cents and a tax of 5 per cent on amounts paid for seats, berths or state rooms in parlor cars, sleeping cars or vessels. The tax on freight bills does not apply to company material.

Report From American Commission in Russia

A cable despatch of July 4 gives a summary of a report issued in Petrograd by the Stevens Commission on that day to the Russian public, with recommendations for reforms.

The commission has received the full sympathy and support of its Russian colleagues. The Russian railroads are found to have excellent technical personnel, and many roads have a good practical system of management, the extension of which to other roads is desirable. The first necessary reform is in connection with operation and involves the employment of more powerful locomotives and freight cars of larger capacity.

The construction of shops at Vladivostok to assemble locomotives imported from the United States is deemed necessary. In all repair shops work ought to continue uninterruptedly 24 hours a day. The regulation of exchange of cars between the different roads should be improved, and loading and unloading should be quickened.

The creation of a Special State Department, the chief of which will be an inspector general, responsible for seeing that the whole network of roads is supplied with all necessary material, and also for the responsible distribution of such material between the different roads, is recommended by the commission.

The most important problem is declared to be to bring the railroads into a condition which will insure an adequate system of supply for the army and civilian population. Chairman Stevens immediately sent a cablegram to Washington requesting

that the construction of locomotives and cars be undertaken at once. The order, it is said, will require the increase of America's credit to Russia by 750,000,000 roubles.

The report concludes by saying that the commission is still engaged in considering the question of the supply of raw material, rails and machinery for the Russian roads.

Master Car and Locomotive Painters' Association

Owing to the state of war declared and now existing between the United States and Germany, it has been decided by the president and executive board that the forty-eighth annual convention of the Master Car and Locomotive Painters' Association of the United States and Canada will be postponed until further notice.

MEETINGS AND CONVENTIONS

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

- AIR BRAKE ASSOCIATION.—F. M. Nellis, Room 3014, 165 Broadway, New York City.
- AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontious, 455 Grand Central Station, Chicago. Next meeting, July 18, 1917, Asheville, N. C.
- AMERICAN ASSOCIATION OF DINING CAR SUPERINTENDENTS.—H. C. Boardman, D. L. & W., Hoboken, N. J. Next convention, October, 1917, San Francisco, Cal.
- AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, Illinois Central, Chicago, Ill.
- AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, R. R. of N. Y., 143 Liberty St., New York. Next meeting, October 16-17, St. Louis.
- AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Hartman, Room 101, Union Station, St. Louis, Mo. Annual meeting to have been held August 8-10 indefinitely postponed.
- AMERICAN ELECTRIC RAILWAY ASSOCIATION.—E. B. Burrill, 8 W. 40th St., New York. Convention for 1917 abandoned.
- AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOCIATION.—Fred C. J. Dell, 165 Broadway, New York.
- AMERICAN RAILROAD MASTER TINNERS', COPPERSMITHS' AND PIPEFITTERS' ASSOCIATION.—W. E. Jones, C. & N. W., 3814 Fulton St., Chicago. Convention for 1917 postponed.
- AMERICAN RAILWAY ASSOCIATION.—J. E. Fairbanks, general secretary, 75 Church St., New York.
- AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 16-18, 1917, St. Paul, Minn.
- AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Frisch, 900 S. Michigan Ave., Chicago.
- AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, 1112 Katzen Bldg., Chicago.
- AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—Owen D. Kinsley, Illinois Central, Chicago. Next convention, to have been held August 30-September 1, Hotel Sherman, Chicago, postponed for one year.
- AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.
- AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.
- AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.
- AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, Supt. Timber Preservation, B. & O. Mt. Royal Sta., Baltimore, Md. Next convention, January, 1918, Chicago.
- ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—E. R. Woodson, Rooms 1116-8 Woodward Bldg., Washington, D. C.
- ASSOCIATION OF MANUFACTURERS OF CHIEF CAR WHEELS.—George W. Lyndon, 143 McCormick Bldg., Chicago. Semi-annual meeting with Master Car Builders' Association.
- ASSOCIATION OF RAILWAY CLAIM AGENTS.—Willis H. Failing, Terminal Station, Central of New Jersey, Jersey City, N. J.
- ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucci, C. & N. W., Room 411, C. & N. W. Sta., Chicago. Semi-annual and annual convention postponed indefinitely.
- ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—W. L. Connelly, Superintendent of Telegraph, Indiana Harbor Belt, Gibson, Ind. Next annual meeting, September 11-13, 1917, Washington, D. C.
- ASSOCIATION OF TRANSPORTATION AND RAILWAY ACCOUNTING OFFICERS.—G. P. Conard, 75 Church St., New York.
- BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—Tom Lehon, The Lehon Company, Chicago. Meetings with American Railway Bridge and Building Association.
- CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.
- CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.
- CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.
- CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.
- CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—W. R. McMunn, New York Central, Albany, N. Y. Next convention, September, 1917, St. Louis.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 568 Union Arcade Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

FREIGHT CLAIM ASSOCIATION.—Walter P. Taylor, Traffic Manager, R. F. A. P., Richmond, Va.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, C. H. & D., Lima, Ohio. Next annual meeting, to have been held August 21-23, 1917, (Chicago, postponed for one year).

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—J. G. Crawford, C. B. & O. R. R., 702 E. 51st St., Chicago. Next convention, May, 1918, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1126 W. Broadway, Winona, Minn. Annual meeting, to have been held September 4-7, 1917. Hotel Sherman, Chicago, indefinitely postponed.

INVESTMENT BANKERS' ASSOCIATION OF AMERICA.—Frederick R. Fenton, 11 W. Monroe St., Chicago. Annual convention, October 1-3, 1917, Baltimore, Md.

MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 16-18, 1917, Cleveland, Ohio.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York.

MASTER CAR LOCOMOTIVE PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—A. P. Dane, B. & M., Reading, Mass. Next annual meeting, September 11, 1917, Chicago.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, 1112 Karpen Bldg., Chicago.

NATIONAL ASSOCIATION OF RAILWAY COMMISSIONERS.—Jas. B. Walker, 120 Broadway, New York City. Next annual convention, October 16, 1917, Washington, D. C.

NATIONAL RAILWAY APPLIANCE ASSOCIATION.—C. W. Kelly, 349 Peoples Park Bldg., Chicago.

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

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Geo. A. J. Hochgrebe, 623 Brinsford Bldg., Buffalo, N. Y. Meeting, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PACIFIC RAILWAY CLUB.—W. S. Wollner, Assistant to Chief Engineer, Northwestern Pacific R. R., San Francisco, Cal.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—C. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Nason, 30 Church St., New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial-Annex Hotel, Pittsburgh.

RAILWAY DEVELOPMENT ASSOCIATION.—D. C. Welty, Commissioner of Agriculture, St. L., Iron Mt. & So., 1047 Railway Exchange Bldg., St. Louis. Next annual convention, May, 1918, Houston, Tex.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—J. Scribner, 1063 Monadnock Block, Chicago. Meetings with Association of Railway Electrical Engineers.

RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, Office of the President's Assistant, Seaboard Air Line, Norfolk, Va. Next meeting, October 2-4, 1917, St. Louis, Mo.

RAILWAY REAL ESTATE ASSOCIATION.—R. H. Morrison, Assistant Engineer, C. & O., Richmond, Va. Next convention, October, 1917, Duluth, Minn.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next meeting, June, 1917, Hotel McAlpin, N. Y. Next annual convention, September, 1917, Atlantic City, N. J.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, N. Y. C. R. R., Box C, Collinwood, Ohio.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Cowhay, 2136 Oliver Bldg., Pittsburgh, Pa. Meetings with Master Car Builders' and Master Mechanics' Association.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 50 Church St., New York. Meetings with Association of Railway Telegraph Superintendents.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September 18-21, 1917, Hotel Auditorium, Chicago.

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

SALT LAKE TRANSPORTATION CLUB.—R. E. Rowland, David Keith Bldg., Salt Lake City, Utah. Regular meetings, 1st Saturday of each month, Salt Lake City.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—L. W. Cox, N. & W., Philadelphia, Pa.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. R. R. Atlanta, Ga.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.

TOLEDO TRANSPORTATION CLUB.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boddy House, Toledo.

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

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7122 Stewart Ave., Chicago.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & R. R., Cleveland, Ohio. Next convention, September, 1917, Chicago.

WESTERN ASSOCIATION OF SHORT LINE RAILROADS.—Clarence M. Oddie, Mills Bldg., San Francisco.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

Traffic News

The Baltimore & Ohio has issued for the benefit of amateur gardeners using the railroad company's lands, and for others interested, a pamphlet giving practical instruction about spraying and other matters useful in killing insects which destroy vegetation.

The National Industrial Traffic League is distributing posters printed in the national colors which read as follows: "You can help win the war by conserving transportation facilities. Transportation is the life blood of the nation. Make one freight car do the work of two. Load and unload cars promptly; load and buy full capacity carloads; order only enough cars to take care of your needs."

The Nebraska State Railway Commission recently issued an order providing for a new scale of demurrage charges with a reciprocal feature, the conditions of which the railroads were required formally to accept on or before July 2. The new rules provide for a charge of \$2 per car per day for the first five days, after two-days' free time, a car is held by a shipper or a consignee, and \$5 for each succeeding day. Under the reciprocal feature the railroads will be fined \$2 per day for each car that they fail to move a distance of 50 miles within 24 hours.

The principal electric street railways of New York state, outside of New York City and Buffalo—29 companies—have petitioned the Public Service Commission, Second district, for authority to make a general increase in fares. These companies have formed a committee, of which Joseph K. Choate is chairman. The reasons adduced in the petition are similar to those which have been laid before the public by the steam railroads, and the most important factor is declared to be the practical impossibility of securing new capital for investment in street railroad properties.

The Department of Agriculture, reporting a shortage of cars in California, and calling attention to the unusually large crop of fruit expected on the Pacific Coast, this month and next month, quotes officers of the Pacific Fruit Express to the effect that the cars of that line were detained at Eastern markets, during the month of May, an average of *four days* after being placed on team tracks. There were also delays caused by holding cars in order yards for advice from the owners as to disposition. Fruit shipped from California in Pacific Fruit Express cars in two days, June 23 and 24, amounted to 897 carloads, an unprecedented movement.

H. I. Smith, vice-president of the Nashville, Chattanooga & St. Louis, has issued a circular to the shipping public discussing the freight car situation and expressing the purpose of the road to secure all reasonable advantages for its shippers from the activities of the committees now sitting at Washington and guiding the movements of freight traffic. Quoting from the latest bulletin of the Commission on Car Service, figures are given to show that the roads in Group 5—that in which the Nashville, Chattanooga & St. Louis is situated—had on their lines on June 1, only two-thirds as many box cars as they own. Mr. Smith expresses regret that it has been impossible to prevent serious disruption of customary practices and the unequal distribution of box cars; and suggests that shippers, in their own interest, make their position known to the government through the proper authorities.

Shippers Co-Operate to Increase Transportation Facilities

Progressive shippers throughout the country are showing their practical patriotism by conscientious efforts to increase the available car supply. Joseph T. Ryerson & Son, Chicago, recently issued a poster urging the prompt loading and unloading of cars, and the purchase and loading of full capacity carloads. The National Fertilizer Association, Chicago, is distributing 100,000 circulars and urging that fertilizers be ordered early to avoid the autumn congestion.

A record kept for the first 10 days in May by the Universal

Portland Cement Company, Chicago, showed an average load of 108.6 per cent of box car capacity, or a waste of only 1.4 per cent of available car space. In an article in the June number of the Universal Dealer, published by that company, Blaine S. Smith, general sales manager, urges heavier loading by all shippers, the construction of necessary warehouses and the purchase of large supplies of raw materials before the demands of the government reduce the car supply. The average freight car now carries only 43 per cent of its possible load, whereas in the majority of instances, it is feasible to increase the present average loading [of bulk freight] by 50 to 100 per cent. A slight quickening in the time of loading and unloading by shippers and consignees will mean a great saving.

Consolidate Shipments!

The Pennsylvania Railroad is distributing through station agents thousands of copies of the circular recently issued by the United States Department of Agriculture, calling for economy in the use of freight cars. The circular will be placed in the hands of farmers, truckers, fruit growers, shippers, consignees, brokers, buyers, boards of trade, chambers of commerce and merchants' associations.

This circular says in part:

"Shipping associations can pool the output of all their members and load cars of some commodities to full capacity for large markets. Wholesalers and carlot distributors can place orders for carloads of a greater quantity than was customary in the past. Shippers should load and unload cars within the shortest possible time. Against the increased value of a better market found while holding a car in transit must be balanced the loss due to deterioration of the product while the car is held and the sometimes greater loss of another shipper whose product spoils for lack of the car which the first shipper is holding. Potatoes in strong, double-headed barrels loaded in well ventilated box cars for destinations that can be reached within three or four days could be loaded safely considerably beyond the prescribed tariff minimum weights. Citrus fruits in many cases can be so loaded. Apples, especially when moving to storage points in the late autumn should be loaded to the space capacity of the car. Loading watermelons five deep instead of four would reduce the number of cars necessary to move the crop by one-fifth. A liberal use of straw underneath and between the melons, instead of merely sawdust underneath, and placing the larger melons at the bottom of the load would seem to make the plan feasible."

Fertilizer Association Urges Conservation of Cars

The soil improvement committee of the National Fertilizer Association, Chicago and Baltimore, has issued a circular appealing to buyers and shippers of fertilizers to co-operate in bringing about efficiency in the use of cars. The circular emphasizes particularly the importance of ordering fertilizers before the fall rush and of loading cars to maximum capacity. The circular reads in part as follows:

"The average carload shipment of fertilizer has been 21 tons. A standard box car will carry 50 tons. When freight cars are loaded to capacity with fertilizers, every car is doing double its ordinary work, and more than three times the work of a car loaded with 15 tons. Our military, industrial, agricultural and national welfare demands that we secure maximum efficiency by using this waste space.

"Shipments of fertilizers have been crowded into the rush seasons both spring and fall. It will be practically impossible for the railroads to move the fertilizer tonnage this fall in the six or eight weeks' period just before wheat and grass seeding begins. Avoid the harvest rush.

"The movement of troops, war supplies and military equipment is increasing rapidly, and the farmer must order early. Order early and order full carloads.

"Five railroad presidents constitute a permanent committee in Washington, and this committee is giving preference to fertilizers, seeds and agricultural implements and doing everything possible to render best service in delivering farm supplies. The willingness and co-operation of the railroads is not alone sufficient. The help of every farmer, dealer, agent and fertilizer company is necessary.

"There may be one objection to maximum loading of fertilizers. The bottom sacks will be compressed by the weight of the sacks above. Damage can be largely overcome, however, by handling the bottom sacks when the car is being unloaded so as to shake apart the compact fertilizer. The point to be remembered is that maximum loading is necessary in order that fertilizers be moved on time this year. There are likewise objections to early ordering by dealers. Storage space is frequently limited; but farmers who understand the conditions will render the dealer a service by hauling fertilizers away promptly on arrival.

"Duty is a bigger thing than right. We have a right to order fertilizer when we please and in such quantities as we please. It is our duty—and likewise our opportunity—to help every one and relieve the serious freight situation."

Passenger Trains Taken Off

The Pennsylvania's reduction in passenger train service, counting the changes on all divisions east of Pittsburgh, aggregates 102 trains, cutting down the passenger movement 2,268,000 train-miles a year, or about 6,500 train-miles every weekday. There is some consolidating of trains, and a number of parlor cars, restaurant cars, sleepers, club and observation cars will be taken off. The suburban service to and from larger cities will be preserved practically undisturbed for the present, and the summer schedules to and from seashore and mountain resorts have been arranged practically on the same basis as in recent years. There is not much freight on these lines and they are not likely to be needed for extensive troop movements.

Four trains between New York and Washington will be withdrawn, and the run of one will be shortened. Between Philadelphia and Washington, six trains will be withdrawn, namely, those leaving Philadelphia at 6:28 a. m., 10:30 a. m. and 1:20 p. m., and those leaving Washington at 10:00 a. m., 12:40 p. m. and 3:00 p. m. Club cars will be withdrawn from the trains leaving New York for Washington at 1:08 p. m., and leaving Washington at 8:00 a. m., and from the Colonial Express, north and south bound; also from some others. One night train from Philadelphia to Buffalo, and one from Buffalo to Philadelphia will be discontinued, reducing the through service between Philadelphia, Baltimore and Washington, and Buffalo, to one day train and one night train in each direction, instead of one day train and two night trains, as at present.

The rest of the changes consist mainly in readjustments and consolidation of trains which followed one another closely, and in the discontinuance of less important sleeping car lines. Among the latter are the New York-Cincinnati car, via Washington and Chesapeake & Ohio; New York-Birmingham car, via Southern Railway; New York-Charlotte car, via Southern Railway; and New York-Charleston and New York-Wilmington (N. C.) cars, via Atlantic Coast Line. The mid-day trains operated in former years during the summer months, between Pittsburgh and Buffalo, and leaving in each direction at 1:10 p. m., will not be placed in service this season, and the through sleeping car between Pittsburgh and Muskoka Lakes, via Toronto and the Grand Trunk, will not be put on.

Extensive changes of the same general character have been made on the Pennsylvania Lines West of Pittsburgh. On the Eastern division of the North West System, ten local trains are taken off, and on the South West System, eleven local trains.

On the New York Central, in the state of New York, the new timetables show about 90 fewer passenger trains than heretofore. This is said to be a reduction in passenger train mileage of about 5 per cent.

The Corporation Commission of North Carolina has approved the reduced passenger train service of the Southern Railway, after a conference and some modifications; and has approved the changes on the Atlantic Coast Line, with the exception of six trains. These six are: Numbers 72 and 73 between Weldon and Kinston, 56 and 57 between Plymouth and Tarboro, and 90 and 91 between Goldsboro and Rocky Mount.

J. H. Elliott, general manager of the Texas & Pacific, in a petition to the railroad commission of Louisiana asking for authority to discontinue the operation of a number of passenger trains, gives the average receipts of these trains; and the figures in some cases are as low as 32 cents a mile. Others are 39 cents, 41 cents, and 62 cents a mile. The commission promises to hold a hearing on the subject at Baton Rouge on July 17.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The Interstate Commerce Commission has further suspended until January 13 the tariffs proposing new reconsigning and diversion rules and charges.

The Interstate Commerce Commission has approved tariffs filed by the lake coal and ore-carrying railroads to restrict the reconsignment of hopper-bottom coal cars.

Embargoes on Grain at Baltimore

Baltimore Chamber of Commerce v. Baltimore & Ohio et al. Opinion by Commissioner Hall:

For the past two years the carriers owning export elevators at Baltimore, Md., have declared embargoes from time to time on grain for export. Two of them have adopted the practice of accepting such grain for transportation only upon assurance that a vessel will be available to receive the grain at the port. The complainant alleges that this practice is unreasonable, discriminatory and preferential; that the defendants' practices with respect to embargoes on shipments of corn are likewise unlawful; that the defendants' practice of declaring, modifying and suspending embargoes without sufficient notice to shippers has subjected certain persons to undue prejudice; and that prejudice also results from the defendants' practice of embargoing shipments of grain from certain territory while accepting grain from other territory.

The commission holds that under the transportation conditions which have obtained for many months, and in view of those which the existing state of war necessarily creates, a practice of accepting shipments of grain in bulk for export only upon satisfactory evidence that arrangements for its immediate exportation have been made is not inherently unreasonable or otherwise unlawful. But the practice complained of, as applied to shipments of grain in bulk to Baltimore for export, does not accomplish the results desired and unduly prefers the persons to whom permits are issued, because the use made of the permits is not adequately policed and safeguarded. If the permit practice is maintained, the defendants should submit within 60 days for the commission's approval rules, which will eliminate the unlawful features of the present practice.

The evidence of record with respect to embargoes on corn is too meager to warrant a definite finding as to the lawfulness of the defendants' practices in that respect.

The allegations that undue prejudice results from the defendants' failure to give advance notice of their embargo bulletins, and also from their practice of embargoing grain shipped from certain specified territory, are not sustained by the evidence. (45 I. C. C., 40.)

COURT NEWS

Discriminating Freight Rates

Back in 1905 a railroad agreed to give a lumber company a bonus equal to one-half the amount of its freight bills, in consideration of which the lumber company built mills which would greatly increase freight business and result in the building of a town. In an action by the lumber company for damages for the railroad's failure to observe the agreement, the Missouri Supreme Court holds that the agreement violated the interstate commerce act. The railroad called itself a promoter and the rebate a bonus, but, says the court, it could not thereby evade the statute. It gave the lumber company an advantage over other shippers. The promotion of town building, which would result in increased freight and passenger transportation, is beyond the legitimate powers of a common carrier. The interstate commerce act is not limited to fraudulent schemes and devices by which freight rates are reduced or rebates received, but covers every case where there is discrimination. The contract was held void and judgment for the plaintiff was reversed.—*Foster Lumber Co. v. Atchison, T. & S. F. (Mo.)*, 194 S. W., 281. Decided April 10, 1917.

Crossing Accident—Automobile Not Under Control

In an action for the death of the driver of an automobile when his car was struck squarely in the center by a train at a crossing, it appeared that the track was open to view 300 feet, in the direction from which the train came, at a point on the highway 48 feet from the crossing. The speed of the train was 37 miles an hour. There were marks on the road showing that the automobile had skidded before reaching the crossing, and indicating that the deceased had applied his brakes, but had approached the crossing at too high a speed. The Nebraska Supreme Court reversed a judgment for the plaintiff. It held that failure of the railroad company to ring the bell or blow the whistle, even though it may have been negligent, would not make the railroad company liable if deceased recklessly failed to have his car under control, and if by looking and listening at the proper time and place he could have seen the train in time to stop, and did not do so.—*Askey v. C. B. & Q. (Neb.)*. Decided May 9, 1917.

Service Provided by Tariff Rates Controls

A shipping contract covering a car of apples was made in the dead of winter, when both parties knew that zero weather was liable to come at any time. The published tariff offered the shipper of such property the opportunity of putting a stove in the car with a man in charge of it under certain conditions, but did not offer to warm or house the car itself. The shipper accepted a bill of lading including the words "owner's risk," so that the railroad's liability was limited to liability for negligence. The car, which was not heated, went through expeditiously, but the apples were badly frozen. In an action for damages the Wisconsin Supreme Court held the railroad not liable, and reversed a judgment for the plaintiff. The tariff, having been approved by the Interstate Commerce Commission, is absolutely controlling, and the railroad company is not permitted to give greater or less service than it provides.—*McGovern v. Ann Arbor (Wis.)*, 162 N. W., 668. Decided May 15, 1917.

Freight-Speed Law Held Legal in Nebraska

In an action to recover damages under provisions of a reciprocal demurrage act, which requires freight to be moved not less than 50 miles in 24 hours under liability for damages of \$1 per car for each day of delay, the Nebraska Supreme Court has sustained the plaintiff. The defendant railroad alleged that a statute prescribing a time limit for the movement of freight is in violation of the constitution of the United States and the constitution of Nebraska and that as Congress has authority over interstate commerce, all regulations of the state of Nebraska affecting the carriage of goods by railroad between states has been superseded; and the trains and cars referred to in the petition were engaged in interstate commerce. The court held that although the statute is inoperative as a regulation of interstate commerce it is valid and enforceable with reference to shipments originating and ending within the state. The defendant also claimed that it had placed the cars in question on a hold track at Omaha for delivery when convenient to the plaintiff at its three yards at Omaha and therefore delivery on the hold track constituted final delivery of the cars. The court held that if delivery on a hold track constitutes final delivery and the railroad refuses to place the cars at one of the plaintiff's own yards, the plaintiff would be remediless. Therefore, the statutory time should be computed up to the time when the cars are placed on the hold track and from the time orders are received from the consignee specifying the yard in which the cars should be placed, not counting the time the cars are on the hold track. To hold otherwise would be to defeat the very object of the statute, to wit: the prompt delivery of cars after arrival at destination. The defendant showed that its average movement of freight cars per day is in excess of the average for all the railroads of the country of about 24 miles and that, therefore, the statute is unreasonable; but the court denied the point, observing that these computations are based upon all freight cars, including those standing upon sidetracks or in yards; in storage at division stations, being repaired and in all other conditions, while the act applies only to freight cars which are in process of transportation, and therefore does not place an undue burden upon the carrier.—*Sunderland Brother Company v. Missouri Pacific Railroad*. Decided April 14, 1917.

Proximate Cause

In an action for personal injuries it appeared that the plaintiff intended to leave Mangum on a train scheduled to start at 6:45 p. m. He was five or six blocks from the station a few minutes before that time, and called the ticket agent over the telephone and asked about the train. He was told that it was late, and would not leave "until about 7:15 or later." He started for the station about 6:50. When he arrived within 75 feet of the station platform he saw the train moving out and ran and attempted to board it. He grabbed the iron railing about the steps with his left hand and the handhold on the gate with his right, and succeeded in getting both feet on the steps when the gate swung out and he fell off and rolled under the car and was injured. The Oklahoma Supreme Court held that, assuming that the agent gave incorrect information as to the time of departure of the train, and that the handhold of the gate was defective, and that these things constituted negligence on the railroad's part, it did not follow that such negligence was the proximate cause of the injury; and as the evidence failed to show that the injury was the proximate result and natural consequence of the negligent acts complained of, judgment for the plaintiff was reversed.—Wichita Falls & N. W. v. Cover (Okla.), 164 Pac., 660. Decided May 1, 1917.

Right to Use Tickets

A common carrier of passengers at common law had the right, independent of any statutory regulation, to impose the condition that only the purchaser of a ticket could use any portion of it, and this right continues under the Interstate Commerce Act, as amended by the Carmack amendment. A private individual sold a return trip ticket containing such a condition at a price less than the single fare. The ticket was validated by the company's agent for the return journey, but another agent found that the holder was not the original purchaser and took up the ticket. In an action against the company for its refusal to allow the plaintiff to return home on the ticket, the Kentucky Court of Appeals held that he had no right to use the ticket, especially in view of the fact that his use would be a violation of the Federal statute requiring uniform rates. The mere fact that the purchaser had the ticket validated by the agent gave him no greater right than had it never been validated, since the agent's validation was secured by fraud of the holder in representing himself to be the original purchaser.—Boston v. Southern Pacific (Ky.), 194 S. W., 814. Decided May 15, 1917.

Giving of Rebates

An interstate railroad company was the owner of coal lands which it leased in 1878 (and by renewals thereafter) to a mining company on a royalty basis. The coal produced therefrom was shipped over the company's road. From 1905 to 1913, and until the matter was called to the attention of the Interstate Commerce Commission, the railroad collected no royalties from the mining company, and made no charges on its books therefor, although the mining company produced above 1,500,000 tons of coal annually, which the railroad transported at the regular published rates. In a criminal prosecution by the government against the railroad for a violation of the interstate commerce law, the Circuit Court of Appeals, Second Circuit, held that if the arrangement made with the mining company constituted a device for effecting a reduction in rates, or for giving an advantage to the shipper, and was so intended, the railroad was guilty of a violation of the statute; and the question whether there was an intention to accomplish such a result was for the jury. As the jury found that such intention did exist, the railroad's guilt was held thereby established.

Hough, C. J., dissented on the ground that there was no evidence of violation of the act or of criminal intent, saying: "Under such a ruling a creditor who is also a carrier subject to the act is indeed between the devil and the deep sea. If all traffic is refused, the functions of a common carrier are abrogated; if traffic as per published tariff is accepted, a crime is said to be committed; if payment of debt is insisted upon as a prerequisite to the transport of goods, the debtor is broken, and both debt and traffic are lost until (at the best) some reorganization emerges from the ruins. The statute does not compel such result."—Northern Central v. United States, 241 Fed., 25. Decided February 27, 1917.

Equipment and Supplies

LOCOMOTIVES

THE CHICAGO, INDIANAPOLIS & LOUISVILLE has ordered 2 super-heater Mikado locomotives from the American Locomotive Company. These locomotives will have 28 by 30 in. cylinders and a total weight in working order of 285,000 lb. each.

FREIGHT CARS

THE FLORIDA EAST COAST is asking prices on 100 fruit cars.

MORRIS & Co. has ordered 20 tank cars from the American Car & Foundry Company.

THE AMERICAN CAST IRON PIPE COMPANY is in the market for 40 to 80 gondola cars.

THE GRAND TRUNK has ordered 1,000 box cars from the American Car & Foundry Company.

THE MARSH REFRIGERATOR SERVICE COMPANY, Milwaukee, Wis., will rehabilitate 675 cars in its own shops.

THE LOUISVILLE GAS & COAL COMPANY, through H. M. Bylesby, has ordered 25 hopper cars from the Pullman Company.

THE CHICAGO & NORTHWESTERN, reported in last week's issue as being in the market for 375 center constructions, has ordered this material from the American Car & Foundry Company.

MISCELLANEOUS

THE PHILADELPHIA & READING has awarded to Roberts & Schaefer Company, Chicago, the contract for the construction of a coaling station of 2,000 tons capacity at Erie avenue yards, Philadelphia. The plant will be of reinforced concrete construction, designed to serve six tracks, with two track hoppers each capable of receiving 125 tons of coal per hour. Facilities are also included for the drying and storage of sand. The contract price is \$205,000.

SIGNALING

THE PENNSYLVANIA is to install at Nanticoke, Pa., a mechanical interlocking, 8 levers, which has been ordered from the General Railway Signal Company.

THE ATLANTIC COAST LINE is to install at Java, S. C., a 12 lever interlocking machine, which has been ordered from the General Railway Signal Company.

THE NEW YORK CENTRAL has ordered from the General Railway Signal Company a mechanical interlocking machine, 40 levers, to take the place of one recently destroyed by a wreck at Dunkirk, N. Y.

THE CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS is to install at Indianapolis an electric interlocking machine having 48 working levers and eight spare spaces, bought of the General Railway Signal Company.

THE LONG ISLAND is to install at Manhattan Beach Junction, N. Y., an electro-mechanical interlocking machine with 16 electrical levers and 7 mechanical. The General Railway Signal Company furnishes the material.

THE MISSOURI KANSAS & TEXAS is to install at Ada, Okla., a mechanical interlocking machine with 19 working levers and five spare spaces. This machine has been ordered from the General Railway Signal Company.

THE HOUSTON & TEXAS CENTRAL is to install automatic block signals on its line near Hempstead, Tex., and has ordered from the Union Switch & Signal Company 23 one-arm and one two-arm low voltage Style "B" ground signals.

THE PITTSBURGH & LAKE ERIE has ordered from the Union Switch & Signal Company the materials for the installation of a c. automatic block signals on the New Castle division. There will be 18 style "T-2," top post signals, 110 volt, 60 cycle.

Supply Trade News

W. P. Steele has been appointed western representative of the American Locomotive Company, with headquarters in the McCormick building, Chicago, effective July 1.

The Steel Car Company, Cleveland, Ohio, has placed a new plant in operation for the repair of wooden cars. The company is planning to put up another building for the repair of steel cars.

The Barrett Company, New York, announces the appointment of T. A. Warton as representative of the railway sales department for the Cincinnati (Ohio) branch, with headquarters at 527 Carr street, Cincinnati.

Samuel Lindsay Nicholson, who has been sales manager of the Westinghouse Electric & Manufacturing Company since 1909, has been promoted to the position of assistant to vice-president, with headquarters at East Pittsburgh. Mr. Nicholson was born in Philadelphia, received his education in the William Penn Charter School of that city and began his business career as an apprentice with the Belmont Iron Works in 1887. He entered the electrical business the following year and served with various electrical companies until 1898, when he became sales representative of the Westinghouse Electric & Manufacturing Company, in New York. He subsequently had charge of the city and industrial division of the New York office. On the reorganization of the sales department in 1904, he was made manager of the industrial department, which position he filled until his selection as sales manager of the company in 1909.

Milton J. Whitson, Seattle, Wash., representative of the Grant, Smith Company, has been appointed construction manager in the quartermaster's department of the United States army for the building of cantonments.

D. B. Mungan, who was formerly in charge of the electrical department of the Illinois Central at New Orleans, La., has been appointed resident manager of the Edison Storage Battery Supply Company, with headquarters at 201 Baronne street, New Orleans.

H. D. Shute, whose election as vice-president of the Westinghouse Electric & Manufacturing Company was recently announced, will have executive charge of the company's commercial organization, both domestic and export, succeeding Vice-president L. A. Osborne, whose headquarters have been transferred to New York.

W. F. Walsh, of the railway export department of the Galen-Signal Oil Company, has received a commission as captain in the Engineer Reserves, United States army. Mr. Walsh was formerly with the Chesapeake & Ohio, and while with that company held a commission as first lieutenant of the Roanoke Blues of the Virginia National Guard.

The Walter A. Zelnicher Supply Company, St. Louis, announces the appointment of W. H. Dayton as city salesman. Mr. Dayton was formerly with the Railroad Supply Company, Chicago, as secretary and purchasing agent, and also eastern representative for five years. He went to St. Louis seven years ago, representing the same firm, and the Chicago Signal & Sup-

ply Company, and the Elyria Iron & Steel Company, manufacturers of signal and track maintenance materials.

The L. B. Stillwell Engineering Corporation has been organized to act as constructing engineer in the design and construction of steam and hydro-electric lighting, railway and power plants; electric transmission, electrification of railroads, the design and construction of steel rolling stock, railroad terminals, steam heating plants and general engineering construction work. The officers are: Lewis B. Stillwell, president; H. St. Clair Putnam, vice-president and general manager; Hugh Hazlton, vice-president, and W. Everitt Rundell, secretary and treasurer. The principal office of the corporation will be located at 100 Broadway, New York City.

L. C. Sprague, formerly general motive power inspector of the Baltimore & Ohio, with headquarters at Baltimore, has been appointed special representative on air brake specialties for the general railroad department of the H. W. Johns-Manville Company, with headquarters in New York. Mr. Sprague has been in railway service since 1899, serving on the Chicago, Burlington & Quincy from that time to 1910 as fireman, engineer and then fuel inspector. In 1912 he became a locomotive and air brake instructor for the International Correspondence schools, following which he was assistant general air brake instructor on the Great Northern at St. Paul. He became general motive power inspector of the Baltimore & Ohio in 1915.

TRADE PUBLICATIONS

AIR COMPRESSORS.—Bulletin 34-Y, recently issued by the Chicago Pneumatic Tool Company, is a catalogue of that company's gas and gasoline driven air compressors.

EXPORT ENGINEERING AND CONTRACTING.—This is the title of a booklet recently issued by the American Steel Export Company, New York. The book explains about the export organization of the company itself, and gives a detailed list of the many kinds of equipment it is in a position to design and supply.

BALL BEARINGS.—"Hess-Bright Ball Bearings—How to Apply Them," is the title of a booklet recently issued by the Hess-Bright Manufacturing Company, Philadelphia, for the purpose of showing what precautions should be taken to preserve the "inherent efficiency and superiority" of Hess-Bright ball bearings. The booklet emphasizes the necessity of clean bearings and proper lubricants, the care that should be taken to prevent overloading, and the necessities of proper mounting. A number of drawings are given to bring out the points in the text. Another and similar booklet issued by the same company deals with the application of ball bearings to the airplane.

PEROLIN.—The Perolin Railway Service Company, St. Louis, Mo., has recently issued a small booklet descriptive of "Perolin—the Boiler Metal Treatment." The catalogue explains that this product is a mechanical rather than a chemical treatment, drawing attention to the fact that "A steam boiler is a steam generator—not a kettle for chemical reactions." It is brought out that Perolin has a high affinity for the hot metal and a high co-efficient of expansion, whereby it works by creeping in between the metal and the scale, and then forces the scale loose. The booklet further shows how the Perolin is used, and quotes the company's guarantee as to its effectiveness.

GRINDING AND POLISHING MACHINERY.—A 120-page catalogue has just been issued by the Gardner Machine Company, Beloit, Wis., covering the line of grinding machines, abrasive material and accessories. The catalogue is a 7-in. by 10-in. book, bound in heavy paper board and printed on an excellent quality of coated paper. The catalogue contains an introduction dealing in a general way with the features of design of the Gardner line, and several pages of value to the user of grinding wheels and materials. The body of the catalogue contains descriptions of the various machines and accessories, profusely illustrated, as well as illustrations of numerous installations in actual service. The usual information covering prices, specifications and code is contained in tables at the back of the book. The machines illustrated include disk grinders for metal, disk grinders for pattern shops, ring wheel grinders, band finishing machines, polishing and buffing lathes, ring wheel chucks, fixtures for disk grinders, abrasive disks, cloth and paper, and other accessories.



S. L. Nicholson

Railway Construction

BALTIMORE & OHIO.—This company, in conjunction with the Cleveland, Akron & Cincinnati, the Akron-Barberton Belt Line and the city of Barberton, Ohio, has completed plans for the construction of a concrete steel viaduct on East Tuscarawas avenue. The structure will cost approximately \$206,000, of which the railroads will pay 65 per cent and the city and county the balance. Bids will be received for the work until noon on July 9.

CHICAGO, INDIANAPOLIS & LOUISVILLE.—This road will make changes in its yards at La Fayette, Ind., involving the shifting of tracks and an expenditure of approximately \$35,000.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—This company has let a contract to C. G. Mitchell & Sons, Charleston, Ill., for the erection of a freight house at Middleton, Ohio. The building will be 22 ft. high, 40 and 80 ft. wide and 290 ft. long, with brick walls, wood trusses and Barret specification roof—in short, a slow burning construction with metal laths and plaster in the office portion. Approximate cost \$40,000.

This company has completed plans for the erection of a passenger station at Charleston, Ill., to replace the old building which was destroyed by a cyclone. The new building will be a one-story wood structure, 78 ft. by 38 ft., with an additional canopy and express room 45 ft. by 21 ft. Bids on this work will be asked for shortly.

ILLINOIS CENTRAL.—This company is completing plans for the building of a freight house and office building at Champaign, Ill. The building will be of brick construction with concrete foundation and slate roof, and will cost approximately \$40,000. The total length will be 340 ft., of which 250 ft. will be one story high, and the remaining 90 ft. two stories. In addition to this there will be 130 ft. of covered platform. The road is also drawing preliminary plans for a power house at the same point. It will be 48 ft. wide and 60 ft. long, of brick construction, and will cost about \$15,000. Bids will not be asked on the freight house until the power house plans are completed. The building of a freight house and office building at Kankakee similar to the proposed Champaign structure is contemplated.

NEW YORK CENTRAL.—This company is contemplating track elevation work at South Bend, Ind. As the plans are not yet completed, no data can be given at this time.

This company has ordered that the work on the bridge and connecting railroad crossing the Hudson river at Castleton, N. Y., nine miles south of Albany, be continued. On the passage, last month, of a law, by the New York legislature, which would forbid the construction of a two-span bridge at this point, some of the preliminary operations were suspended. (*Railway Age Gazette*, February 2, 1917, page 192, and June 8, 1917, page 1205.)

NORTHERN PACIFIC.—This company has let a contract to the Clifton, Applegate & Toole Construction Company, Spokane, Wash., for the construction of an extension to the Cowiche branch. The present line extends from North Yakima, Wash., to Weikel. The extension will be seven miles long, beginning at Weikel, and will cost approximately \$200,000.

The engineering department of this company, in conjunction with C. Claussen, city engineer of St. Paul, Minn., is drawing preliminary plans for an ore dock on the Mississippi river below Indian Mounds (St. Paul), Minn. The dock will be 600 ft. long with 1,100 ft. of approach trestle, and will have a capacity of 6,000 tons. The superstructure will be of wood pile trestle, and the distance from the water surface to the track level will be about 30 ft.

UNION PACIFIC.—This company has awarded a contract to the Eberhardt Construction Company for the construction of a new freight depot at Salina, Kan. The building will be of reinforced concrete and absolutely fireproof. In addition, the road will build one new track, which work will be handled by R. L. Huntley, chief engineer, Omaha, Neb. The total cost of improvements will approximate \$100,000.

Railway Financial News

CHICAGO GREAT WESTERN.—E. N. Hurley has been elected a director to succeed John R. Morron, resigned.

CHICAGO, ROCK ISLAND & PACIFIC.—Fred. W. Scott, of Richmond; Beman G. Dawes and James A. Patten have been elected directors, succeeding Seward Prosser, Charles G. Dawes and S. Davies Warfield, resigned. B. G. Dawes, Mr. Patten, E. K. Boist and James E. Gorman were elected members of the executive committee. Mr. Scott and James Speyer were elected members of the finance committee.

CINCINNATI, HAMILTON & DAYTON.—Judge Howard Hollister in the U. S. District Court at Cincinnati has set aside the sales of the Ironton and Delphos divisions on the ground that the court had no authority to order the sale of these two properties in parcels. The sale of the main line is not affected by the court's order as this sale was recently confirmed.

HOUSTON & TEXAS CENTRAL.—See Southern Pacific.

NORTHERN PACIFIC. Howard Elliott has been elected a director and a member of the executive committee. Mr. Elliott was president of this road prior to September, 1913, when he resigned to become president of the New York, New Haven & Hartford. His resignation from the New Haven took place on May 1, 1917. Besides being a director of the Northern Pacific, Mr. Elliott is a member of the executive committee of the American Railway Association Special Committee on National Defense.

SAVANNAH & ATLANTA. The Secretary of State of Georgia, Philip Cook, has granted the petition of this company to amend its charter providing for an increase of capital stock from \$500,000 to \$2,250,000, this issue of securities being for the consolidation of the Savannah & Northwestern, with the Savannah & Atlanta under the name of the latter road. Of the \$2,250,000 capital stock, \$1,250,000 is to be preferred stock, bearing 7 per cent non-cumulative dividends until October 1, 1920, after which date the dividends become cumulative. The remaining \$1,000,000 is to be common stock, privileged to redemption at \$102 at any time upon majority vote of the outstanding common stock. The Savannah & Atlanta was chartered in Georgia, December 8, 1915, to build an extension of the Savannah & Northwestern from St. Clair, Ga., northwest to Camak, 35 miles.

SAVANNAH & NORTHWESTERN.—See Savannah & Atlanta.

SOUTHERN PACIFIC.—In a majority opinion by Judges Ward and Rogers, the United States Circuit Court of Appeals has affirmed the decree of Judge Chatfield requiring the Southern Pacific to deliver to the minority stockholders of the Houston & Texas Central their proportionate share of the stock of the reorganized company and the dividends collected thereon upon the payment of \$26,026 a share and interest from February 10, 1891. The litigation of twenty-five years' standing has been marked by a long series of unsuccessful suits on the part of the minority stockholders to recover their property on the ground that the foreclosure of the mortgage on the various lines of the Houston & Texas Central has been brought about by the Southern Pacific by fraud.

SWEDISH RAILWAY CONSTRUCTION.—An extension is planned by the Göteborg-Säro Railway, extending southeast from the west coast to Landeryd, 122.6 kilometers (76 miles), at an estimated cost of 13,000,000 crowns (\$3,484,000).

ITALIAN STATE RAILWAY RETURNS.—According to figures presented in the daily press, the receipts of the Italian State Railways for the fiscal year 1915-16 amounted to 849,450,715 lire (\$120,622,002), or 229,352,083 lire (\$32,567,996) more than in the preceding year, and expenses totaled 819,964,378 lire (\$116,434,942), an increase of 178,900,548 lire (\$25,412,378). The cost of maintenance was reduced in 1915-16 to 76.78 per cent, from 81.26 per cent in 1914-15.

Railway Officers

Executive, Financial, Legal and Accounting

Oran Perry has been appointed assistant to the receiver of the Evansville & Indianapolis, with office at Indianapolis, Ind.

O. W. Wheelless, auditor of the Warren & Ouachita Valley, has been appointed also freight claim agent, with headquarters at Warren, Ark.

P. J. Riegger has been appointed general auditor of the La Crosse & Southeastern, with office at La Crosse, Wis., vice S. J. Lennon, resigned to accept a position elsewhere.

William M. Jeffers, general manager of the Union Pacific, has been appointed also vice-president, effective July 1. He was born at North Platte, Neb., on January 2, 1876, and entered railway service in June, 1890, as an office boy with the Union Pacific. In 1892 he was promoted to telegrapher, and one year later became a clerk in the maintenance of way department. From 1894 to 1895 he was clerk and telegrapher, and in 1898 he was promoted to train despatcher; in 1900 he was chief despatcher, and in November, 1905, he became trainmaster. On November 11, 1908, he became assistant superintendent of the Utah division, and served consecutively until February 22, 1915, as superintendent of the Utah division, superintendent of the Wyoming division, and superintendent of the Nebraska division. On November 1, 1915, he was promoted to general superintendent, and on June 3, 1916, was appointed general manager, with headquarters at Omaha, which position he will continue to hold in addition to that of vice-president.

W. D. Beymer, controller of the Central of Georgia, with headquarters at Atlanta, Ga., has been appointed controller of the Illinois Central, with headquarters at Chicago, succeeding M. P. Blauvelt, resigned.

C. A. Goodnow, assistant to president of the Chicago, Milwaukee & St. Paul, has been appointed vice-president, with headquarters at Chicago. G. J. Bunting, general auditor at Chicago, has been appointed controller with the same headquarters.

H. A. Osgood, whose appointment as assistant to the vice-president of the Wabash, in charge of operation, was announced in the *Railway Age Gazette* of June 8, was born at Minneapolis, Minn., on April 9, 1885. He graduated from Harvard University in 1906, and in the following year entered railway service with the Wabash, at St. Louis, Mo., in the general freight department. In April, 1911, he became secretary to the manager of the transportation department and of the transportation and maritime affairs' committee of the Boston Chamber of Commerce. In 1912 he was traffic manager of the Keokuk division of the Stone & Webster Engineering Corporation, at Keokuk, Iowa. He returned to the Wabash in the summer of 1912 as statistician in the general freight department, at the same time serving as statistician for the Central Freight Association roads in the 5 per cent case. In January, 1916, he was loaned to the Central Freight Association lines to assist in special cost of service studies made on the Cleveland, Cincinnati, Chicago & St. Louis, and the Pittsburgh, Cincinnati, Chicago & St. Louis. On June 1 he was appointed assistant to the vice-president, with headquarters at St. Louis.



W. M. Jeffers

George Wheeler Feakins, whose appointment as assistant to president of the El Paso & Southwestern, with headquarters at New York, has already been announced in these columns, was born on May 12, 1876, at Cherry Valley, Ill., and was educated in the district school. He began railway work in October, 1892, as a stenographer in the office of the superintendent of machinery on the Atchison, Topeka & Santa Fe, at Topeka, Kan., and the following May resigned to become a clerk in the maintenance and construction department of the Rock Island at Topeka. On March 1, 1895, he was transferred to the general freight office, and in July, 1897, was again transferred to the commercial agency of the Rock Island at Salt Lake City. He was appointed traveling freight agent in March, 1898, and in October of the following year went to the Colorado Midland as traveling freight and passenger agent. On October 1, 1903, he returned to the service of the Rock Island as traveling freight agent at Buffalo, and in May, 1909, became chief clerk to the general traffic manager of the El Paso & Southwestern at Chicago. He was appointed assistant to general traffic manager in January, 1912, and was transferred to St. Louis on February 1, 1913, as general agent, which position he held at the time of his recent appointment as assistant to president of the same road, as above noted.

Operating

J. T. Gillick, assistant to the general manager of the Chicago, Milwaukee & St. Paul, at Chicago, has been appointed assistant general manager, with the same headquarters, effective July 1.

John Downing Bourne, who has been appointed superintendent of the Berkshire division of the Boston & Maine, with headquarters at North Adams, Mass., as has already been announced in these columns, was born on August 13, 1879, at Kennebunkport, Me. He was educated in the common schools and at Pembroke Academy, Pembroke, N. H. He began railway work on June 18, 1896, with the Boston & Maine, and served to 1901 on the Southern, the Concord, the Northern and Worcester divisions of the same road, consecutively as yard clerk, ticket agent, and telegrapher in the train despatcher's office and station agent at different places. From 1901 to 1907 he was train despatcher on the Fitchburg division at Mechanicville, N. Y., and then to 1911 was chief train despatcher at North Adams, Mass. He was promoted to trainmaster of the same division at North Adams, Mass., in 1911, and subsequently served as trainmaster at Boston, Mass., until his recent appointment as superintendent of the Berkshire division of the same road, as above noted.



J. D. Bourne

E. F. Kultechar, roadmaster on the Ottumwa division of the Chicago, Burlington & Quincy, with headquarters at Osceola, Ia., has been promoted to trainmaster on the La Crosse division, with headquarters at La Crosse, Wis.

E. S. Moore has been appointed superintendent of transportation of the Norfolk & Western, with office at Roanoke, Va., vice D. E. Spangler, promoted, and J. R. Talbott has been appointed superintendent of car service, with office at Roanoke.

Charles Marshall, superintendent of the New Orleans & Mobile division, and of the Louisville & Nashville at New Orleans, La., will retire from active service on August 1, 1917, after a connection of 50 years with this road and its predecessors.

G. H. Alexander, superintendent of car service of the New York Central, at New York, has been appointed superintendent of freight transportation, lines east of Buffalo, with headquarters at New York, vice C. H. Ewings; and G. J. Ross, car accountant

at New York, has been appointed superintendent of car service of the lines east and west of Buffalo, with headquarters at New York, vice Mr. Alexander.

J. T. McShane, trainmaster on the Chicago, Burlington & Quincy, at Sheridan, Wyo., has been promoted to superintendent of the Sterling division, with headquarters at Sterling, Colo., succeeding W. G. Dungan, transferred; H. D. Brown, trainmaster at Wymore, Neb., has been transferred to Sheridan, succeeding J. T. McShane; H. J. Hoglund has been promoted to trainmaster at Wymore, succeeding H. D. Brown, transferred, and L. O. Murdock has been promoted to trainmaster at Lincoln, Neb., vice J. G. Dally, transferred. These appointments became effective on July 1.

A. H. Webb, whose appointment as general superintendent of the western district of the Missouri Pacific, with headquarters at Kansas City, Mo., was announced in the *Railway Age Gazette* of June 28, entered railway service with the Missouri Pacific in 1877 as a freight brakeman and conductor. In 1884 he was promoted to trainmaster, with headquarters at Little Rock, Ark., and two years later became assistant superintendent of the Wichita division. In 1894 he was promoted to superintendent of the Wichita division, and continued in that position until his recent appointment as general superintendent, succeeding Albert De Bernardi, resigned.

Carlos Glenn Stevens, whose appointment as superintendent of the Illinois division of the Baltimore & Ohio, with headquarters at Flora, Ill., has already been announced in these

columns, was born on December 16, 1870, at Sumner, Ill. He began railway work on August 15, 1885, as assistant agent on the Ohio & Mississippi, which later became a part of the Baltimore & Ohio Southwestern. From July, 1887, to November, 1889, he served as agent at Claremont, Ill., and then to September, 1893 was operator and despatcher on the Missouri, Kansas & Texas. In March, 1894, he was appointed despatcher on the Baltimore & Ohio Southwestern; in March, 1902, he was promoted to night chief despatcher, and in October, 1904, became chief despatcher. On May 10, 1910, he was appointed assistant trainmaster, and in January, 1911, was promoted to trainmaster, which position he held at the time of his recent appointment as superintendent of the Illinois division of the Baltimore & Ohio, as above noted.

F. I. Ford, superintendent of terminals of the Chesapeake & Ohio at Newport News, Va., has been appointed superintendent of the Newport News terminal division, with headquarters at Newport News, in charge of the territory east of Mile Post 14, including the North Terminal and Hampton branch; W. S. Taylor, superintendent of terminals at Covington, Ky., has been appointed superintendent of the Cincinnati terminal division, with headquarters at Covington, in charge of the territory from Silver Grove, Ky., to Summit, Ohio, including both yards; A. T. Lawmaster, general agent at Chicago, has been appointed superintendent of terminals, with headquarters at Chicago, and his former position has been abolished.

W. E. Fuller, assistant superintendent on the Chicago, Burlington & Quincy, with headquarters at Dayton's Bluff, Minn., and St. Paul, has been appointed inspector of transportation, with headquarters at Chicago; M. B. Lamb, assistant superintendent of the Beardstown division, at Beardstown, Ill., has been transferred to the St. Paul division, with headquarters at Dayton's Bluff, succeeding W. E. Fuller, promoted. J. H. Aydelott, trainmaster at La Crosse, Wis., has been promoted to superintendent of the Hannibal division, with headquarters at

Hannibal, Mo., succeeding Nathaniel L. Howard, who has entered military service as a lieutenant-colonel in the Third Reserve Engineers, now stationed at Chicago. J. D. Farrington, trainmaster at Ottumwa, Iowa, has been promoted to assistant superintendent of the Ottumwa division, with headquarters at Burlington, Iowa, succeeding F. E. Haines, transferred to the Beardstown division.

Albert De Bernardi, whose appointment as general manager of the Kansas City, Mexico & Orient, was announced in the *Railway Age Gazette* of June 22, was born near Independence,



Albert De Bernardi

Mo., on July 28, 1865, and entered railway service in May, 1882, as a laborer in the maintenance department of the Missouri Pacific. In May, 1885, he became a section foreman, following which he was consecutively until September, 1893, foreman of an extra track gang, freight brakeman and foreman of a construction train. On the latter date he was promoted to division roadmaster at Nevada, Mo., and in December, 1899, he became trainmaster at that point. From February, 1900, to August, 1911, he served

successively as division superintendent at Concordia, Kan.; superintendent at Osawatimie; general superintendent of the central district, with headquarters at Coffeyville; general superintendent of the southern district at Little Rock, Ark.; superintendent of the Omaha and northern Kansas divisions at Atchison; and superintendent of the Omaha division at Falls City, Neb. On August 10, 1911, he was appointed general superintendent of the western district, with headquarters at Kansas City, Mo., and he served in that capacity until his appointment as general manager of the Kansas City, Mexico & Orient, as already noted.

D. E. Spangler, superintendent of transportation of the Norfolk & Western at Roanoke, Va., has been appointed general superintendent of transportation, with headquarters at Roanoke. Mr.



D. E. Spangler

Spangler was born on May 31, 1863, at Circleville, Ohio, and graduated from the high school in his native town, in June, 1879. The following August he began railway work as warehouseman and loading clerk on the Scioto Valley railroad, now a part of the Norfolk & Western, and since that time was, consecutively, to June, 1880, in various clerical positions on the same road. He was then to February, 1882, telegraph operator, and from February, 1882, to August, 1883, station agent. From August, 1883, to November, 1891,

he was train despatcher, and then to November, 1897, was chief train despatcher. On November 15, 1897, he was appointed trainmaster, and in December, 1898, became car service agent. He remained in that position until October, 1903, when he was appointed superintendent of transportation, and now becomes general superintendent of transportation of the same road, as above noted. Mr. Spangler's entire railway service has been with the Scioto Valley and Norfolk & Western.

Walter L. Booth, whose appointment as general superintendent of transportation of the Chesapeake & Ohio, with headquarters at Richmond, Va., has already been announced in these columns, was born on October 17, 1880, at Richmond, and was educated in the public schools and at Richmond College (Va.). He began railway work in September, 1897, with the Chesapeake & Ohio, and served in various positions in the accounting and operating departments. In 1910 he was appointed assistant trainmaster, and subsequently served consecutively as trainmaster, assistant superintendent, and then as superintendent on various divisions of the same road, and on the Chesapeake & Ohio of Indiana. He was then appointed superintendent of freight transportation, and on June 1 was appointed general superintendent of transportation of the Chesapeake & Ohio and the Chesapeake & Ohio of Indiana, with headquarters at Richmond, Va., as above noted.

Traffic

Sherman H. Gillette, whose appointment as assistant general freight agent of the Chicago & North Western, with headquarters at Chicago, Ill., succeeding Edward J. Seymour, retired, was announced in the *Railway Age Gazette* of June 15, was born at St. Charles, Ill. He entered railway service with the C. & N. W., as a messenger and studied telegraphy at night school. He was later promoted to night telegraph operator at Milton Junction, Wis., following which he became day operator at the same town. He was next promoted to cashier and agent at Sheboygan Falls, where he remained until appointed traveling freight agent. A short time after he was promoted to chief clerk in the general freight department, which position he held until his promotion to assistant general freight agent, as above noted.



S. H. Gillette

D. A. Story, whose appointment as freight traffic manager of the Canadian Government Railways, with headquarters at Moncton, N. B., has already been announced in these columns, was born on October 26, 1853, at Halifax, N. S., and was educated in the common schools. He began railway work on May 27, 1869, with the Nova Scotia Railway at Halifax, N. S., and in November, 1872, was transferred to Moncton, N. B., as clerk to the general freight agent, with its successor, the Intercolonial. In April, 1876, he was appointed clerk at Halifax; the following year he became accountant; then in July 1, 1894, was appointed agent, and in September, 1898, was promoted to division freight agent at Halifax. In September, 1907, he was appointed general freight agent at Moncton, N. B., and on June 1 became freight traffic manager of the Canadian Government Railways, as above noted.



D. A. Story

Hargrave Henry Muehall, whose appointment as assistant general passenger agent of the Missouri Pacific, with headquarters at St. Louis, Mo., was announced in these columns on June 8, was born in Belleville, Ont. He entered railway service with the

Canadian Pacific as a messenger in the local freight office at Winnipeg, Man. He was later consecutively private secretary to the general freight agent at Winnipeg; stenographer to the general passenger agent of the Duluth, South Shore & Atlantic, at Marquette, Mich.; chief rate clerk on the Minneapolis, St. Paul & Sault Ste. Marie and the D. S. & A., at Minneapolis, Minn.; and rate clerk on the Lake Shore & Michigan Southern, at Washington, D. C. In 1894, he went with the Missouri Pacific as rate clerk and was later, consecutively, assistant chief rate clerk, chief rate clerk and chief clerk until his appointment as assistant general passenger agent, as above noted.

Jonas Waffle, assistant general freight agent of the Chicago, Milwaukee & Gary, at Chicago, has been appointed general freight and passenger agent, with the same headquarters, effective July 1. The office of assistant general freight agent is abolished.

Engineering and Rolling Stock

J. C. Jeffries, roadmaster on the Atchison, Topeka & Santa Fe at Plainview, Tex., has been appointed division engineer, with headquarters at Clovis, N. M., succeeding C. B. Clegg, assigned to other duties, effective June 16.

B. B. Milner, engineer of motive power of the New York Central, at New York, will hereafter also perform the duties heretofore performed by the chief mechanical engineer, R. B. Kendig, deceased. The office of chief mechanical engineer has been abolished.

J. E. Bernhardt, whose appointment as bridge engineer of the Chicago & Eastern Illinois, with headquarters at Chicago, Ill., was announced in the *Railway Age Gazette* on June 8, was born in Terre Haute, Ind., on May 11, 1887. He graduated from Rose Polytechnic Institute in 1908. He entered railway service with the Vandalia in the summer of 1906. From June, 1908, to January, 1909, he was in the employ of Libby & Nelson, contractors, at Minneapolis, Minn. In January, 1909, he returned to the Vandalia, and in July of the same year went to Big Stone Gap, Va., where he was a mining engineer. In April, 1910, he was in the bridge department of the Chicago, Milwaukee & St. Paul, at Chicago. In September, 1910, he went to the Chicago & Eastern Illinois as a draftsman, and was successively chief draftsman and assistant engineer in charge of bridges until his promotion to bridge engineer.

Purchasing

Benjamin S. Hinckley, who has resigned as purchasing agent of the Boston & Maine, at Boston, Mass., to go into other business, as has already been announced in these columns, was born on November 18, 1875, at Charlestown, Mass., and graduated in 1899 from the Massachusetts Institute of Technology. He began railway work on August 1, 1899, with the Northern Pacific, and from April, 1906, to June, 1907, was chief inspector of the test department of the New York, New Haven & Hartford. He then served as engineer of tests on the same road until July, 1911, when he was appointed purchasing agent of the Boston & Maine, with headquarters at Boston, Mass.

August W. Munster, whose appointment as purchasing agent of the Boston & Maine, with headquarters at North Station, Boston, Mass., has already been announced in these columns, was born on July 24, 1882, at Waltham, Mass. He was educated in the Massachusetts Institute of Technology, and in 1904 began railway work with the Northern Pacific, where he served as a machinist and material inspector. In 1909, he went to the New York, New Haven & Hartford as material inspector, and subsequently served as chief inspector and engineer of tests. In 1911 he went to the Boston & Maine as general storekeeper, which position he held at the time of his recent appointment as purchasing agent of the same road, as above noted.

Railway Officers in Military Service

Stuart C. Leake, commercial agent of the Richmond, Fredericksburg & Potomac, at Richmond, Va., has received a commission as captain in the Quartermasters' corps of the United States army, and is now awaiting orders for service.

OBITUARY

John E. Budd, division passenger agent on the Chicago & Eastern Illinois, at Terre Haute, Ind., died recently at his home in that city following an operation.

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GENERAL NEWS SECTION

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The railroads have long realized that grade-crossing accidents cannot be reduced appreciably until full responsibility

A Forward Step in Accident Prevention

is placed not only on the railway companies but on the public as well. Unfortunately, this view has not been so generally held by governmental authorities, with the result that every addition

to the number of grade-crossing accidents has increased the payments of railroad claim departments and swelled the clamor for grade separation. It is, therefore, decidedly encouraging to learn that a Cook County (Ill.) coroner's jury recently rendered a verdict which recognizes that the persons using highway crossings may be entirely to blame for a grade-crossing accident and, when this is the case, should be severely punished. On May 13 an automobile was struck by a Chicago, Rock Island & Pacific passenger train at Midlothian, Ill., with fatalities to six occupants of the motor car and injuries to the driver. The circumstances, described elsewhere in this issue, were such that the coroner's jury found the driver guilty of carelessness equivalent to criminal negligence and manslaughter, and bound him over to the grand jury with a recommendation that he not be released without due process of law. The members of this jury are to be commended on taking a step which will have far-reaching effects in the interests of accident prevention. It is hoped that this verdict will impress upon chauffeurs that prison cells may await those who are recklessly indifferent to danger, even when a railroad is involved.

The following letter has been received from the passenger traffic manager of a large railway system: "I have been interested recently by *Railway Age* editorials on dining car waste of food, and have been wondering why a la carte has been charged with the

A la Carte Versus Table d'hote

fault of food waste and table d'hote credited with saving food, whereas the contrary has been proved in every case. We have experienced both methods, and for many years operated our dining cars on the table d'hote plan, which requires not only the preparation in advance of a lot of food, much of which is not used, but permits the passenger to order many things not wanted,

which are merely tasted, and have to be thrown away, and allows the waiter to bring food not ordered, but which he thinks may assist in obtaining a larger tip. The waste of a steamship on the table d'hote plan is not so great proportionately as in the dining car or in a hotel, for the reason that the crew has to be fed, and owing to the conditions of such service can be fed less expensively than dining car help or hotel help. If in certain dining cars too large portions are served, it is not the fault of the a la carte system, but the fault of the head of the dining car department, who does not arrange to cut down the size of the portions. Our practice has been to serve a reasonable sized portion, but even this method has not kept down the prices, which have had to be raised owing to the great advance in the cost of food." The editorials referred to were not meant to condemn the a la carte system on dining cars as necessarily more wasteful than the table d'hote, but rather the wastes which occur under the a la carte system as it has been operated on most railways. Under the present condition the system which will best conserve foodstuffs is the one which should be used; and experienced railway officers are the best judges as to which will the more effectively further that object.

In many cases it is the receiver of freight who specifies the quantity shipped as a carload. The receiver of freight

The Interstate Commerce Com- mission Can Help

is even harder to reach and to get co-operation from in the matter of heavier carloading than the shipper. A very interesting suggestion has been made by a large shipper in Texas who, while

expressing himself as glad to co-operate with the railroads in using any circulars on heavier carloading and distributing them among receivers of freight, makes the point that any marked activity on the shippers' part will probably be taken as merely an endeavor to increase the size of sales. The receiver of freight even more than the shipper of freight suspects a railroad of merely trying to serve its own ends when heavier carloading is urged by the railroad company itself. It is a well known fact that an impartial outsider can recommend a certain course to one of two parties who have continuous business dealings and get an open-

mind consideration that would not be accorded to the same recommendation made by one of the interested parties. The Interstate Commerce Commission is looked upon by the shippers as impartial, at least, if not actually an ally of the shippers. It has a standing and its recommendations carry a weight with shippers and receivers of freight as well as with the general public that is unique. In the present crisis a strong recommendation made by the Interstate Commerce Commission to shippers and receivers of freight that they co-operate with the railroads in their efforts toward getting heavier carloading would be of immense value; a general appeal by the Interstate Commerce Commission would be heeded by a vast number of receivers and shippers of freight who would look upon the appeal by the railroads themselves simply as a business move, to be met as any other business move would be met. Might it not be possible, feasible and proper for the Interstate Commerce Commission to make such an appeal? The Commission has on some occasions issued circulars, addressed jointly to carriers and shippers, urging prompt loading of cars and prompt movement, but has never, so far as we know, made an appeal for the full use of car space. The question is important enough to the nation to justify such an appeal. Would not this be a constructive piece of work for the Interstate Commerce Commission to undertake?

INCREASED RAILROAD EFFICIENCY REDUCED THE CAR SHORTAGE

THE statistics now available demonstrate that the reduction of the net car shortage from 148,627 cars on May 1 to 105,127 on June 1, or about 30 per cent, was due to increased efficiency in railway operation, because they show that it was accomplished in spite of a large increase in freight traffic in May.

While statistics regarding the volume of traffic handled in May are not yet available in complete form, an indication of the increase in the amount of business for which the railroads were called upon to furnish cars in that month is afforded by the freight earnings of the roads that have already reported their monthly earnings to the Interstate Commerce Commission. One hundred and forty-eight roads in all parts of the country have filed their May earnings reports with the Commission, and these roads showed an increase in freight revenues of 10.14 per cent in May as compared with April. This increase in freight revenue indicates a corresponding increase in the total amount of freight carried, and is the best possible evidence of the results being gained from the work of the Railroads' War Board and its subcommittee, the Commission on Car Service, in co-ordinating the facilities of the railroads for the purpose of increasing their efficiency during the war. It also shows that they are receiving increasing co-operation from shippers in loading cars heavily and in loading and unloading them more quickly. The new car service regulations, under which box cars are virtually pooled, were put into effect by order of the Railroads' War Board on April 26, and since that time the Commission on Car Service has ordered those railroads on which cars have accumulated in congested territories to turn over to roads on which there has been a shortage, cars to the number of over 56,000, which have been sent largely in full trains to the points where they have been most needed.

The Railroads' War Board has also received reports indicating a considerable increase in efficiency on the part of the railroads in April. Figures from 51 per cent of the mileage of the railroads in the United States show that they carried over three billion more tons of freight one mile in April, 1917, than they did in April, 1916, an increase of 16 per cent, and that this was done with an increase of but

4.3 per cent in locomotive miles and with but 5 per cent more freight car miles. The average train load was increased 66 tons—a remarkable achievement—and the average carload was increased 2.4 tons.

These figures for April and May make a very good showing of increased efficiency gained under the greatest difficulties; but they should not cause any misleading optimism. With railway traffic continuing to increase at the rate it is, it is evident that even though the railways and shippers use the transportation facilities available to the best purpose possible, there probably will be another big car shortage and acute congestion this fall.

A UNIFORM DATUM FOR RAILWAY ELEVATIONS

ONE of the most important benefits which the railways are securing from the Federal valuation work is the opportunity to complete and bring up to date their maps, profiles and other records. Previous to the inauguration of this work few roads had complete, accurate records of their properties, but the demand of the government for maps and profiles has forced them to prepare the information which they had long desired but had neglected to collect because of the expense. In view of the large mileage of profiles now being run in connection with this work, a publication just issued by the United States Coast and Geodetic Survey on the advantages of the universal adoption of mean sea level as the datum for all levels is of special interest.

In the earlier periods of development of this country it was natural and in fact necessary to assume elevations to start from. It was in this way that the early railways laid their grade lines and built their roads. As other railroads, each with its individual system of elevations, crossed these lines confusion arose and this has been increased as large communities have developed along the railways, each with its individual system of elevations. The result has been an entire lack of uniformity of elevations in the same locality, leading to confusion and needless duplication of work. To provide a universal and at the same time an accurate basis for elevations throughout the United States the Coast and Geodetic Survey is extending a network of precise level lines across the country with permanent bench marks at frequent intervals. These lines of elevations which have mean sea level for their datum plane, aggregated 35,500 miles in December, 1916, of which about 2,500 miles was added last year and 11,500 miles since 1907.

The advantages of a uniform system of elevations for national, city, railway and other work should be evident to all engineers. Many of the railways have already adopted the basis used by the Geodetic Survey and this action should become universal. It is true that the transition from the old to the new datum will necessitate the careful tying in of old records and elevations to the new basis but once this has been done the benefits resulting from uniformity will far outweigh the temporary disadvantages. Because of the wide areas traversed by single railway systems and the large number of communities which they serve the influence of the railways in adopting this datum plane will be important in securing its acceptance in many communities along their lines.

This will simplify much of the work of the railways in these communities where it is frequently of advantage to them to utilize existing records and elevations established in those cities in the planning of new work, etc. Because of the wide scope of their activities it also frequently becomes necessary for railways to compare elevations between widely separated points, frequently removed from their lines. By uniting with the Coast and Geodetic Survey in the establishment of a uniform datum throughout the country the rail-

ways can lend important aid in this work which will be of increasing benefit in the conduct of engineering work of all kinds from year to year.

THE DRAFTSWOMAN

ONE of the most recent manifestations of war influences is the employment of women in railway drafting rooms, the natural result of the general shortage of draftsmen, which has placed a serious handicap on engineering work for some time. Many of the railway valuation offices have been short of men necessary to draw the right of way maps and profiles required by the government and are far behind their schedules, while structural detailers are now commanding 30 to 40 per cent more than the normal scale of wages. Moreover, these conditions promise to become worse when the selective draft is put into effect, since a very large proportion of the draftsmen come within the prescribed age limits. The conditions seem logically to suggest the use of women in drafting rooms. This offers immediate relief, while promising some economies in certain classes of work. To this end the Santa Fe recently gave employment to 12 girls in its Chicago office, another western road has made a start in this direction and at least one eastern road has the matter under immediate consideration.

A considerable part of the work of the drafting room requires no qualifications other than skill in the use of drawing instruments, an accomplishment depending largely upon natural deftness and neatness which are usually more highly developed in women than in men. Tracing, for instance, offers the most immediate opportunity for employment for women, since it is almost entirely a matter of mechanical skill, and many drafting rooms even now are organized to employ certain members exclusively in the tracing of drawings made by others. The plotting of survey notes, earth work cross sections, lease plats, etc., can unquestionably be learned by a bright girl in a short time. In architectural drafting the ability of women has long been established, although only a few are employed. On the other hand, in the field of mechanical or structural detailing, the preparation of track layouts, and other work requiring technical training or at least a fair knowledge of shop practice or field conditions, the immediate usefulness of the draftsman will be limited.

Judging by conditions in other countries women will be employed throughout the course of the war in as large a measure as they show themselves capable of doing the work. There is also every reason to believe that, once they have become established in a given class of work, they will continue to take the place of men even after the close of the war, since economic pressure is continually bringing about the replacement of men by women in many commercial and industrial activities. The mechanical operations required for the making of drawings are not of such a nature that the greater physical strength or mental training of men is of any particular advantage. Consequently the draftsman must expect continued competition from the draftsman, and except in the case of the real designer or engineer-draftsman, he may possibly be driven from the field. Even the technical man will feel the pressure of this competition, since his superiority in education and training will constantly be measured against the greater wage which he must demand as the head of a family. Up to the present time, women have been excluded from drafting rooms principally because engineers have hesitated to make the necessary changes in organization that would permit the employment of both men and women in the same office. Through the agency of the war they are now compelled to make these changes, and with women once employed, economic laws will assert themselves.

WESTERN RAILWAY CLUB DROPS ADVERTISING

THE Western Railway Club has taken an advanced position among railway organizations by abolishing advertising from its proceedings. This source of revenue is one of the most important financial bulwarks of some associations and clubs in the railway field, and has become so well recognized that probably very few men outside of those who pay the bills have stopped to consider whether the advertising is worth anywhere near what it costs the supply companies. Both the railway and supply men in the Chicago club referred to above, who held membership on an equal basis in all respects, did give such consideration to this question, however, and decided that there was ample ground for changing their long existing policy. The supply men were frank in the opinion that, as an advertising medium, the club proceedings were of little value, and further, that as a method of securing donations from the supply industry for the support of the club, this method is very inequitable. The railway men were quick to see the possibility of decreasing the total expenses for publication very materially by the elimination of advertising, and were entirely willing to take this step if the necessary revenue could be secured in other ways. The decision finally reached in regard to this necessary revenue was to divide the membership into two grades—active and contributing—the former for railway men with dues of \$2 a year, and the latter for supply men with an annual rate of \$5.

The elimination of advertising support is undoubtedly an important step in the right direction, for the dangers of abuse in handling it in association publications are too numerous to be entirely avoided in most organizations. The real problem to be faced in considering such a move is how to make up the loss in revenue. The supply men in the Western Railway Club raised no objection to the assessment on them of a higher rate of dues, on the basis that such a club membership is a business proposition for a supply man, and is well worth this cost. While in this case the action taken may be a fairly satisfactory solution of the problem, it falls considerably short of the ideal arrangement.

Any organization of railway men is either of definite value to the men and to the roads they represent, or it is not. If it is, it deserves adequate financial support. If it is not, the quicker it dies from lack of support, the better. Either the railway men who are members of such an organization are able to support it, or they are not. If they are, the solution of their problem is found. If they are not, the railways ought to support the organization collectively. Either an association has a real place in its membership for the technical men employed by supply companies, or it has not. If it has, these men ought to be admitted to some grade of membership. If it has not, such members should not be accepted. The practice of deriving financial support for a railway organization from supply men, either through advertising which does not bring the advertiser value received, or through high rates of membership, is only in effect passing the cost back to the railways indirectly and they can much better afford to bear it directly.

NEW BOOKS

Poor's Manual of Public Utilities, 2,400 pages, 6 in. by 9 in., bound in cloth. Published by Poor's Manual Company, 80 Lafayette street, New York. Price, \$10.

This book contains an alphabetical list of public utility companies in the United States and Canada, with pertinent facts concerning the physical property of each, the territory served, the capital stock, the funded debt, and the directors and officers. In addition, the Manual shows the "marginal safety" over interest and dividend requirements of individual bonds and stock.

Letters to the Editor

"A PATRIOTIC DUTY"

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

In war it is of the utmost importance that the railroads shall be able to handle a vastly increased traffic in an efficient manner.

In most European countries this principle has long been recognized. The governments have provided the roads with facilities, demanded by defense boards, and have enacted laws in regard to private railroads, regulating how the work shall be done, payments and compensations be made, etc.

This has all been prepared in peace times. Now we are in a great war and the Interstate Commerce Commission practically has denied the increases in freight rates asked for by the railroads to meet the extraordinary demands of the war traffic, also the increases in wages, cost of supplies, etc., to strengthen their credit to cope with any emergency and to give their securities the stability to weather storms.

Moreover, our roads have few of the facilities, etc., required for military purposes and which mostly have no commercial value.

One thing is dead sure—the railroads must be provided with increased revenues to meet existing conditions and above all, they need them at once. In war quick decisions are imperative and fussing about trifles is out of place.

The safety and the commerce of our country demand it. Congress has the power to do this and it should perform this patriotic duty without delay.

GUSTAVE E. LEMMERICH.

THE CANADIAN RAILWAY PROBLEM

LONDON, England.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I value highly your opinion, and regret that you do not approve of the solution of the Canadian railway problem recommended in the majority report. I do not think it would be proper for me to argue with you. But without arguing I should like to deal with two points in your article.

You think that our proposed board of trustees "would be a clumsy device for management"; you say that "any commercial concern, to be successfully managed, must have its executive work conducted under the direct supervision not of five men but of one man." I agree, and that is what is proposed. We have recommended that there should be three trustees, the best railway men that can be obtained. Let us call the chairman the president, and the two other whole-time trustees vice-presidents. We have recommended this board should be completed by the addition of two other members not required to give their whole time; and we have assumed that they will leave the normal management of the railway to the president and his two vice-presidents. The only difference between our proposed board of trustees and the ordinary railway board of directors is that we have limited the number of non-experts to two. The reason for this is obvious and I will refrain from stating it.

Further, you express yourself in favor of a scheme "under which the ownership and management of the present private railways would be left in private hands" and "the enterprise and efficiency of private management" retained. I agree, but unfortunately am compelled to add the words "if possible."

I invite you to re-peruse pages 49 and 50 of our report. If we have come to a wrong conclusion in saying that a private company certainly could not be formed in Canada, probably could not be formed outside Canada, while in any

case formation outside Canada would be open to the gravest objection, I invite you to put us right. If you will work out in such detail as to permit of fruitful criticism a private company scheme that in your judgment will meet the situation, you will confer an important service on the people of Canada. For my part, six months' study of the question has taught me that to desiccate or even to adumbrate a scheme is one thing, to work it out in practical detail of dollars and cents is quite another. The former is easy and valueless, the latter, I have been reluctantly constrained to believe, is, under the circumstances, impossible.

W. M. ACWORTH.

THE BARREL CARRIES ITS OWN RUNNING GEAR

OAK HARBOR, Ohio.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I was much interested in the article on page 613 of the March 23 issue of the *Railway Age Gazette*, entitled "Better Freight Containers a Necessity."

This question has been one to which I have given a good deal of thought during my 25 years' connection with my coöperation business.

My deductions from my experience as a manufacturer of packages and as a shipper of various types of packages is that the barrel is the strongest, most portable, most sanitary container; that it has the greatest range of use and that it is the cheapest of all packages, without exception when weight and contents are considered.

Take the transportation question alone. One man will unload a carload of 200 barrels of sugar, weighing an average of 360 lb. each in less than an hour, and not injure a barrel in the slightest way.

On the other hand, no container has ever been produced of a rectangular shape, that could be handled at all with this weight by one or even two men. Even with rectangular containers weighing only 100 lb. each, every one must be lifted bodily and carried or trucked. A barrel can be rolled any distance. In other words it carries its own running gear with it.

The contents of a barrel are protected from damage from leaky car roofs and from rain during loading and unloading or when on platforms, which would be fatal to contents of a fiber container.

Taking the question of a reward for a proper container, or more particularly as to a low rate on its return journey, shipping the barrels empty is not necessary, for the reason that they can be used for any kind of product when empty and always find an eager market, returning full as it were.

The empty barrel itself weighs less than any container ever produced, capacity considered. Metal packages foul in shipping empty, and sometimes rust, while the empty barrel is bright and clean.

The classification on goods shipped in barrels should be lower than on similar goods shipped in rectangular containers for four reasons:

First—There are fewer damage claims.

Second—A freight crew will handle ten times the tonnage in barrels that it will in regular containers.

Third—Cars can be unloaded in one-tenth the time, and under weather conditions that with other containers might prevent the release of the car.

Fourth—The barrel is more sanitary; this is the most important, although it does not enter into the calculation of transportation companies as do the first three.

As a matter of fact, I maintain that in the barrel we have had the best and the cheapest container with us for some time, and that it would be money in everybody's pocket if this were more generally understood.

LACEY Y. WILLIAMS.

Report of University of Illinois Fuel Tests*

Determination of the Relative Value of the Various Grades of Illinois Coal for Use in Locomotive Service

THE tests, the results of which are here set forth, were made by the Railway Engineering department of the University of Illinois in cooperation with the committee on Fuel Tests of the International Railway Fuel Association and the United States Bureau of Mines. Their general purpose was to determine the relative value in locomotive service of various grades of coal.

For this purpose six sizes of coal chosen by the International Railway Fuel Association committee were tested in the locomotive laboratory, on a Mikado type locomotive loaned by the Baltimore & Ohio. These grades were mine

the coal is undercut with electric chain machines. The coal face and the mine itself are quite uniformly dry.

As promptly as possible after its receipt at the laboratory—on the average six days, and in no instance more than 12 days after its arrival—the coal was unloaded into covered bins where it remained protected from the weather until used. The cars were unloaded by hand shovelling about as they would have been at some of the older types of railway coal pockets, and the coal was probably subjected to about the same amount of breakage in this process. The maximum time elapsed between loading the coal at the mine and testing it was 37 days in one instance. Taking the tests as a whole the average time between loading and testing was about 25 days.

Chemical Analyses.—During the progress of each test while the coal was being loaded into the charging wagons to be taken to the firing platform, samples were taken for the purpose of analysis. These samples varied in amount from 500 to 1000 lb., and they were taken according to methods prescribed by the American Society for Testing Materials as set forth in the year book of the society for 1915. The averages of the coal analyses for all tests made with each grade of coal are presented in Table I. An inspection of this table reveals a rather unusual uniformity among the various

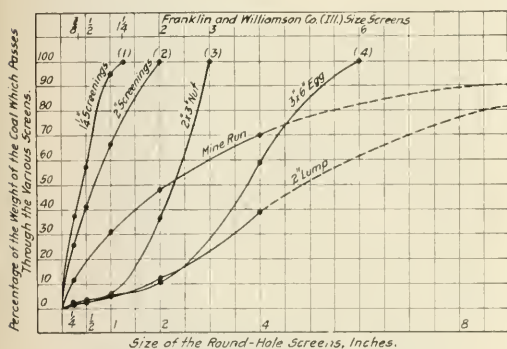


Fig. 1—Make-up of the Coals as Received

run, 2-in. by 3-in. nut, 3-in. by 6-in. egg, 2-in. lump, 2-in. screenings, and 1 1/4-in. screenings, all from United Coal Mining Company's Mine No. 1 at Christopher, Franklin County, Illinois.

The general test program involved for each grade of coal six tests, three of which were made at a medium rate of evaporation, and the remaining three at a high rate. The medium rate was chosen to represent an average rate of working the locomotive, in so far as it is possible to define such an average. During tests run at this medium rate about 23,000 lb. of water were evaporated an hour under the prevailing conditions, from 3,100 to 4,300 lb. of coal were fired per hour, and the engine was worked at 33 per cent cut-off and at about 19 miles an hour, developing approximately 1,300 indicated horse power and about 22,500 lb. drawbar pull. During tests when the engine was worked at the high rate of evaporation, about 43,000 lb. of water were evaporated an hour, the hourly coal consumption varied from about 7,000 to 9,300 lb., the cut-off and speed were respectively 55 per cent and 26 miles per hour, while the horse power was about 2,200, and the drawbar pull about 28,500 lb.

THE COAL USED

The coal used is derived from what is designated by the Illinois Geological Survey as bed No. 6 of the Carboniferous Age, Carbondale formation. The bed averages in thickness about 9 ft. 5 in. and carries almost throughout, at from 18 to 30 in. from the floor, a "blue band" variable in thickness and consisting of "bone," shaly coal, or gray shale. The mine is worked under the room and pillar system and

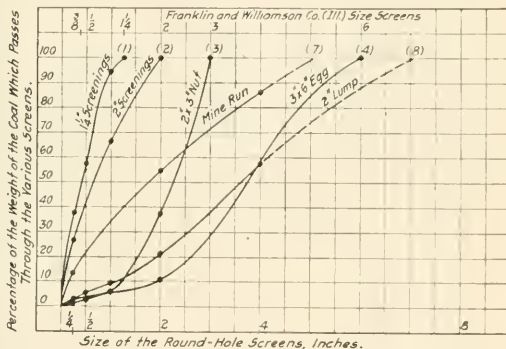


Fig. 2—Make-up of the Coals in the Condition in Which They Were Fired

grades as regards their composition and heating value. The analyses for the two sizes of screenings correspond very closely in all respects and their average heating value, based on dry coal, was only about 2 per cent less than the average heating value of the four larger grades. The uniformity of the analyses and of the heating values make it clear that such differences in performance as developed between the various grades are due chiefly to differences in their mechanical make-up, and only in small measure to differences in their chemical composition.

The Make-up of the Coals.—Due to differences in the nature of the coal, in mining methods, and in methods of preparation, there is frequently much uncertainty about the meaning of such terms as "mine run," "lump," etc. The laboratory has devised a method of screening samples of the coals used during tests for the purpose of separating them into their size elements in order to be able to define and record the actual mechanical make-up of the various grades.

*Abstract of a committee report presented at the 1917 convention of the International Railway Fuel Association.

All the coals used in these tests were thus screened and this process is referred to as the mechanical analysis.

Three carloads each of mine run and lump, and two carloads of each of the other four grades were received at the laboratory. For both the mine run and the lump coals two of the three carloads of each grade were sampled for screening. Samples were taken from each car of nut and each car of egg, whereas the two cars of 2-in. screenings and the two cars of 1½-in. screenings were merged for each grade and one sample only was taken from each size. There were thus taken for mechanical analysis a total of 10 samples, each of which weighed about two tons.

These samples were screened by means of a specially designed shaker screen operated by pulley-driven eccentrics

a considerable proportion of lumps too large for proper firing, the attempt was made to break these two grades down to the extent to which, in the judgment of those in charge of the tests, these grades are generally broken down at the coal chute. These two coals as fired contain, therefore, a smaller proportion of large lumps than when they were received and the extent to which this extra preparation modified the make-up of the coals is defined in Fig. 2.

THE TESTS

The locomotive used during the tests was loaned for the purpose by the Baltimore & Ohio. It is of the Mikado type and was built by the Baldwin Locomotive Works during the summer of 1916. It entered service in September, and upon

TABLE I.—THE CHEMICAL ANALYSIS AND HEATING VALUE OF THE COALS.

Grade of coal	Proximate analysis, coal as fired				Calorific values			Ultimate analysis, coal as fired				Moisture in coal determined from sample taken at mine, per cent
	Moisture, per cent	Volatile matter, per cent	Fixed carbon, per cent	Ash, per cent	Per lb. of coal as fired, B.t.u.	Per lb. of dry coal, B.t.u.	Per lb. of combustible, B.t.u.	Carbon, per cent	Hydrogen, per cent	Nitrogen, per cent	Oxygen, per cent	
Mine run	8.14	34.12	47.92	9.76	11,873	12,926	14,463	66.63	4.28	1.55	8.69	7.82
2-in. by 3-in. nut	8.60	34.83	47.70	8.87	11,957	13,082	14,487	67.50	4.36	1.38	8.42	8.48
3-in. by 6-in. egg	8.82	34.57	48.56	8.06	12,071	13,239	14,523	68.19	4.50	1.51	7.99	....
2-in. lump	9.27	34.46	47.49	9.07	11,817	13,023	14,469	66.34	4.23	1.49	8.73	....
2-in. screenings	9.25	32.05	48.12	10.59	11,550	12,727	14,408	65.74	4.43	1.48	7.66	....
1½-in. screenings	9.09	32.34	48.01	10.57	11,557	12,711	14,385	65.49	4.35	1.43	8.10	9.07

running at a speed of 80 revolutions per minute. Five screens were used perforated respectively with 4-in., 2-in., 1-in., ½-in. and ¼-in. holes. In this way the sample was divided into six parts whose size limits were as designated by the headings of columns 2 to 7 in Table II. These parts were then weighed and the ratios of their weights to that of the original sample were calculated.

Table II presents the average values of these ratios and it defines, therefore, for each grade the magnitude of the size elements which went to make up the original coal and thus records definitely its composition.

The facts embodied in Table II may be re-combined to permit graphical definitions of the grades in another form. Considering the 2-in. by 3-in. nut coal, if we add columns 4 to 7 we find that 36.1 per cent of this coal passes through a 2-in. screen. Adding columns 5, 6, and 7 we find that

its arrival at the laboratory, had run approximately 3,400 miles. It arrived at the laboratory in excellent condition. The principal dimensions of the locomotive are as follows:

Total weight, in working order	284,500 lb.
Weight on drivers	222,000 lb.
Cylinders (simple), diameter and stroke, in.	26 by 32
Diameter of drivers	64 in.
Grate area	69.8 sq. ft.
Heating surface, total (fire side)	3,630 sq. ft.
Heating surface, superheater (fire side)	1,030 sq. ft.
Boiler pressure, lb. per sq. in.	190
Tractive effort	54,587 lb.

The boiler was of the wagon-top type with radial stays. It was equipped with a Schmidt top-header superheater consisting of 34 elements, a Street stoker, and a Security brick arch carried on four tubes. The front end was self-cleaning and was equipped with a plain 6-in. round nozzle-tip without bridge or split, which was used throughout all tests. The total air opening through the grates amounted to 17 sq. ft.

TABLE II.—SIZE ELEMENTS OF THE COALS AS RECEIVED AT THE LABORATORY.

Grade of coal	Per cent over 4-in. screen	Per cent through 4-in., over 2-in. screen	Per cent through 2-in., over 1-in. screen	Per cent through 1-in., over ½-in. screen	Per cent through ½-in., over ¼-in. screen	Per cent through ¼-in. screen	Total
1	2	3	4	5	6	7	8
Mine run	29.6	22.3*	16.8*	11.4	7.4	12.5	100.0
2-in. by 3-in. nut	...	63.9	30.3	2.8	1.1	1.9	100.0
3-in. by 6-in. egg	41.0	48.3	5.3	2.0	1.1	2.3	100.0
2-in. lump	61.6	26.4	7.5	1.9	9	1.7	100.0
2-in. screenings	...	...	33.2	25.7	14.2	26.9	100.0
1½-in. screenings	...	...	4.5	37.9	30.0	37.6	100.0

* Derived from plotted curves (Fig. 1).

5.8 per cent. will pass through a 1-in. screen, etc. Obviously also 100 per cent of this grade passed a 3-in. screen in the original preparation at the mine. The six curves drawn in Fig. 1 are plotted from the percentage values thus obtained for each of these grades. Those portions of the curves drawn with broken lines are not supported by direct experimental data. The scale shown in the upper part of the diagram represents the screen sizes which are commonly used in the mines of southern Illinois.

All grades except the mine run and lump were unloaded into the charging wagons from the bins without further preparation and they were consequently fired in exactly the condition in which they arrived at the laboratory, except for the breakage incident to unloading and the insignificant breakage due to shoveling into the charging wagons. Since, however, the mine run and the lump coals contained as usual

or 24.4 per cent of the grate area. The area of the air inlet to the ash pan amounted to 8.3 sq. ft. or 49 per cent of the air opening through the grates. The locomotive was regularly equipped with a hand-operated door which was replaced during the period of the tests by a Franklin pneumatic door of the butterfly type. This was used during all tests except those with the two sizes of screenings, which were fired by means of the Street stoker.

Throughout each medium rate test, the time of firing the last scoopful of each ton was recorded, together with the levels of the water in the main feed tank and in the boiler glass. During the high rate tests, these facts were recorded at the time of firing the last scoopful of each two tons of coal. This procedure made it possible to control the regularity of the firing process and it also makes available facts which may be used to illustrate the regularity of

feed of both the coal and the water. For this purpose tests 2,405 and 2,416, fairly characteristic of the series, have been chosen. During test 2416, run at a medium rate of evaporation, the time required to fire each of the 10 successive lots of 2,000 lb. varied only from 34 to 36 minutes; and the amount of water fed per minute during these 10 intervals varied only from 390 to 413 lb. During test 2,405 which was run at a high rate of evaporation, the times required to burn each of the five successive lots of 4,000 lb. of coal were respectively 36, 33, 31, 32 and 31 min.; and the water fed per minute during these intervals varied only from 693 lb. to 709 lb.

An inspection of the values of equivalent evaporation per

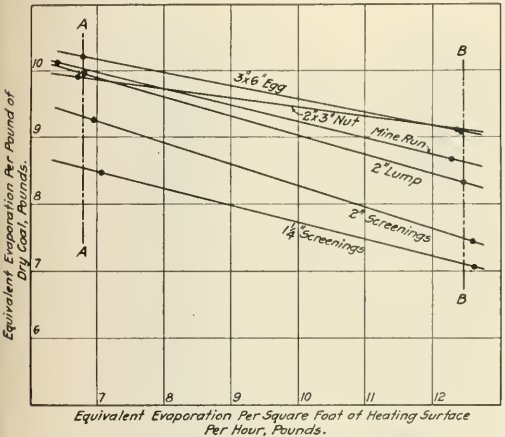


Fig. 3—Relation Between Equivalent Evaporation per Pound of Dry Coal and the Rate of Evaporation

pond of dry coal as obtained from each test disclosed great uniformity among the values applying to each grade of coal and each rate of combustion. Only in the case of the high rate tests with the 2-in. lump coal is there any considerable variation between the equivalent evaporation values for the individual tests and even in this group the maximum variation from the average is only 5½ per cent. In view of this uniformity we are entirely warranted in using the average values for the various groups and in basing conclusions upon them. These averages of equivalent evaporation per pound of dry coal are therefore assembled in Table III together with the averages of the rate of evaporation per square foot of heating surface per hour.

Grade of coal	2 For the medium rate tests		4 For the high rate tests	
	Equivalent evaporation per lb. of dry coal, lb.	Equivalent evaporation per hour per sq. ft. of heating surface, lb.	Equivalent evaporation per lb. of dry coal, lb.	Equivalent evaporation per hour per sq. ft. of heating surface, lb.
3-in. by 6-in. egg.	10.21	6.78	9.09	12.42
Mine run	10.12	6.40	8.66	12.28
2-in. lump	9.95	6.82	8.32	12.46
2-in. by 3-in. nut.	9.90	6.72	9.11	12.39
2-in. screenings.	9.25	6.95	7.43	12.59
1½-in. screenings.	8.47	7.07	7.06	12.61

In Table III the coals are arranged in the order of the evaporation at the medium rate as given there in column 2. For the high rate tests the nut coal gave the best performance, while the other grades stand in the order in which they are cited in the table. These relations stand out more clearly in Fig. 3 which has been prepared by plotting the values of equivalent evaporation and rate of evaporation given

in the table. In the figure the two points for each coal are connected by a straight line, which implies the assumption that the equivalent evaporation varies regularly and directly with the rate of evaporation. While there are, in this series, no tests at intermediate rates to support this assumption, it is amply warranted by the results of numerous other locomotive boiler tests.

Inspection of Fig. 3 reveals, as usual, for all grades a sharp decrease in evaporation as the rate of evaporation increases. The rate of this decrease is nearly alike for all grades except the 2-in. by 3-in. nut, for which it is roughly one-half of that for the other grades. This change in evaporation with rate of evaporation makes it necessary to reduce the values of evaporation to a common rate before drawing final comparisons between the various grades. To effect this reduction the rates of evaporation for the medium rate tests have been averaged and this average 6.70 lb. per sq. ft. of heating surface per hour—has been represented by the vertical line A-A in Fig. 3. Similarly the average high rate—12.46 lb. per sq. ft. of heating surface per hour—is defined by the line B-B. If we measure off the vertical distances on A-A at the points where this line is intersected by the performance lines for the various grades we obtain six

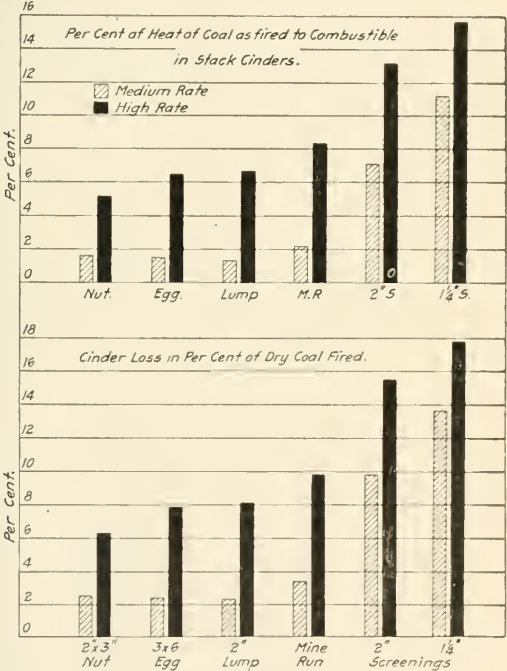


Fig. 4—The Cinder Losses

values of equivalent evaporation per pound of dry coal, one for each grade, which are rigidly comparable; in like manner the evaporation values defined by the intersections with the line B-B are comparable.

At the medium rate the four larger grades gave nearly the same performance, the maximum difference among them being but four per cent. The steam production per pound of egg coal was two per cent greater than with the mine run, while with the lump and the nut it was respectively one per cent and two per cent less than with mine run. The performance with 2-in. screenings was seven per cent less

and with 1½-in. screenings 15 per cent less than with mine run. If we assume that mine run coal on the tender is worth \$2 per ton the relative worth on the tender of the other grades during the medium rate tests was:

3-in. by 6-in. egg	\$2.04
2-in. lump	1.93
2-in. by 3-in. nut	1.96
2-in. screenings	1.86
1½-in. screenings	1.70

At the high rate the 2-in. by 3-in. nut coal gave the best performance, producing six per cent more steam than the mine run; the 3-in. by 6-in. egg comes next with an evaporation 5 per cent more than that of the mine run; while the 2-in. lump evaporated three per cent less. At this rate of evaporation the 2-in. screenings and the 1½-in. screenings produced per lb. respectively 13 per cent and 18 per cent less steam than the mine run. If we again assume that mine run is worth on the tender \$2 per ton, the relative worth of the other grades during the high rate tests was as follows:

2-in. by 3-in. nut	\$2.12
3-in. by 6-in. egg	2.10
2-in. lump	1.94
2-in. screenings	1.74
1½-in. screenings	1.64

In considering the cinder losses as here presented it should be borne in mind that all of the coal tested was of one kind, that is, it came from one mine. Coals possessing other physical characteristics might show somewhat different results as to cinder losses under the conditions of the tests here considered. It should also be remembered that for a given rate, medium or high, the draft was, for all grades of coal, practically constant.

Fig. 4 shows the amount of the stack losses when the

dry coal. The average heating value of the stack cinders for all medium rate tests was 8,635 B. t. u. and the average value for all high rate tests was 10,854 B. t. u. The heating values of the cinders from the medium rate tests with screenings were higher than corresponding values from other grades of coal.

In Fig. 4 it will be seen that, during the medium rate tests, from two to 14.6 lb. of cinders were collected from the stack for each 100 lb. of dry coal fired; while for the high rate tests from 6.2 to 17.8 lb. were collected for each 100 lb. of coal. The screened coals in all cases produced fewer cinders than the mine run coal; and the screenings produced a materially greater quantity of cinders than any of the larger grades.

When the losses are expressed as B. t. u. percentages, the

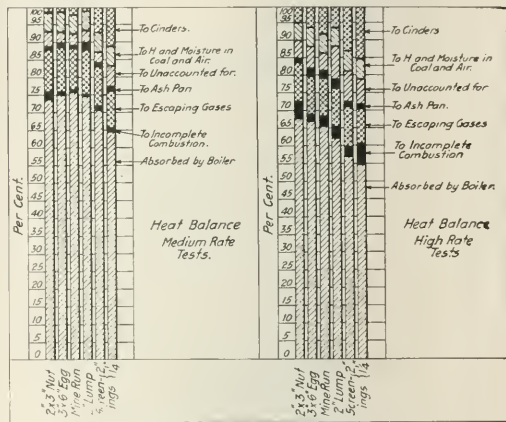


Fig. 6—The Distribution of Heat During the Medium and High Rate Tests

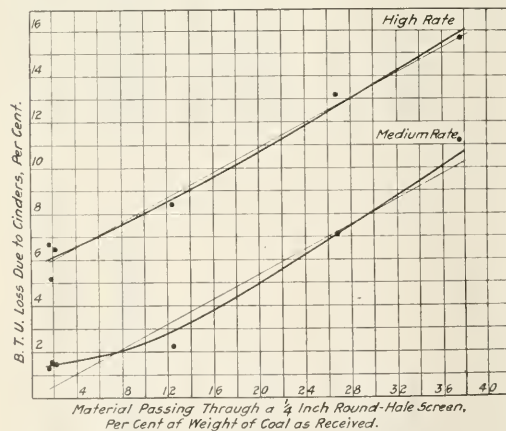


Fig. 5—Relation Between Cinder Loss and Fine Material in the Coal

weight of the cinders collected from the stack is expressed as a percentage of the weight of the dry coal fired, and also the amount of such loss when the heat content of the cinders collected from the stack is expressed as a percentage of the British thermal units in the coal fired. The loss when expressed as per cent of B. t. u. is numerically less than when expressed as per cent of weight of dry coal due to the fact that the cinders do not have as high a heat value per pound as the coal from which they originate. Also, due to the fact that cinders produced at high rates of combustion have higher heating values than cinders produced at low rates of combustion, the differences between percentages for medium rate and high rate tests are greater when expressed in terms of heat units than when expressed in terms of

average loss from the screenings was roughly five times as great as the average loss from the larger coals during the medium rate tests. For the high rate tests the average loss from the screenings was more than twice as great as the average loss from the larger coals.

The data indicates that with very fine coals such as screenings the cinder loss is large even at medium rates of combustion and with comparatively low front-end draft; but that under these conditions the cinder loss is not serious for the larger coals even when they contain a considerable amount of fine material, as in mine run coal. For conditions involving high rates of combustion and strong drafts, however, the stack cinder loss is a serious one for all grades of coal.

Fig. 5 shows the relation existing between the loss due to stack cinders and the amount of ¼-in. or smaller material in the coal as received. The curves in addition to showing the relative magnitude of the cinder losses for the two rates of operation, show that the cinder losses increased quite uniformly with the increase of fine material in the coal. At the medium rate about one per cent of the coal would apparently be lost as cinders if there were no ¼-in. fine material at all in the coal; while at the higher rate and without such material, the loss would be about 5.5 per cent. The curve for the high rate tests shows an increase in the cinder loss of very nearly one per cent for each increase of 3.7 per cent in the amount of ¼-in. material in the coal. The light straight lines show for both rates, a uniform increase of one per cent in cinder loss for each 3.7 per cent increase in the ¼-in. material in the coal. The straight line

represents the plotted points of the high rate tests closely but does not so well represent the points plotted for the medium rate tests.

Fig. 6 presents average heat balances for the tests with each grade of coal for both medium and high rate tests. The figures have been so constructed that the groups are arranged with relation to decreasing values of the per cent of heat absorbed by the boiler during the high rate tests.

Generally speaking, the relations between the various elements of the heat balance for the different grades are nearly the same for the medium rate tests as for the high rate tests. All losses except those due to stack cinders are fairly constant for all grades of coal and the differences in the amount of heat absorbed by the boiler are accounted for, almost entirely by the variations in the losses due to stack cinders.

CONCLUSIONS

It was necessary to use one size exhaust nozzle during all tests, but probably different results on the nut coal at low rate would have been obtained with a larger nozzle. These and other tests we should like to have made had we had the funds and the authorization of the association.

Comparing mine run with 3-in. by 6-in. egg, we find the egg was 2 per cent better at the low rate and 5 per cent better at the high rate. The B. t. u. value of the egg was 2 per cent more than that of the mine run. This accounts for the difference at low rate and brings the high rate difference to 3 per cent; but when it is considered that the stack cinders were 2.2 per cent of the egg fired at low rate and 3.1 per cent of the mine run fired at low rate and 7.2 per cent of the egg fired at high rate and 9.0 per cent of the mine run fired at high rate, it is evident that the increased cinder loss of mine run coal over 3-in. by 6-in. egg is in part offset by the better combustion of the smaller particles of coal which exist in greater percentage in the mine run.

The higher standing of 2-in. by 3-in. nut than mine run at high rate is due to the lesser cinder loss and to the even and uniform condition in which it is possible to keep a fire using 2-in. by 3-in. nut. At the medium rate we believe the lower standing of the 2-in. by 3-in. nut in comparison with mine run was due to the necessity of carrying too thin a fire with the nut. At the low rate the 2-in. lump is one per cent below the mine run and three per cent at the high rate. At the low rate the 2-in. lump is 1 per cent below the mine run and 3 per cent below at the high rate. When firing 2-in. lump it was reduced to such size that about 74 per cent would pass through a 5-in. round opening, whereas all of the mine run as fired would pass through that size opening. The 2-in. lump was cracked to about the same size as it would be at a coal chute where the coal is cracked and passes through breaker bars spaced 5-in. in the clear. There were consequently not the large pieces in the mine run that there were in the lump and the committee concludes that cracking coal to the point where it will pass through a 5-in. round or 6-in. round opening is worth more than it costs. We do not necessarily mean hand cracking, for under many conditions mechanical crushing of the larger size coals will be found very profitable. Many roads prepare elaborate statements showing the cost of operating coaling stations and often as a result of these statements coal is not properly cracked. A coal needing much cracking, when sent to a chute having breaker bars causes the cost of chute operation to go up. The fuel distributor is then told to send this coal to a chute where there are no breaker bars and thus it is only slightly cracked.

Under ordinary circumstances mine run coal from this district can be purchased at from 15 cents to 25 cents less per ton than 2-in. lump, and 2-in. by 6-in. egg or 3-in. by 6-in. egg, and the egg and lump are often considered more economical and satisfactory than Mine Run. Where this

price differential exists, it would pay to increase supervision to the point where mine run can be handled as satisfactorily by all firemen as the lump and egg.

At the low rate the 2-in. screenings were 9.2 per cent better than the 1 $\frac{1}{4}$ -in. screenings, and at the high rate 5.2 per cent better than the 1 $\frac{1}{4}$ -in. screenings. At medium rate the cinder losses are not serious for the four hand-fired grades, but at high rate they are greater than is desirable. At both medium and high rates with the stoker fired grades these losses are very high though not enough to wipe out the ordinary price differential existing between the hand fired and stoker fired grades. This shows the importance of using on stoker engines as large screenings as the price differential will permit. Railway mechanical engineers, locomotive designers and builders, should give this matter serious consideration.

One of the problems which is beginning to confront railroads using stokers is what fuel efficiency will be obtained when using mine run hand fired in comparison with screening this mine run into 2-in. lump for hand fired engines and 2-in. screenings for stoker fired engines. Assuming that the mine run splits into 52 per cent of lump and 48 per cent of screenings, we find that using mine run as 100 per cent the lump and screenings give 96 per cent of the efficiency of mine run at the low rate and 92 per cent at the high rate. This of course applies to both lump and mine run as cracked on these tests.

As a general conclusion addressed to engineers of tests and mechanical engineers we wish to recommend that all tests and data covering locomotive tests and boiler design be accompanied by a complete description of the character and size of the coal, also that when tests are being made care be taken to make sure that the coal fired is an average grade. In using mine run too much care cannot be taken to be sure that the normal percentage of all sizes of coal going to make up the mine run are contained in the coal tested.

The differences between mine run, 2-in. lump, 3-in. by 6-in. egg, and 2-in. by 3-in. nut are such that they could not have been determined by the ordinary road tests where only two or three round trips using each grade of coal would have been made, and the committee wishes to call attention to the fact that a very large number of road tests must be made to get a reliable average.

RECOMMENDATIONS

The Committee recommends:

That this report be placed in the hands of railway fuel men, engineers of tests, locomotive designers, and others who will be able to apply the data herein contained toward reducing operating costs on their lines.

That railways pay more attention to coal preparation and supervision of engineers and firemen with a view to securing better combustion.

That the tests on Franklin County, Illinois, coal be continued to cover: First; (a) 6-in. lump coal cracked to various sizes, (b) mine run coal cracked to various sizes, (c) 2-in. lump coal cracked to various sizes, (d) 6-in. egg run or screenings; Second; Tests at lower speed and higher drawbar pull.

That tests similar to those covered by this report and recommended above be made on coals from other districts, especially on coals having higher ash, higher and lower moisture and coking coals.

The report was signed by J. G. Crawford, chairman, H. B. Brown, W. P. Hawkins, O. P. Hood, L. R. Pyle, W. L. Robinson and E. C. Schmidt.

DISCUSSION

The influence of the mechanical make-up of coal on its evaporative value has not been known heretofore. Tests of this sort should result in economies by bringing about the use of the most economical grades of coal and the proper

sizing of coal for best results. Railroads are sometimes forced to use coal with a rather high percentage of slack on locomotives, and these tests show the probable loss under such conditions. While poor results are obtained from coal high in slack, it was reported that nut coal in some cases had been found unsatisfactory, owing to difficulty experienced in cleaning fires. It was urged that the tests at the locomotive laboratories be continued, testing coals of higher ash contents and coking coal.

WASHINGTON CORRESPONDENCE

WASHINGTON, D. C., July 10, 1917.

PROPOSED WAR TAX ON RAILWAYS

Any railway officer who has not taken the pains to study the complicated provisions of the proposed war tax bill because of any notion that most railways have been immune from any approach to "excess profits" is due for a surprise when he comes to analyze the bill. The word "excess" is by no means synonymous with "excessive," the word "profits" requires some definition, and, in fact, most of the important terms used in the bill, such as capital, income and surplus, have very little relation to the commonly accepted significance of these terms, but are given arbitrary, artificial definitions which vary widely from the standard meanings.

While it is impossible to give any definite idea of what the proposed taxes will amount to, without a calculation for each road separately, figures that have been worked out tentatively for a number of roads indicate that if the bill should become a law some of the eastern roads that will receive increased revenue from the commission's decision in the 15 per cent case will have little of it left, after paying their taxes, to meet the other increased expenses which impelled the commission to allow an advance, while some other roads probably will have to pay much more in war taxes than the rate decision will give them.

The railways are affected by the income tax of 4 per cent, the excess profits tax and the 15 per cent tax on surplus, according to the provisions of the war revenue bill reported to the Senate last week. It was re-referred to the finance committee on Saturday for redrafting in order to raise enough additional revenue to enable the government to buy all the whiskey in the country at cost plus 10 per cent. The principal provisions of the war revenue bill as applied to railroads were briefly noted in last week's issue. A reading of the bill, however, gives little idea of its effect without actual figures, because of the peculiar meaning of the terms employed.

The new excess profits tax as proposed by the Senate Finance Committee applies to net income in excess of the average for the pre-war period of 1911, 1912 and 1913, or in excess of 6 per cent if the pre-war income was less than that amount. Net income as used in the bill means practically the net corporate income less dividend income. The capital on which the 6 per cent exemption is figured is defined as the fair average value of the assets actually invested, less the average amount of the liabilities and is practically the capital stock plus surplus. The proportion between excess profits and net income is to be determined by the Commissioner of Internal Revenue in accordance with regulations prescribed by him, with the approval of the Secretary of the Treasury.

If the average capital is greater or less than that during the pre-war period, allowance is made by deducting from the net income a proportionate amount. The rate of tax imposed on the excess is not a straight percentage of the excess but a graduated percentage, from 12 to 50 per cent, of the amount of the excess above the pre-war income or the 6 per cent exemption. The rates are 12 per cent on excess profits up to 15 per cent of the exemption, 16 per cent on the excess between 15 and 25 per cent, 25 per cent on excess between 25 and 50 per cent, and so on up to 50 per cent on any excess above 250 per cent.

The excess profits tax is in addition to the war income tax, which is increased from 2 to 4 per cent on the net income, which in this case means net corporate income less dividend income. There is also added a new tax of 15 per cent on the amount, remaining undistributed 60 days after the end of the year, of the total net income received during the year, less the amount used with the approval of the Interstate Commerce Commission or state or local authorities for extensions, renewals or betterments, and less the amount of other war taxes.

* * *

The Senate on July 7 disagreed to the House amendments to the priority bill, which has been passed by both Houses of Congress, and Senators Newlands, Smith of South Carolina, and Cummins were appointed members of a conference committee on behalf of the Senate. The bill to increase the membership of and reorganize the Interstate Commerce Commission which has been passed by both the Senate and the House, is still in conference, where an effort will be made to reconcile the differences in the bills as passed by the two Houses.

* * *

The appointment of Frank McManamy, chief inspector of locomotive boilers of the Interstate Commerce Commission, as a member of the commission has been recommended to President Wilson by Senators Hollis, Walsh, Husting and Ashurst.

JURY BLAMES AUTO DRIVER FOR ACCIDENT

After a full investigation of a grade crossing accident which occurred on the Chicago, Rock Island & Pacific at Midlothian, Ill., on May 13, a Cook county coroner's jury recently rendered a verdict which holds the driver of the automobile wrecked in the accident to have been criminally careless to the degree of manslaughter. The jury also recommended that he be held to the grand jury on this charge until released by due process of law. This is one of the comparatively infrequent cases where a railroad is involved in which the blame for an accident has been placed solely upon the other party. The accident occurred about 4:45 p. m. on May 13, at Midlothian, Ill., a station about 25 miles southwest of Chicago, when a Rock Island passenger train, running between 50 and 60 miles an hour, eastbound, struck a Studebaker 7-passenger automobile owned and driven by Guy A. Ferree. Ferree was a real estate salesman, and had in his car six people, five of whom he was taking to some property near Midlothian. These six people were killed almost instantly, while Ferree, the driver of the car, survived, and is now convalescent. The grade crossing was in good condition. Two main tracks and a side track cross the street, and the Midlothian station of the Rock Island is located close by. Two other sidings are located between 80 and 100 ft. west of the main line tracks. The view from the road in the direction from which the train approached is clear and unobstructed, and a train would be in full view when within one-half or three-quarters of a mile from the crossing at any time when an automobile might be within several hundred feet of the tracks.

An inquest was held by a deputy coroner of Cook county at Blue Island, Ill., on June 23 and June 29. After the testimony was taken the jury went to the scene of the accident and viewed the crossing and surroundings. After deliberation the coroner's jury returned the verdict mentioned above. The driver of the machine testified that he did not stop, that he did look, but did not see anything. Outside witnesses testified that they heard the whistle of the train even before they could see the train itself. Had Ferree stopped his machine and looked, at any point within 80 or 100 ft. of where the automobile was struck, the accident might have been avoided.

Heavier Car Loading Is Winning Out

Methods Used by the Pennsylvania Railroad Which Are Proving Successful. Canadian Pacific's Good Work

THE *Railway Age Gazette* will print from time to time accounts of methods which are being pursued to obtain better car loading together with a summary of some of the results being obtained. The following articles describe methods used on roads that are meeting with encouraging results.

MAKE ONE CAR DO THE WORK OF TWO

By H. C. Bixler,

Superintendent Stations and Transfers, Pennsylvania Railroad

"Make one car do the work of two" is the slogan that the Pennsylvania is trying to drive home to every shipper and consignee, every broker and buyer, every farmer's grange,



Car with Only Half a Load of Crates of Onions

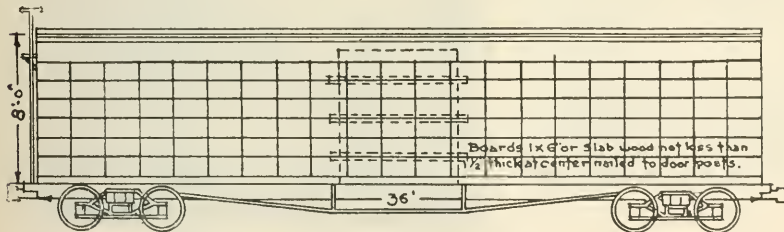
manufacturer's association, board of trade and chamber of commerce on its lines. It is the big gun in the battery and represents, we believe, the solution of the car shortage prob-

lems upon the full capacity of the car which is 10 per cent above the marked capacity; by loading cars as soon as they are placed and not taking advantage of the 48 hours' free time allowed under the car demurrage rules; by giving the agent billing instructions in advance so that the car can be moved as soon as it is loaded.

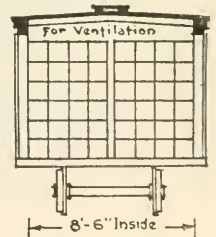
Consignees can help; By increasing the size of their orders for goods to the carrying or cubic capacity of cars instead of ordering goods on the minimum carload basis, which in many instances is only half a carload; by arranging in advance for men and teams to unload cars as soon as placed and not take advantage of the 48 hours' free time allowed under the car demurrage rules; by avoiding use of cars for storage purposes; by instructing their teamsters to finish the unloading of a car at the end of the day when only a small portion of the load remains in the car.

On the Pennsylvania Railroad system the average loaded freight car moves with about half its carrying capacity utilized. What this means may be judged from the fact that on the Pennsylvania alone the unutilized car space is equivalent to the carrying capacity of 120,000 freight cars.

It is realized, of course, that it is not possible now, and probably never will be, to have every freight car move at all times with a full load. That would represent an ideal condition. Nevertheless, we should endeavor, as far as possible, to make 100 per cent capacity our goal in an effort to make every freight car do all the work possible. On the Pennsylvania we have been actively engaged in this campaign for little over a year. We found many difficulties to overcome, both in regard to commercial practices and railroad operation, but feel that we can point to actual and substantial results. Taking our lines east of Pittsburgh and Erie for comparison and using the latest figures available, namely, those for April, 1917, we find that the average load per freight car has been increased nearly three tons as compared with the corresponding month of the year previous. This means a saving of more than 58,000 cars in a month. Measured in value per car to the railroad this



Car Loaded with 1,000 Crates of Onions. Weight, 54,000 lb.



lem. We are doing this as a portion of our share of the work which has been undertaken by all the railroads of the country to raise their operations to the highest practical degree of efficiency, in order that they may in that way render the maximum service to the government in the conduct of the war.

There are a number of ways in which it is conceivable that more work can be gotten out of a freight car.

Shippers can help: By ordering only such cars as are needed for immediate loading; by basing their orders for

would mean a large saving, but measured in car value to shipper and to the country as a whole, a far larger saving has been achieved.

We feel that we have "broken the ice," so to speak, in this work, and our headway this year should be at a more rapid rate, which will be of correspondingly increased benefit to the government, to the shipping public and to the railroad.

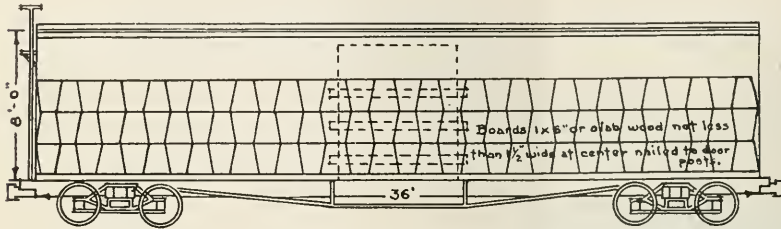
It is impossible to make any material progress in the way of increased car efficiency without the full and complete co-

operation of the shipper and consignee, but we cannot expect to have this unless they fully understand the practicability of what we are trying to do.

We have carried on the work chiefly through station agents, furnishing them with material in the series of car utility bulletins, of which six have thus far been issued. The first four bulletins paved the way for our bulletin No. 5 which was prepared in diagram form and with the thought of bringing directly to the attention of the shipper, the extreme waste of car space which results when the trade unit

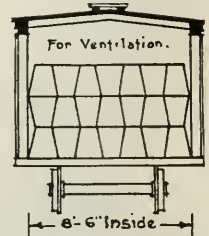
carrying capacity. Our car utility bulletins have dealt very largely with this subject by pointing out specific instances. Cotton is shipped in 50 bale lots, weighing 25,000 lb., although a car will hold 108 bales, weighing 54,000 lb. In the building trade it is customary to order bricks in 10,000 lots, which is less than half a carload; tomatoes are commonly shipped in units of 550 cases, which weigh about 37,000 lb., while a car will carry 1,500 cases.

The usual shipment of fertilizer, 250 bags, weigh 42,000 lb. The car could be loaded with 600 bags, weighing 100,-



Hampers Loaded to Brace Each Other

672 Hampers of Cucumbers (Size 20 in. by 16 in. by 10 in.) Approximate Weight 27,000 lb.



is the governing factor. In this bulletin we could show through these diagrams plainer than in any words that could be written, the space occupied in car by certain commodities when shipped in trade or selling units. Alongside of the present method of loading we were able to show a plan of a car holding twice, and in some cases, almost three times as much freight as was formerly the practice to load. Bulletin No. 6 closely followed No. 5 and covered the loading of fruits and vegetables. We were able to show in this bulletin by means of diagrams and photographs that increased carloading not only helped to eliminate car shortage but permitted of better stowing and subsequent better condition of

000 lb. A full carload of sugar, in bags, would contain 1,000 bags, weighing 102,000 lb., whereas a car usually consists of only 400 bags, weighing 40,800 lb. Sugar in barrels is ordinarily shipped 100 barrels to the car, while 244 barrels could be placed in the car, and the weight increased from 37,280 to 90,960 lb. In a similar way, the commercial unit in shipping salt is 536 bags, weighing 53,600 lb. A box car will hold 1,100 bags of salt, weighing 110,000 lb. Oil is usually shipped 65 barrels to a car, the weight being



Not Enough Hampers Put Into the Car to Properly Brace Each Other

perishable freight upon arrival at the market. These diagrams brought out in pictures what we had been trying for months to portray in words: the unreasonable waste of car space. Some of the photographs and diagrams are here printed. After the agents understand what we are endeavoring to accomplish, it is not a very difficult matter for them to pass the information on to patrons with whom they come in contact.

One of the greatest problems which confronts us today lies in the trade customs in the various lines under which commodities are shipped in commercial units of so many sacks, bags, and barrels, which, instead of filling or approximately filling the car, take up only about half of the cubical or



Damage Resulting from Only Partly Loading a Car

20,650 lb. There is no reason why 148 barrels of oil, weighing 60,680 lb., could not be shipped in a car.

One of the most encouraging developments we have noticed is the disposition on the part of a number of shippers, some of them very large ones, to get into the campaign themselves, and to individually urge better car loading as a means of increasing their own business.

The Universal Portland Cement Company of Pittsburgh, Pa., and the Alpha Portland Cement Company of Easton, Pa., are showing very remarkable results in increased car loading of cement. The Carnegie Steel Company, the American Sheet & Tin Plate Company, and the National

Tube Company of Pittsburgh, Pa., have inaugurated a systematic method for intense loading, and they have succeeded in utilizing almost the entire car capacity.

The Washburn-Crosby flour mills are conducting a lively campaign for better loading by issuing educational circulars. The Barrett Manufacturing Company at Philadelphia has increased its average loading per car three tons since the first of the year, and has set up as a standard 23 tons to be obtained by September 1.

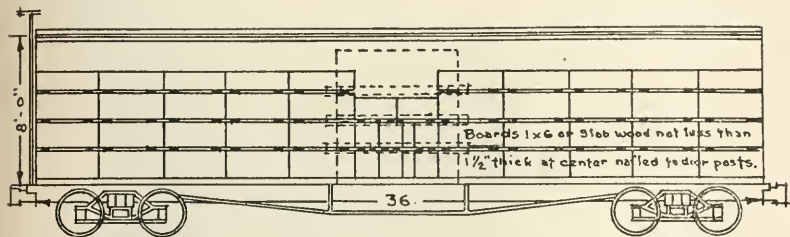
We are especially glad to notice that the fertilizer trade is taking up similar work and carrying it on in earnest, with the aid of the American Fertilizer Magazine. Willet & Gray's Statistical Trade Journal has given its support to

patriotic impulses have been stirred, and a general appreciation aroused as to the urgent need for making the greatest possible use of freight car facilities.

CANADIAN PACIFIC METHODS

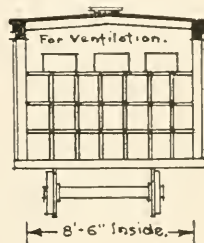
The operating department of the Canadian Pacific has given the problem of increasing the average load per car constant attention for a number of years. During this time various methods have been developed in bringing about the desired improvement in the freight handling performance of the equipment which are of general interest to railway men.

While on certain portions of the line large quantities of



Car Loaded with 256 Crates of Cabbages, Weighing 51,200 lb.

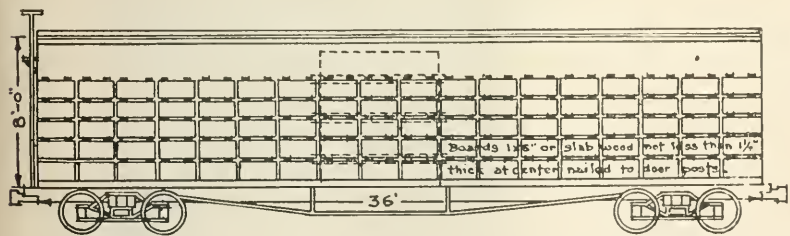
Strips are Nailed to Ends to Give Ventilation



the Pennsylvania Railroad's campaign for heavier loading by reprinting diagrams covering the loading of sugar. The Canner Magazine of Chicago has also taken up the cudgels in the interests of freight car efficiency. Special mention is due to the Railway Business Association for its vigorous campaign covering the entire country. It was a great patriotic act when President George A. Post volunteered to put the powerful machinery of the Railway Business Association behind the full loading of cars.

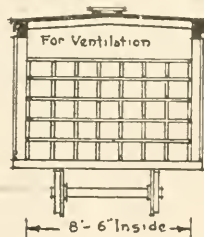
Lately we have been trying the effect of competition as a means of stimulating better car loading. This has been done in several ways, one being by tabulating each month of

heavy commodities, such as grain, coal and ore are transported, there is also a great volume of manufactured articles, forest products and similar freight cars which cannot be loaded to anything like the weight handling capacity of the cars. It was found on investigation that with shipments of a heavy nature it was customary for shippers and consignees to handle their goods in lots of certain designated sizes without regard to the capacity of the car. Many flour millers, for instance, when calling for wheat ordered a "carload" of 1000 bushels, equal to about 60,000 lb.; purchasers of cement, flour, sugar and similar goods likewise placed orders based on the minimum weights prescribed by tariff or so ordered



Carefully Loaded Car with 630 Crates of Tomatoes

Strips of Not Less Than 1 in. in Thickness Nailed to Both Ends of the Crates Extending from Side to Side are Required to Give Proper Ventilation



the result obtained by every division, thus reflecting the energy with which the station agents and various sections of the railroad are conducting their work. In a similar way we have called to the attention of shippers the relative conditions as to car loading, and we have noticed a gratifying desire on the part of many of our patrons to be leaders in this work of aiding transportation efficiency. This is made possible through a system of reports, whereby each agent is required to furnish the general office with all the data concerning the loading from his station.

Such rivalry, both within and without the railroad organization, cannot fail to have important results, as it shows that

sometimes for no other reason than that they had always secured their freight in that manner. The resulting light loading and waste of equipment has had no small part in the creation of car shortages during seasons of heavy traffic, and also, has, to a certain extent, been responsible for the congestion at such times by forcing into delivery points a greater number of cars than were absolutely needed to move the traffic offering for the various destinations, besides causing the expenditure of engine and man power in moving a large percentage of tare weight that should have been devoted to the handling of actual freight.

The situation naturally received more attention than ever

when, a few months after the beginning of the war, the railway was called upon to move immense quantities of munitions to the seaboard for transportation overseas, to carry thousands of carloads of raw materials to munitions plants and, at the same time, to transport the regular business of the country. Facilities were taxed to the utmost and the time soon arrived when the thousands of cars which had been idle during the season of depression immediately preceding, were all in service, and the demands of the shippers were far from being met. It was impossible to secure more cars, and, in fact, the company had, and still has considerably less than its rightful quota of equipment, owing to congestions existing on other lines, which condition has resulted in serious delay in returning cars to the owners. The obvious method to adopt in relieving the shortage was to load more freight in the same number of cars, and it was plain that there was unlimited room for improvement in that direction. The first step was to ensure capacity loading of all company material, and it was seen to that the existing instructions on this point were strictly observed.

Tests had been made some time previous in connection with the carrying capacity of cars, and it was found that while a 30-ton car might not, with safety, be loaded to more than 33 tons, cars of 40 and 50 tons capacity might be given considerably in excess of the usual 10 per cent over stencilled capacity. It was arranged that 40-ton box cars were to be loaded to 94,000 lb. and certain series of 50-ton open cars to as high as 125,000 lb. Connecting roads were then approached with the suggestion that they permit similar loading of their equipment, or, if they were unwilling to do this, to allow Canadian Pacific cars to be so loaded for passage over their respective lines that benefit might be obtained from the increased load per car in the movement of through as well as local traffic. Various replies were received, but a number of the railways addressed signified their approval of the proposition, and have adopted the practice.

The Canadian Pacific handles an immense volume of grain from terminal elevators in Western Canada, both for export via Atlantic seaports and to flour mills in the east. The effect of the increased capacity of 40-ton box cars in supplying equipment for the movement of this grain has been most marked, and a striking example of this is found in the following:

Between May 1 and December 31, 1916, there were loaded in 40-ton cars from the Canadian Pacific elevator at Port McNicoll 17,769,391 bu. of wheat for export via Montreal, Que., and via St. John, N. B. Up to about the middle of November this wheat was taken to Montreal, a distance of 358.8 miles, and from then until the close of the year to West St. John, a distance of 836.6 miles. The wheat was loaded in 11,366 cars, so that the average load carried was 93,803 lb. or 1,563 bu. The increase in the average load per car beyond 10 per cent in excess of the stencilled capacity authorized by M. C. B. rules, of 5,803 lb. resulted in a saving of 750 cars, and the haulage of dead tare to the extent of approximately 11,932,502 ton miles. It might be added that in the movement of the above large number of cars, and, in fact, in no case on record, did an accident occur that might be attributed to the loading of the equipment in excess of the usual 10 per cent over marked capacity. During the winter just past, a very large quantity of grain has been moved from Fort William and interior points in the west, as well as from Port McNicoll, and the conservation of motive power, cars and labor that has been achieved by insisting on capacity loading is most encouraging.

The handling of grain as above described, however, particularly in the case of export shipments, is something over which the railroad exercises more or less complete control. Some difficulty has been experienced in prevailing upon shippers to load heavily, as in many cases their expense of loading would be increased, and the shortage of labor made

it hard for them to secure men who would undertake the more severe work of loading, say, a car of flour to the roof. In many instances the smaller consignees did not care, or were unable to invest sufficient money to purchase a full carload of goods, preferring to order only sufficient to conform to the weight published in the tariffs. In other cases it was found that loading regulations promulgated by departments of the Government having charge of the handling of munitions prevented shippers from fully using the cars placed at their disposal, even if they were so inclined. These and many similar conditions tended to discount the efforts that were being made by the railways to preserve economy in freight transportation, and it was evident that before the end sought could be obtained it would be necessary to secure the whole-hearted co-operation of the public.

In seeking some striking manner in which heavy loading and its attendant benefits might be placed before the shippers, consignees, trade organizations and others concerned, it was decided to issue in graphic form some figures showing exactly what might be done by the public itself, somewhat similar to a circular issued to employees of the Canadian Pacific in 1914 by Alfred Price, assistant general manager. Figures were drawn from the government statistics indicating that by increasing the average carload by 5 tons during 1917, as compared with the record of 1915, it would be equivalent to placing many thousand additional cars in service. Copies of this circular were mailed to all boards of trade and trade journals, numbers were sent to representatives of the company throughout the country, copies were furnished to connecting roads, a copy was mailed to each shipper and consignee writing to the railway about his freight, and every other opportunity of placing the matter before the public was seized as it presented itself. The response on the part of a large number of the company's patrons was immediate, and not only did they give assurance of their intention to co-operate but issued circular letters on their own account to their customers, impressing upon them the importance of "ordering a carload." Many applications were received for additional copies of the circular, one large shipper calling for 2,500 which were distributed to all concerns having dealings with that company.

Of this circular, or "Bulletin No. 1" 30,000 copies have been distributed. "Bulletin No. 2," which is of a follow-up nature, is now ready for distribution. The third circular is in course of preparation, and it is the intention to issue a series of notices of this kind until it is felt that the subject has been thoroughly advertised. In addition to the bulletins, a printed notice has been prepared which will be in the nature of a particular appeal to consignees, and a small sticker is used for attachment to replies to communications having to do with the supplying of cars and similar matters, this sticker bearing the words, printed in red ink, "Reduce car shortage by filling cars."

The systematic checking of freight waybills and weighing reports is being gone into more vigorously than ever, and where it is found that cars are being lightly loaded, the shipper and consignee are either visited or communicated with by letter, and the suggestion made that they can "do their bit" in helping to cope with the present trying situation by exercising economy in the use of freight cars.

At some of the larger centres inspectors have been placed and these men look over cars as they are opened so that data may be obtained that will enable the railway to get in touch with shippers of light-weight goods who, while they cannot load a car to its full weight-carrying capacity, may be able to use the entire cubic capacity. This has also brought about some good results particularly in the case of such commodities as pulpwood (of which a great quantity is handled in Eastern Ontario, Quebec and New Brunswick) lumber, packing-house products, etc. As the result of an interview with one packing concern, a shipment for which 10 refrigera-

tor cars were about to be used, was placed in 7, and the haulage of 3 cars for a round trip of over 5,000 miles saved. In another instance, a flour milling company, having received an order calling for 16 cars, got in touch with the consignee and was able to arrange for the consignment to be loaded in 10 cars.

In certain localities where a great deal of loading takes place committees have been appointed for the purpose of visiting shippers and soliciting their co-operation, and good results are being obtained from that source. At meetings between the public and representatives of the railway "loading of cars" is invariably introduced, and as opportunity presents itself it is the intention to call meetings of the larger dealers, and tell them at first hand what they can do in the way of assisting the railways to give them better service.

Government bodies such as the Department of Overseas Transport and the Imperial Munitions Board have been approached and asked to lend their assistance in the prosecution of the campaign, and the help received from that direction is most encouraging. Controlling as they do the manner in which goods shipped on their orders shall be loaded, these organizations have been able to issue instructions and to amend orders previously placed so as to ensure capacity loading in a large majority of cases.

In looking over the results of the efforts made thus far we find that during the month of February, 1917, the average weight of carload of export freight moved to West St. John was nearly five tons heavier than was the case a year ago, this increase being equivalent to one more trainload of freight per day in the same number of cars. On another portion of the line where a great deal of light-weight freight is moved, there was an increase of 20.1 per cent in the average load per car during March, 1917, as compared with March, 1916, and that during the same month nearly every division of the railway in Eastern Canada shows a gratifying improvement as against the record of a year ago. The average freight tons per loaded car mile for the entire line east of Port Arthur in March, 1917, eastbound, was 28.6, an increase of 8.3 per cent over the same month for the previous year, and westbound, an increase of 8.8 per cent. Perusal of the current records for April leads to the conclusion that the performance for that month, as shown in the summarized statistics (which have not yet been issued), will far out-strip that of March, and it is felt that as the movement to "increase the load and decrease car shortage" gathers momentum, the result will be far beyond anything that was considered possible a few months ago.

LOADING COMPETITION ON SOUTHERN PACIFIC

Prizes will be awarded to agents on the Southern Pacific, Pacific system, whose stations show the best records for car loading between July 1 and December 31. Only agents at stations handling at least 40 carloads of revenue freight outbound during the period will be eligible for the competition. Awards will be made on the basis of the greatest improvement shown in the loading of 18 separate commodities—number 13 being I.C.L. freight—over the previous records made at the same stations between September 1, 1914, and June 30, 1915, when a similar competition took place. For each commodity a first prize of \$50 and a second prize of \$25 will be awarded, but no station will be considered in the award of first prizes unless at least 10 cars of the commodity under consideration have been loaded at that station during the period. A station loading as many as five such cars will be eligible for second prizes. A separate competition with a first prize of \$50 and a second prize of \$25 for loading I.C.L. merchandise has been arranged for the following cities only: San Francisco, Cal., San Pedro, Los Angeles, Stockton, Oakland, Sacramento, Fresno, San Jose and Portland, Ore. These cities are not eligible for first or second prize for I.C.L. loading

in the general competition. In addition, a prize of \$15 for each commodity will be awarded each month to the station making the greatest improvement for that period when compared with the average per cent of load to car capacity obtained at the station during the 10 months ended June 30, 1915.

FURLOUGHS FOR PENNSYLVANIA EMPLOYEES WITH THE COLORS

Any employee of the Pennsylvania Railroad who responds to the call to arms is granted a furlough by the company for such time as he may be engaged in state or national military or naval service. He is also allowed to retain the same privileges of free transportation to which he was entitled when engaged in the active service of the railroad. Credit will also be given, in computing pension allowances, for such time as the men are engaged in this service. This announcement is given in a general notice to all employees issued on June 27 by General Manager Elisha Lee. The notice follows:

"The board of directors of the Pennsylvania Railroad has taken formal action providing for the retention in the service of any employee of the company for such time as he may be engaged in state or national military or naval service in response to a call to arms in the event of war or other emergency. This applies whether they may be members of the National Guard or not.

"Heretofore the rule of the company has been that a furlough from active service could not be granted for a period longer than nine months. At the time of the Spanish-American war, employees who engaged in military or naval service sacrificed their positions, as the period of enlistment exceeded their furlough, although following the war every effort was made to find places for the men who had left on that account.

"Under the plan now adopted, employees shall be granted a furlough during the time they may be engaged in such military or naval service, and credit for the time absent will be given in computing pension allowances of employees so furloughed.

"Furloughed employees while engaged in military or naval service will be entitled to the privileges of free transportation the same as when engaged in active service of the company.

"The advisory committee of the Voluntary Relief Department also took action on this resolution, and the effect will be that during the continuance of such furlough by the company, a member engaged in military or naval service may continue his membership in the Relief Fund, and, if he keeps up his contributions, will be entitled to the benefits of the fund provided for any member who is on furlough. In cases of disability, in order to be entitled to Relief Fund benefits, employees will be required to advise cause of disability, furnishing name and address of military officer giving medical attention, and have company commander furnish memorandum showing number of days off active duty because of such disability.

"The company is sincerely interested in the welfare of its employees engaged in military or naval service, and has established a special bureau in charge of G. W. Buzby, special agent, with office in room 628 Commercial Trust building, Philadelphia, Pa., to look after their interests. The duties of this bureau will be to keep in communication with such furloughed employees either by personal visits or correspondence, and to act as a medium for the exchange of information between them and their families and friends at home; and to render any assistance consistent with the object of the bureau and the requirements of the men. Furloughed employees are requested to keep this bureau advised of their military addresses."

DENVER & RIO GRANDE SUFFERS HEAVY DAMAGE FROM FLOOD

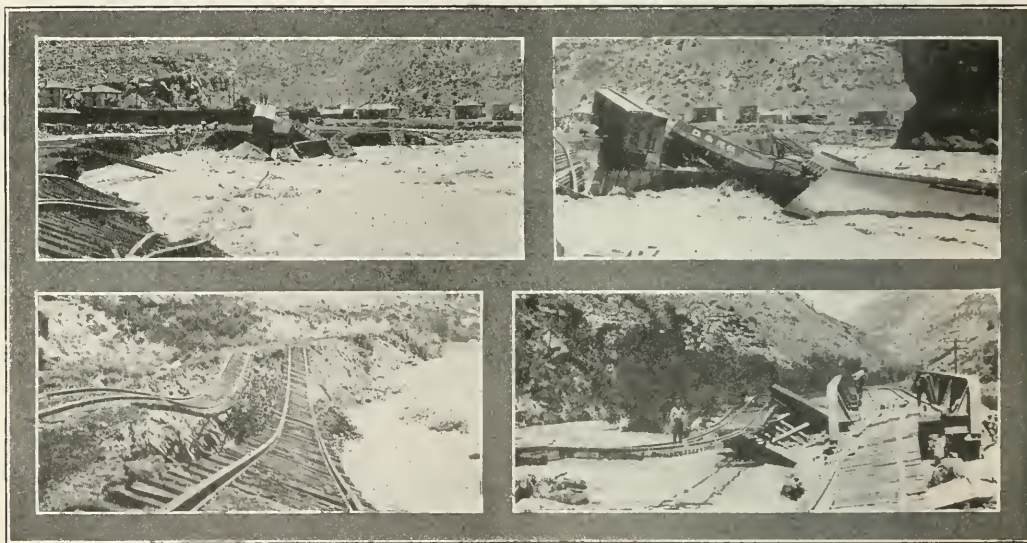
The recent failure of the Gooseberry creek dam which serves to impound water for irrigation purposes in the vicinity of Price, Utah, resulted in heavy damages to Denver & Rio Grande property and the suspension of traffic between Denver, Colo., and Salt Lake City, Utah, for several days. Those portions of the road affected were the double-track main line which parallels the Price river through a canyon from Helper, Utah, to Colton, a distance of 18 miles, and a branch line running 21 miles south from Colton to serve the coal mines located at Scofield and at Clear Creek. The line of this branch follows in general a tributary of the Price river.

The Gooseberry reservoir is situated on Gooseberry creek, the tributary of Fish creek which, in turn, flows into the Price river. On the afternoon of June 24 telegraphic advice of the failure of the dam was received by D. & R. G. officers. The water courses which generally parallel the

ft. to 750 ft. in length. While this stretch of road is not generally high above the elevation of the normal flow of the Price river, sections of the roadbed, 30 ft. or more in height, were washed out at several places.

A bridge leading to the Panther mine and one on the tracks serving the Spring Canyon Coal Company and the mines of the Standard Coal Company were washed out. The Utah Fuel Company also suffered serious damage, but by dynamiting one of the railroad bridges and using rails to protect the banks, the large tippie used by the company escaped with comparatively light damage. The flood also washed away eight residences and two business houses at Castle Gate, three dwellings at Carbon, a mining camp about two miles to the east of Castle Gate, and five dwellings at Helper.

The Gooseberry dam impounded 11,000 acre feet of water or virtually 17 square miles of water a foot deep. The heavy snows of the past winter did not begin to melt until the arrival of hot weather, which came about six weeks later than usual without the warm spring days which usually pre-



Yard Destroyed at Castle Gate, Utah
One of 14 Washouts, 350 to 750 ft. in Length

Another View at Castle Gate Where Seven Cars Were Washed Into River
One of the Bridges Destroyed

Flood Views on Denver & Rio Grande

railroad were not affected until Monday, June 25. At this time the water began to rise rapidly and on the evening of June 25, reached the highest stage at Castle Gate, Utah. About five miles of the Scofield branch was almost completely destroyed so that practically entire reconstruction will be necessary. At numerous points in the Price river canyon between Colton and Helper the roadbed, although very largely of rock construction, was destroyed and two bridges consisting of double-track steel girders on concrete masonry substructures were washed away with practically complete destruction of abutments. Besides these bridges, several others were either destroyed or damaged so badly that heavy repairs were necessary. The greatest amount of damage was concentrated at Castle Gate, where the canyon is particularly narrow. At this point several sidetracks, both main tracks, the depot, a water tank and several cars were destroyed, the station building being completely obliterated. There were 14 washouts on the main line ranging from 350

cede summer temperature. As a result, the water from the snows was unusually great and came all at once. Exactly what caused the dam to give way has not been definitely determined, but a semi-official report of the state engineer states that the temporary spill-way was inadequate to handle so large a volume of water. When it was reported that the dam was breaking, the residents of the towns along the Price river at once moved to nearby mountain sides with their household goods and stock. When the water did come, there was little left in most of the towns except the empty houses. Only one life was lost. After passing Helper, the flood spread into a broader valley and the damage to property was much lighter than in the canyon.

By constructing shoo-fly tracks in some places, swinging the good track over toward the mountainside in other places, and cribbing where both main tracks were down, a single track line was opened for through traffic between Denver and Salt Lake on July 4.

Increasing the Tonnage of Freight Trains

The More Important Principles Emphasized in Six of the Discussions Received in the Contest on This Subject

THE two prize winning papers received in the contest on the subject of Increasing the Train Load, and two other papers were published in the issue of June 22. Six other papers which were received in this contest are included in this article. While the subject of securing full train loading has received very close attention on individual roads during recent years it has never been given as widespread attention on all roads as at present when the demand for the full utilization of all railway facilities is so pressing.

A TONNAGE BUREAU

By M. E. Burke.

Norfolk & Western, Roanoke, Va.

Operating officers have their hands full with the routine duties of operation and with continuous demands to furnish information of various kinds to the different legislative bodies. As a result they have not the time necessary to deal intelligently with this important problem. Every railroad of any considerable size, therefore, should establish a special bureau to deal with the question of train loading.

The field of this bureau is very broad, yet very definite. It can be outlined in this way:

A. To determine the most economical maximum tonnage ratings for each class of locomotives in the different services on each district of the system.

B. To replace gradually the old method of tonnage rating by the new—that of rating according to train resistance or drawbar pull.

C. To ascertain the most economical combination of power to be used in each class of service where more than one locomotive per train is used.

D. To see that each terminal where trains are being made up is furnished with sufficient information in ample time to avoid, when possible, the use of light power in both directions.

E. To be sure that the yard offices are guided by the official ratings and are computing the train tonnage correctly.

The first step in determining economical tonnage ratings does not call for the use of a dynamometer car. I have found it very profitable when entering a new field to make a complete list of all the tonnage ratings existing on the system; to determine the ratio of the tonnage ratings of the different types of locomotives in the same class of service on each district of the system; and to determine the ratio of the tonnage ratings of the same type of locomotives in different classes of service on each district of the system. Such information very often surprised the local officials. In cases where similar classes of locomotives were used on several districts, a variation of from 40 to 50 per cent in the ratio of the ratings would not be uncommon. The following table illustrates the point:

	A	F	C	D
(1)	100%	95%	80%	60%
(2)	100	55	85	70
(3)	100	70	75	55
(4)	100	98	82	59

Classes A, B, C and D are different types of locomotives—all in one class of service. Lines 1, 2, 3 and 4 refer to different districts of the system. Class A is taken as the basis of comparison, or 100 per cent. The relation of the remaining three classes of locomotives to A shows the inconsistency of our present ratings.

Similar results were obtained by tabulating the different percentages of cuts allowed for time freight trains as compared with corresponding slow freights on different districts of the system, special attention being given to the speed re-

quired in each case. Here, too, a surprising variation was detected.

The local officials, having been furnished with this information, have taken the matter up with their trainmasters and chief dispatchers and gradually raised the ratings that fell below the average ratio. Uniformity and gain in ratings were thus obtained over the system. These were very profitable, for in all cases ratings were raised and never lowered.

The next step in getting at the most economical maximum ratings is to go over old train performance sheets for a period of time, pick out those trains with the highest total tonnage hauled and analyze the time made by them in getting over the line. The trains with both average performance and economical time on the road will indicate whether or not the official tonnage ratings are high enough. These steps usually bring the ratings up considerably, even if not to the highest point of economical practice.

Great judgment must be exercised in carrying on this work. It must always be remembered that the road and power conditions are not the most trying features to be considered. The greatest opposition, if any, to be met is that of the men. Human nature, as a rule, opposes anything new. This is especially true in dealing with organized labor. The most important qualifications of the man in charge of the bureau under consideration are those of being a good mixer, of being capable of stirring up enthusiasm in every one connected with the handling of trains, and of cultivating an atmosphere of co-operation instead of an attitude of checker and checked.

Thus all concerned will become accustomed to the term tonnage rating and will be interested in making as good a showing as any other division on the system. The idea of new tonnage tests is no longer foreign. The time is ripe to introduce the latest scientific way of rating trains—that of substituting the resistance of the train for its total actual tonnage. All operating men know that trains with the same total tonnage but with different numbers of cars are not handled with the same ease. They all agree that a train with 50 forty-ton cars is harder to get over the road than a train with 40 fifty-ton cars, all other conditions being equal. To overcome this difficulty the factor of resistance must be introduced on each district in connection with its most economical rating. This factor should be determined by a series of tests with the proper combinations of cars. It should take into consideration the average weight of the cars handled on the district, the controlling grades and their length, position and frequency.

Some roads use the train resistance computer for this purpose, but I am inclined to think that its mechanism is too susceptible of mistakes by the yard clerks. It requires very careful manipulation and even then very often gets out of adjustment. One of the large roads, I believe, is following the method of inserting the average factor of resistance on each table of ratings in both directions for each district on the system. These tables are usually compiled in pamphlets, each pamphlet containing the ratings for one division and the general instructions being given on the first page.

The third phase of the work—that of providing the most economical combination of power to be used in each class of service where more than one locomotive per train is used—is one of the most difficult tasks of the bureau. It requires a thorough knowledge of the physical and climatic conditions of the road and also of the nature of the freight handled. Frequently no iron-clad rule can be applied to any terminal

to be followed in making up trains. The local people must be made to appreciate the absolute necessity of watching and weighing the situation in hand continually. While it is profitable, as a general rule, to haul trains with rated tonnage, it would be quite uneconomical to follow this when it becomes necessary to equalize power. Double-heading trains all the way, using helpers part of the way, pushers over controlling grades, and turn-backs are some of the methods that may be used in solving these problems. Very much can be said pro and con regarding each of these methods, but their merit depends largely upon the local conditions.

In connection with this part of the work it would perhaps be of some value to outline a general policy as a guide for such a bureau in its endeavor to fix economical combinations of power for the most efficient handling of trains. Our railroads are being subdivided continually into new divisions and districts. While this is necessary for efficient operation, it has at least one disadvantage that some of our operating men fail to overcome—they soon become engrossed in their local conditions and lose sight of the very important fact that the districts under their jurisdictions are but links of the one big chain which comprises the entire system. It often holds true that a heavy competitive movement of some one commodity will be either originated or delivered to a road at a point necessitating its passing over several districts of the system before reaching its destination or connecting line. These districts, as a rule, have different physical conditions; necessarily some classes of power would be rated differently on these districts.

The idea is to meet the road conditions, when possible, by changing the combination of power used, instead of by breaking up the train. A train then would be able to pass over the entire line in its original make-up and avoid the greatest part of terminal delays now entailed in breaking up the old and building the new trains. The benefits gained by changing the combination of power instead of the make-up of trains cannot be enumerated so easily. Instances have been known of cars losing their identity, traveling in manifest trains part of the way, in slow trains part of the way, and even experiencing association with local trains. The tracing of delayed cars would be very much curtailed and an all-around better service would be gained which is, after all, the best advertisement a road can have.

The fourth—that of providing the terminals with sufficient information in ample time to avoid unnecessary use of empty power in both directions—is somewhat more complicated than the preceding phases. The problems heretofore were originated and solved within the bounds of one system. We now come to a problem, the solution of which very often depends upon the co-operation of many systems. Most of the waste of running light power in both directions takes place at junction points, owing to the lack of co-operation between connecting lines in exchanging transportation information. The reason given in such cases is usually "unexpected business." Why should there be such conditions? The cars were in transit for some time before they reached the junction point. It was, therefore, not a case of "unexpected business," but that of "unannounced business." There is no question as to the benefit to be derived from such information if it can be made reliable and transmitted in proper time. All realize the value of such co-operation, its feasibility, and comparatively small cost, yet no one has taken the initiative in bringing it about.

The fifth and last phase mentioned is the necessity of ascertaining whether or not the yard offices are guided by the official ratings and are computing train tonnage correctly. It was stated truthfully that every man, no matter what his field of endeavor may be, will do better work when he is being checked and compared with others. Many a good method has been installed on different systems which has gradually lost its effect on account of not being supervised and checked.

Having worked out the proper ratings, and combinations of power, and having provided, as far as possible, the transportation information necessary for the terminals, it remains to provide the necessary means to enable the bureau to be in constant touch with the entire workings. It must arrange for a daily report compiled under the supervision of the chief dispatcher or trainmaster for both directions in each district, showing the following information concerning all through freight trains leaving their terminals during each 24 hours: the train number, the time of departure, the class or number of the locomotive or locomotives, its or their ratings, the actual tonnage at departure, and the change of tonnage, if any, while passing through certain specified points on the district. The report should also include reasons for sending out trains underloaded.

Such a report will enable the bureau to make monthly statements, showing the tonnage lost on any district, as well as its causes. In many cases the management may decide that it will be profitable to undertake to remove the causes of some of the losses, while in others the judgment of the men in charge of the making up of trains may be criticised and new instructions issued. Monthly charts displaying the daily operation of through freights by districts have proved very helpful in maintaining interest in this work. The men in charge of the bureau must have time to get around as often as practicable and discuss the train load situation with individual yard offices. Letters are never as efficacious as personal interviews.

The problem thus resolves itself into the following: The management should organize a special bureau to deal with the "train load." The bureau should have a personnel sufficient to enable the man in charge to leave the office whenever he finds it necessary to make a tour over the system. It is preferable for this man to have a scientific training in addition to a practical knowledge of transportation for his work is largely that of research. He must be able to keep his theories under cover when outside his office, for only then will he succeed in his main task—that of creating and maintaining co-operation. The bureau is to analyze the existing transportation conditions, ratings, combinations and distribution of power used, to standardize practices and to follow applications and effects. It must carry on its work by leading instead of driving. Monthly charts showing operating results and comparisons are to be employed. The charts should be plain, requiring but very little effort on the part of the general and local officials for their analysis. Scientific terms are to be avoided when possible, most especially when they can be replaced by colloquial railroad expressions. The bureau should start on a comparatively small scale and work its way up until it includes all branches affecting the efficient operation of trains.

THE APPLICATION OF SIMPLE PRINCIPLES

By O. S. Beyer, Jr.

Railway Engineering Department, University of Illinois, Urbana, Ill.

The primary object of increasing the train load is to move freight more economically. Before improvements can be made in this direction it is necessary to be able to control the loading and operation of trains in strict accordance with all those elements which have an effect on economical freight train movement. This control can only be secured when it is understood how these elements affect train loading and when a workable system is adopted which takes into account the relation of these elements to train loading.

For the purpose of adopting a train loading system, or checking up and improving it, if one is already in use, the services of a dynamometer car are valuable but not indispensable. Train loading or tonnage tests can be made daily under the supervision of a train master or a road foreman of engines in collaboration with the chief dispatcher if they

understand the principles. Different tonnage trains consisting first of heavy cars and then of light cars should be run over the division, and their performances compared. Results secured thereby, together with calculations based on the profile and locomotive characteristics, should furnish a basis upon which to establish a rational flexible tonnage rating system. This having once been done and a start made in the direction of adjusting train weights scientifically to the hauling capacity of the motive power many chances will immediately crop up to improve the average train load.

First it will be discovered that the question of accurate train weights is of greater importance than ordinarily imagined. Why? If it is not possible closely to determine the actual weight of trains as they are made up in terminal yards it will not be possible to load the motive power uniformly in accordance with its hauling capacity. Thus one train will perform differently than another, overloading, stalling, or consuming excessive time from station to station in one case, and in underloading and loss of engine and train crew efficiency in the other. A distinct economic loss follows exactly in proportion to the degree of inaccuracy which prevails in making up train weights.

Every effort should therefore be made to get individual car weights as correct as possible. Since train weights are almost invariably determined from the car weights entered on the way bills a campaign should be started to have the actual car weights carefully entered on all way bills as soon as they are originated. A close check of this situation on most railroads will reveal a very clear opportunity for improvement. Empty car way bills particularly are offenders. All that is necessary for an agent or a clerk who originates such bills to do is to look at the light weight stencils of the empty cars and enter them on the bills. When train checkers or conductors find such bills they should be instructed to enter the car weights when they check their trains.

Another important matter in this same direction is the proper determination of the weights of cabooses. Freight train cabooses are usually thrown into the whole train weight at 15 or 20 tons each. As a matter of fact they may weigh as much as 30 tons. All cabooses should be weighed with their full equipment on board, their weights clearly stencilled on the sides, and then treated the same as any other car in the train. Guess work and lazy man's work should be discouraged and eliminated by example as well as preachment.

The next thing which will be discovered is the improvement which will follow by loading cars more nearly to their capacity. The greater the individual car weights are, the more tonnage can be hauled in a train, for freight train resistance does not increase in direct proportion to the increase in the weight of cars. A loaded car of 75 tons which is $3\frac{3}{4}$ times as heavy as an empty car of 20 tons only pulls $1\frac{3}{4}$ times as hard as the empty car on a straight and level track at the usual freight train speeds. A knowledge of this fact alone should be a sufficient reason for every one interested in increasing the train load to try and get more load into individual freight cars.

Another very important opportunity for improving the train load lies in the proper making up of trains so that as many loaded or heavy cars as possible are placed into each one, thus avoiding the running of trains composed of empty or light cars. This arrangement will often prevent sending trains out which have had to sacrifice tonnage on account of having reached the car limit. Hence whenever there is a heavy movement of empty cars a great effort should be made to get loads into each train. A little foresight in this direction will go a long way, and alert division officials will find opportunity, when empty car movements are heavy, to protect the tonnage of individual trains by accumulating some heavy cars containing slow freight and distributing them judiciously in light car trains.

The importance of the element of time in train movement

will be appreciated much more than ever before. One of the reasons most frequently advanced regarding the impossibility of loading locomotives to their maximum capacity is that trains so filled out take too long to get over the division. It never seems to occur to those who are responsible for such a statement to make improvements which will save train time for the purpose of making possible greater train loads. Many opportunities present themselves continually in this direction and the first ones to realize their significance should be the train master, the road foreman of engines and the chief dispatcher. Their spirit should be such that they are always on the lookout for a chance to save a few minutes as each train makes its way over the division. They should everlastingly be driving this point home.

Many little physical improvements along the right of way and to the motive power will help accomplish this same object. Telephones should be installed at passing sidings to enable train crews to get into quick touch with tower men or division operators in order to get needed information instead of wasting time to walk a mile or more to ask for it. The lengthening out of passing sidings to prevent trains sawing by not alone saves time, but also permits increasing the car limit. Occasionally the installation of a crossover makes possible the utilization of the opposite main track in order to keep trains moving. Improvements to locomotives such as the application of brick arches and superheaters make it possible to operate trains at higher speeds over the division. The true worth of such betterments becomes doubly significant in the light of saving train time with the ultimate object in view of increasing the train load.

Lastly and above all else it should become apparent to the management of a railway organization that one individual at least should be included in the organization who is the best authority they can secure on this matter of train loading. The discharge of his duties should be confined solely to this field. He should be the pacemaker in all matters seeking to increase the train load. A careful systematic study of all the problems involved should be followed by suggestions, recommendations, and the initiation of such steps as will help effect the desired improvements. He should work with the division officials, getting from them the benefit of their experience which results from their intimate contact with the daily problems of operation, and apply it to his studies of the train-loading question. He should enlighten them on the principles underlying his work, develop in them an appreciation of the importance of the problem, encourage them to co-operate with him, and in general prepare the ground for an active campaign on the part of every one to help increase the train load. As the leading authority of the organization in his field, his assistance should be sought by all who are anxious to improve their loading conditions. He should be consulted on all the questions of physical property and operation improvements which affect the problem. An energetic man with a sound training in the fundamentals of train loading science, having had experience in the practical application of these fundamentals, will prove astonishingly valuable.

SOME OF THE REMEDIES

By C. B. Wildman

Division Superintendent, Missouri Pacific; Jefferson City, Mo.

In order to secure and maintain an increased train load effectively, it is important, and in fact absolutely necessary to proceed along definite lines. It is an easy matter to formulate some plan and issue instructions accordingly, but it is an entirely different matter to have such instructions rigidly complied with; therefore, the success of whatever plan of campaign is decided upon will depend almost entirely upon the manner in which it is followed from day to day. Perfunctory or occasional checking will not secure the desired result, and a definitely fixed train loading can only be maintained by checking carefully the tonnage of each train every

day. A very good plan is to provide space on the train sheet for dispatchers to show each train with light tonnage and the cause. This will also assist in reminding the dispatcher of his responsibility in seeing that this important feature is not overlooked.

The first thing is to establish the maximum rating of the engine definitely. The superintendent, trainmaster and master mechanic or road foreman of engines, should satisfy themselves by actual tests as to what the engine will handle under favorable working conditions, bearing in mind the theoretical rating, and endeavoring, if possible, to reach that or better. Once the maximum rating is established, the engine should be rated accordingly and the division officers and employees should be required to interest themselves sufficiently to see that the rating is maintained, due allowance being made for weather or other adverse conditions. Care should be taken to see that the yardmaster is interested in getting each train out of the terminal with its full tonnage. Too many trains leave the terminals a few tons short. The last car should be put on to bring the tonnage up to, or a few tons over, the rating. If this practice is closely followed it will result in a material saving of train miles in the course of a year.

It is the practice on some roads to run empties in solid trains, giving them the car limit, but not always the train load. This is sometimes necessary in emergency, such as an extreme shortage of certain classes of equipment, but it is important to see that the practice is not indulged in unnecessarily, as it is more desirable from a tonnage viewpoint to handle trains of mixed loads and empties in order to shorten the train and haul the maximum load.

Another cause of loss in tonnage is the indiscriminate handling of short loads and empties on through trains. Such business should be confined to local freights, and where the business amounts to more than the local freight can handle, it should be bunched and handled in one train each day. This train can either be filled out on the line, or turned at some convenient point after it has fulfilled its mission. The handling of short loads on through trains not only results in delay but usually in the train running with light tonnage in the direction of traffic over at least a part of the district.

I believe one of the most practical means of increasing the train load, and one that has probably been given the least attention, is that of increasing the car load, in other words, loading the car to its capacity. Fifty, and perhaps 75 per cent of all the cars handled are only partly loaded. One can readily understand the effect of these partly loaded cars on the train load, and the remedy does not lie altogether with the Interstate Commerce Commission, although, in my opinion, a definite campaign toward the accurate compilation and proper presentation of certain information to that body would, in course of time, bring gratifying results. In the meantime, it is within our power to improve this condition and secure some measure of relief. Our patron, the manufacturer, is a business man. He can see at a glance that it is not good business for a railroad to haul a car 500 or 1,000 miles containing only half a load. He can, and often will, instruct his salesman to sell a heavier load. He is in a position to give his customer a good reason why this is necessary, and the influence of the jobber over his customer should not be underestimated. We should show this patron of ours that we are interested in him and that we are willing to lend our aid to make his business a success. When we do this we can expect his friendship and co-operation, not only in the temporary relief before mentioned, but in the securing of permanent relief which we have a right to expect will be given later on.

Many railroads are operating long freight districts, some of them 150 to 170 miles. It is an impossibility to move trains of maximum tonnage over such districts, because their movement must necessarily be slow. This, together with the

usual unavoidable delays, such as meeting and passing trains, cleaning fires, crews stopping for meals, hot boxes, etc., will, in many cases, prevent the movement of the train over the district within the hours prescribed by law. It is also probably true that the full efficiency either of the engine or the employee cannot be obtained on such districts. Given a freight district of approximately 100 miles, there is no apparent reason why the locomotive and the man should not render efficient service. It is not necessary to provide an elaborate freight terminal every 100 miles to put such a plan in operation. A few tracks will take care of the situation, as no switching or breaking up of trains would be done at these points. The engine's fire should be thoroughly cleaned, a fresh train and engine crew put in charge and the train could proceed with little delay, and its maximum tonnage. The answer would be found in the road's statement of operating expenses.

Another source of lost tonnage is found in the handling of "time freight" schedules. For a number of years the railroads have been in sharp competition with each other in shortening freight train schedules at the expense of tonnage. There does not seem to be any adequate reason why a business man can reasonably expect to purchase an ordinary bill of goods in Chicago and have them delivered to him by freight in St. Louis, about 300 miles away, the following day, nor does there seem to be any good reason why brick, lumber and other such commodities should be symbolized and classed as time freight, except that "they all do it."

Stock, perishable freight and merchandise, properly belong under the classification of time freight, and should, of course, be handled as such, making whatever reduction in tonnage necessary to maintain the schedule. Dead freight trains should be run with as much regularity as possible, bearing in mind the importance of the full train load.

THE USE OF TONNAGE DIAGRAMMS

By J. J. Glass

Chief Draftsman, Chicago Great Western, Chicago, Ill.

Divisions on some roads are too long. On engines with long fireboxes, and firemen nearing the end of a long run and tired out, most of the coal is placed at the rear end of the firebox and not enough at the front end, thereby securing an uneven fire surface, resulting in a drop in the steam pressure and consequently reducing the effective tractive effort of the locomotive and generally the stalling of the train. This seems to be a reasonable explanation why some locomotives will pull a certain load over a hill, while others are required to "double over," both trains consisting of approximately the same tonnage. In such cases, the possibility of giving the firemen more rest between trips or a change in the division points should be considered, or in lieu thereof, a "relief point" for the crew, or the adoption of mechanical stokers, which are no longer an experiment.

Where possible, enginemen should approach the bottom of a hill at a speed which will enable them to acquire sufficient momentum to carry the train over; except in cases where the hill is too long and the momentum acquired would fall to zero before reaching the summit, in which case the tractive effort of the locomotive must alone be depended upon to carry the train over. (The Chicago Great Western operates 1 per cent grades approximately one mile long as velocity grades, passing the bottoms of hills at 25 miles an hour.) Diagrams should be prepared to show the distance in feet that a train's momentum will carry it on various hills for speeds varying from 10 to 40 miles per hour. The profiles should be studied with the help of these diagrams as it may be possible to operate a division or subdivision entirely on momentum grades, even if one hill should be too long, it would pay to double over, considering the excess in tonnage handled.

Some railroads have found in actual practice that the

theoretical engine rating used was inadequate; that the constant of resistance (4-6) used in figuring the rating was too high. In making up trains, yardmasters did not consider whether the cars were fully or partially loaded, or empty. In other words, it was not the practice to equate the rating to the number of cars. Even now some roads use the old practice of loading a train until the engine rating is reached, and they then wonder why the locomotives stall and are compelled to "double over" certain grades. (See Fig. 2.) This is, nevertheless, the everyday experience of most railroad men, and it is attributed to the fact that they have failed to consider the number of cars in the train.

Some roads use adjusted ratings, i. e., adding a certain car factor (5 or 6) to the weight of each car, and then adding together the weights of cars plus the car factors until the adjusted rating is reached. Fig. 3 shows the resultant loss in tonnage.

In order to obtain the maximum tonnage that an engine is capable of handling on ruling grades, the following rules should be observed: Engines should be tested to ascertain

tonnage that the particular class of engine is capable of hauling over a certain district without stalling.

Figure 1 represents an equated tonnage diagram used by the Chicago Great Western under ordinary weather conditions, with the temperature above 32 deg. C represents the point on the tonnage curve ordinarily arrived at in calculating engine rating, using 5 lb. per ton as train resistance. The shaded portion A, C, E, Fig. 2, represents the loss in tonnage if this practice is adhered to, while the unshaded portion C, B, D, Fig. 2, represents the chances of stalling if the train contains more than 84 cars, the engine being rated for 1970 tons. A, F, Fig. 3, is the adjusted tonnage rating, and the shaded portion A, B, F represents the loss in tonnage.

SECURE THE CO-OPERATION OF THE MEN

By Stephen H. Brown

Chief Dispatcher, Great Northern; Melrose, Minn.

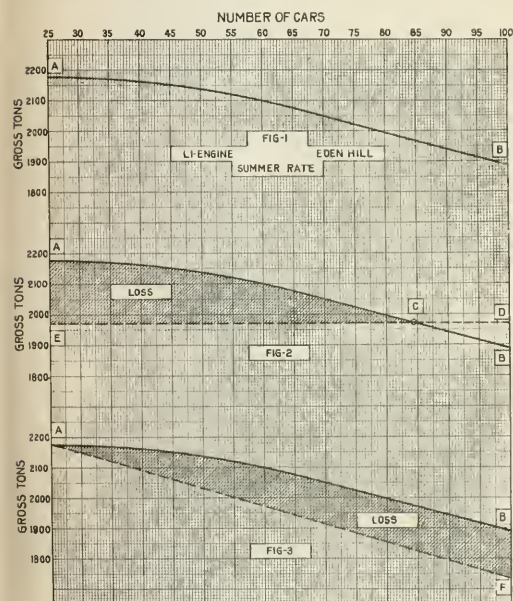
One of the first essentials in an endeavor to increase train loading is to inspire trainmen and enginemen with a feeling of pride in their achievements. How best to bring about this desirable result is a problem in itself worthy of the most careful consideration.

Under present methods of operation little or nothing is left to the discretion of conductors and engine drivers. An engine is rated at so many tons, and certain handicaps are permitted such as the deduction of a stated number of tons per car where a given number of empty cars are handled. It is this method of rating trains which puts into the minds of trainmen the mental attitude many of them have acquired.

A practical case in point illustrates what I mean in an illuminating fashion. A heavy movement of empty cars was being made on a transcontinental railway. The engines were rated at 1,500 tons, which they handled successfully. The rating sheet authorized a handicap of 6 tons per car for all empties over 20. The cars were principally box cars, running 17 to 19 tons light. Trainmen and yardmen rated these trains on the basis of 17 tons for the first 20 and 23 tons for the remaining cars, and were handling 69 to 70 cars per train. The performance indicated light-loaded trains. An arbitrary 90-car limit was established, which was later raised to 95, and this brought the performance to correspond with loaded trains.

As a matter of common knowledge among men actively engaged in train operation, and the administration of the problems involved, actual tonnage does not always indicate train resistance. What is needed is a simple formula for the guidance of simple men (and this is not said in derogation). Engine ratings based upon tractive power and other technical data are not entirely satisfactory, nor does a test rating offer a reliable solution of this important problem. Such ratings usually are made under favorable conditions with the supervision of trained officers assisted by selected employees.

"A chain is no stronger than its weakest link," aptly describes the condition which exists upon a railway in its efforts to establish workable train ratings. We all know that Jones, for example, is a more efficient performer than Smith. Therefore, it is up to the railways to establish a minimum standard of efficiency for men before there can be a maximum degree of efficiency for machinery. When railways can rely upon employees to play a straight, fair game, it perhaps will be possible to secure the most profitable returns in train load that can be devised. The tendency now, unfortunately, is for employees in train service and elsewhere to share imaginary grievances with a too susceptible public, which is ever ready to aline itself against oppression. The dissatisfaction it feels is not the result of widespread mismanagement, as it believes, but of universal misunderstanding of the difficulties under which railway managements labor in striving to maintain a grip upon the situation against the



whether they are capable of maintaining the required steam pressure. Levels should be run on all ruling grades or at least on the hardest pull points. It may develop that the profiles are not identical with the present condition of the track. In calculating the tractive power, the mean effective pressure obtained from actual recent tests should be used. After having calculated the tractive power, equated tonnage diagrams should be prepared on graphic sheets as shown in Fig. 1. Each sheet should cover one class of engine over a defined district. In the preparation of the diagrams, the grade (compensated for curvature) should be selected at the hardest pull points, always considering the length of train. Proper and careful consideration should be given to wheel friction and weather conditions. Ordinarily three ratings, giving summer rates above 32 deg., winter rates between 0 and 32 deg., and severe winter rates below 0 deg., should be shown on every sheet.

In making up trains, yardmasters should be instructed to follow the diagrams closely, as they represent the maximum

opposition of those whose intentions, good or bad, serve only to clog the machinery of railway operation.

SOME OF THE ESSENTIALS

By E. J. Worden

Division Superintendent, Chicago, Burlington & Quincy;
Galesburg, Ill.

The first thing that has to be considered in making a tonnage showing is to have the motive power in condition to handle 100 per cent rating at all times. Every case of failure of an engineer or engine to handle full rating should be taken up with the mechanical department immediately to avoid a loss of tonnage on the next trip of that engine or crew. Slow orders over bridges or track at the foot of a hill deserves considerable attention to avoid having to reduce tonnage on trains to enable them to get up the hills after moving over this slow track. The fuel and water supplies should be satisfactory to avoid setting out trains or running light. This is especially true in cold weather.

On lines suitable for heavy power, everything possible should be done to avoid running small power. Short loads on any line should be confined to way freights or one short lead train. On lines where excess tonnage can be handled on either end of the run, cars should be accumulated to be used to fill out through trains.

READING MATTER FOR SOLDIERS

The railways of the United States are being given an opportunity to assist in providing reading matter for the soldiers. The War Department, through the Commission on Training Camp Activities, has asked the American Library Association to assume responsibility for providing adequate library facilities in the 32 federal training camps now being established for the National Guard and the National Army. The association has organized a war service committee, of which J. I. Wyer, Jr., of New York State Library, is chairman, and a sub-committee on transportation, of which R. H. Johnston, librarian of the Bureau of Railway Economics, is chairman. It is proposed to establish libraries at each of the training camps where books collected and donated by libraries, by publishers and by the general public will be housed in charge of two or more trained librarians who will, in addition to supplying recreational and general reading matter, seek out among the young men called to the cantonments and training camps those desirous of continuing courses of study or of undertaking reading to fit them for their occupations after the war.

An important practical problem is the transportation of the material collected under the auspices of the American Library Association to proper centers and this problem has been placed in the hands of Mr. Johnston, who is asking the various railway companies to assist in the work. Several railway companies have already indicated their willingness to transport as railway mail donations from persons on their lines to the most convenient terminals. Provision is made by the American Library Association for the prompt removal of these donations from the terminals by agents who will see that they reach the camps.

Some of the carriers have also arranged to prepare and place a poster notice calling attention to the need of the cantonments for books and magazines and naming places where officers with whom they may be left. They are also issuing orders to employees involved to parcel and ship in to the main terminal, where the books and magazines are removed by the agents of the library association. In a memorandum to the railways regarding this work, Mr. Johnston points out that within a few weeks nearly 1,000,000 men will be in cantonments, training camps or at the front. Among them will be men hitherto dependent upon and trained to

the use of books; men not so dependent and not so trained, who might under the unusual conditions be influenced by books; men taken from occupations or professions in which the books supplied to them would lessen to a degree the loss of opportunity caused by their country's call, and other men for whom merely recreative reading would be a beneficial influence to counteract the tedium and temptations of camp life.

Among the early war innovations in Germany was the organization of traveling libraries for the various army corps. Great Britain adopted a similar plan, by which every fortnight boxes of books are sent to every unit of the expeditionary forces. While the National Guard was encamped on the Mexican border the Y. M. C. A. and various libraries co-operated to furnish reading matter for the soldiers. In Great Britain transportation of books and magazines was handled both by the post office department and by the railways, which conveyed free of charge packages of books and periodicals despatched by properly constituted and recognized organizations. As the work will be in the hands of an organization representing the skilled library profession, the railways may safely be assured that such assistance as they may render will be most efficiently applied.

The Library of Congress has issued a pamphlet compiled under the direction of Herman H. B. Myer, chief bibliographer, on "The United States at War," giving references to the organizations directly and indirectly engaged, and to the literature on the subject, containing many references to commerce and transportation in war. It has also issued a bibliography of recent references on railroads in war. The library of the Bureau of Railway Economics also has available for distribution a special list of references on railroads in war which was originally issued on October 10, 1914, but which has been extended in mimeograph form to August 2, 1915. The bureau has also compiled a list of references relating to employment of women on railroads and street railways.

ELECTRICAL SUPPLIES FOR SWISS RAILWAYS.—In developing the plans for electrification, the government has created a special department, under the management of the Swiss Federal Railways, known as "Direktion für die Einführung der elektrischen Zugförderung der Schweizerischen Bundesbahnen, Berne, Switzerland." This department announces that it is prepared to consider proposals for sale and delivery of such electrical material as may be necessary for equipment in connection with this work, and that bids will be received from all countries. A statement by the management shows that large orders for copper wire already have been placed with certain firms in the United States, and that British and German firms are applying for details in order that they may submit offers.—*Commerce Report.*

FREIGHT CONGESTION IN RUSSIA.—The American Consul at Dairen cables June 6, 1917, as follows regarding shipping conditions in Russia: For Moscow and other cities shipments are long delayed at several places and cars are seldom available. All difficulties are confined to the Russian railroad, which is now taking only 300 tons of through goods daily, and from Dairen less than 120 tons, while there are several thousand tons here awaiting shipment. For through goods arrangements can be made to Harbin, Manchuria, only; for points beyond, arrangements are to be made at Harbin. Local forwarders can get goods through to Russian cities sporadically if the goods are here ready for instant shipment. Dairen is the best port for goods requiring trans-shipment, because there is no duty, insurance is low, storage in private godowns is cheap, and the facilities are superior to the chosen route. No parcel post packages for Russia have been accepted since May 29, and the embargo is indefinite.



View of the Building Before Completion from the Street Side

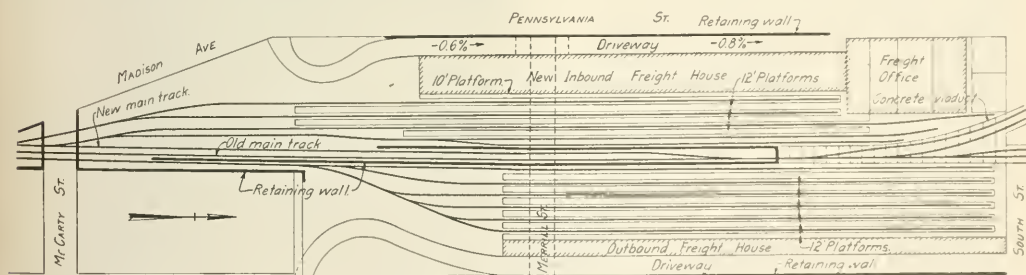
Pennsylvania Freight House at Indianapolis

New Inbound House and Tracks Are Being Built to Modern Standards. Several Interesting Details Developed

THE Pittsburgh, Cincinnati, Chicago & St. Louis is now completing a new inbound freight house layout at Indianapolis, Ind., which is of modern construction throughout. This structure and its tracks occupy all the land between South Pennsylvania street and the main tracks and extend from South street to McCarty street, with the exception of an area 250 ft. by 140 ft. at the corner of South and Pennsylvania streets. By agreement with the Board of Public Works of Indianapolis, dated August 19, 1912, all streets and alleys within this territory except Merrill street, were vacated, together with a strip 14 ft. in width

ing the driveway, freight house and tracks over this street on steel work. It also required the building of a retaining wall along Pennsylvania street.

This subway and retaining wall were constructed by railroad forces in 1913 in connection with the elevation of the main tracks and the outbound freight house layout. As this work required a number of construction tracks which could be reached from the elevated tracks, excavation for the inbound freight house was started and the material was used as fill. The lead to the ultimate freight house tracks was completed in 1914. The contract for the construction of



Map of the Freight House Layout

along the east side of Pennsylvania street extending 540 ft. north of the north line of Merrill street and a 9-ft. strip from Merrill street to Madison avenue.

It was the original intention to build the freight house on the grade of Pennsylvania street, but the city's plans for track elevation were then being prepared and a subway was required at Merrill street which would extend under the entire layouts for outbound freight, main track and inbound freight facilities. This was secured by depressing Merrill street about 8 ft., building the inbound freight house and tracks on an 0.8 per cent grade north of Merrill street and a 0.6 per cent grade south of Merrill street and carry-

ing the inbound freight house proper was awarded to the Wm. P. Junglaus Company, Indianapolis, Ind., on December 21, 1915.

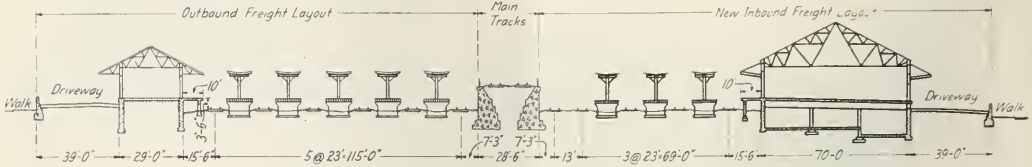
The general arrangement of the inbound layout is shown on the drawings. The driveway on the west side of the building extends the full length of the house and is 39 ft. in width, being reached from Pennsylvania street at the north end and from Madison avenue and Pennsylvania street at the south end where there is a curved approach 350 ft. long on a 3 per cent grade. The building is 790 ft. long and 70 ft. wide. A basement is provided for storage which is reached from the Merrill street subway, only

25 per cent of which is being finished at present, giving ample room for future development.

The first floor, which is on the track level, provides a large area for all freight handling. On the east side of the house is a 10-ft. platform protected from the weather by a shelter roof suspended from the side of the building. Five tracks and 3 island platforms, each 12 ft. wide, are covered

grade conforms to the grades of the tracks which are 0.6 per cent and 0.8 per cent, while across the building there is a fall of $\frac{1}{4}$ in. to 1 ft. All trucking is down grade from the cars to the teams or trucks.

The fender on the side of the building along the main driveway and also along the basement driveway consists of 8-in. channels, concreted in place and held by countersunk



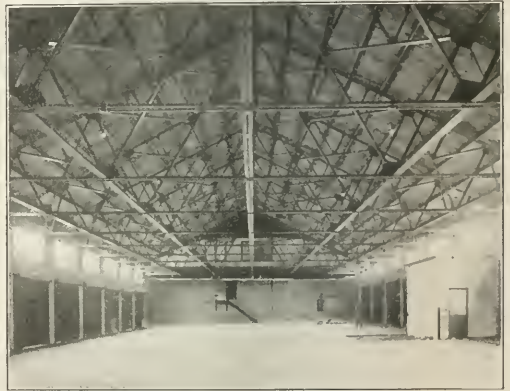
Cross Section of the Freight Terminal

with sheds of the butterfly type. On account of the track elevation work not yet being completed, only 3,010 lineal feet of platforms are now being built; this gives an unloading capacity of about 115 cars. This will be increased by about 20 cars when the elevation work is completed.

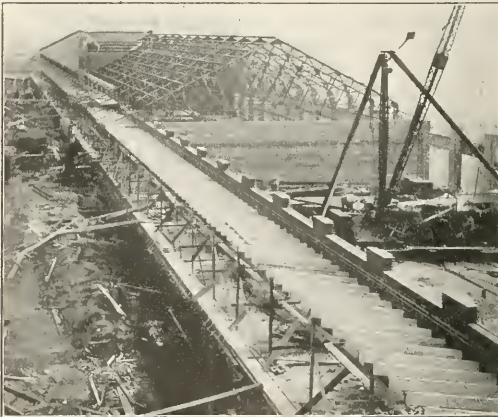
The building is divided into four sections by means of brick fire walls, all openings in which are equipped with metal fire doors; each section is provided with one 4-in. fire hydrant and 100 ft. of hose. A small room is provided in each section for freight checkers, while each section also has one set of beam scales and a hatchway for an elevator to the basement.

The offices in the second story are formed by means of a dormer in the center of the building, the floor being supported on the bottom chords of the roof trusses. The central fire wall divides this second floor into two parts, each of which is again divided by the use of hy-rib partitions, giving four good-sized rooms for the use of the freight

anchor bolts. The tops of these channels are level with the trucking floor, instead of 4 in. to 6 in. below as has been the general practice in the past. Along the trucking platform on the east side of the house, a metal groove, 1 in. wide and 1 in. deep, was placed about 20 in. from the edge



An Interior View of the House



A View During Construction

house foreman and his clerks and for records. These rooms are reached by steel stairs supported on brackets fastened to the fire wall. In the finished portion of the basement a large warming and locker room is located for the use of the freight handlers. A toilet room and a boiler room with coal and ash bins extend under the platform on the east side of the building.

One noticeable feature of the main floor of this building is that it is sloped in two directions. From end to end the

of the platform for the entire length of the building. This groove affords a place in which to hook the steel plates used to bridge over the gap between the cars and the platform.

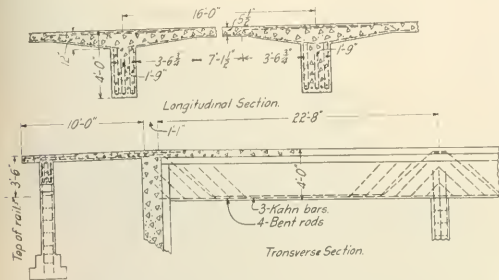
As mentioned above, the excavation for this building was begun by railroad forces and about one-third was completed, leaving almost 8,000 cu. yd. for the general contractor. This work of excavating and backfilling was handled entirely by teams and wagons, the material being used to fill for the driveway along the west side of the building and to backfill against the building.

The foundations for the inbound freight house were designed in conjunction with the Trussed Concrete Steel Company and consist of an 18-in. concrete wall with a reinforced floor slab supported on beams and columns. All footings were carried down to a sandy gravel capable of supporting four to six tons per square foot.

All bearing walls above the level of the first floor are of brick, the face brick being selected penny pavers with round corners. The backing brick are a common hard brick. All stone copings and chimney caps are of Portage red sandstone, all pieces of which were firmly anchored and embedded in mortar colored to match. Cement mortar was

used throughout in connection with hydrated lime and local sand, while Jamestown black coloring was used with the mortar on face brick.

The steel trusses rest on the brick walls and span the entire width of the building. These trusses are riveted together with channel purlins which serve as a base for



Details of the Freight House Floor

the reinforced cement tile roof. On the ends of these trusses are fastened tee-iron hangers which extend down to a 10-in. channel, forming the outer edge of the roof over the trucking platform. This roof is 10 ft. wide and is formed of 4-in. by 10-in. yellow pine rafters, 32 in. apart on centers, extending from the channels into the brick work. On these rafters is placed yellow pine sheathing 1 5/8 in. thick, beaded



The Track Side

on the under side, making it conform to the city building code for slow-burning wood construction.

The roof over the platform slopes from the outer edge toward the building, and consists of five-ply asbestos felt, made and applied by the H. W. Johns-Manville Company. The flashing against the building is secured by means of a tile raggle block into the recess of which the roofing is carried and sealed. As there is no conductor on the upper tile roof all water, snow and ice drops about 8 ft. onto this

roof, putting it to a severe test. The roof of the freight house is of reinforced, red cement tile, built in sections about 2 ft. by 4 ft. in size, made and applied by the Federal Cement Tile Company, Chicago. Built in with the platform roofing are lead sleeves with 3-in. flanges on top. These sleeves extend down through the roof into 4-in. wrought iron downspouts connecting to the sewers running along both sides of the house and draining into the sewers in Merrill street.

Kinnear type rolling steel doors are placed at all outside driveway and platform doors, these doorway openings being 10 ft. high and 12 ft. wide. Fenestra steel sash are used throughout. As the windows are placed above the overhang, they afford ample light during the day without the use of skylight glass in the tile roof.

The main floor of this building is of 1 1/8-in. maple, with a 2 1/2-in. surface, and end matched. This extends out on the east platform to within about 2 ft. of the edge and is laid on, and blind nailed to, wedge-shaped sleepers cut from



The Driveway and Street Doors

3-in. by 4-in. hemlock and creosoted. These sleepers were laid on the reinforced concrete slab, 16-in. apart on centers, brought to an even surface on top, concreted into place with a lean mixture of concrete, and run parallel with the length of the building, while the maple flooring is laid across the building rather than on the diagonal.

The scales, four sets in all, were made in the railway company's shops at Columbus, Ohio, and are suspended from the concrete beams supporting the floor, which leaves the space below available for trucking. These scales are similar to, and in fact some of the parts were purchased from Fairbanks, Morse & Company, and are of the beam type.

The checkers' rooms are of hollow tile construction with hollow tile roof slabs. One of these rooms, 8 ft. by 12 ft. inside, is located in the center of each section of the building. The outside of these offices is of a plain sand plaster finish, while the inside is finished in white. These checker rooms are located on the track side of the house, the east wall, one-half of which is window, replacing one door. Two 14-in. Reznor heaters of the wall type, supplied with artificial gas, provide ample heat.

Steel and cast iron jamb guards protect the brick work from injury from trucks. The flashing around the dormer windows, the chimney and against the office building at the north end consists of a double copper flashing, well cemented

into the brick work. The wood work and roof trusses throughout the building were given two coats of Pennsylvania light standard building paint made at the Columbus shops. The steel doors were given two coats of standard box car red paint, while the door jambs and the remaining steel work were painted black.

The electrical work in the basement consists of a conduit concealed in the floor slab of the first floor forming the basement ceiling, with outlet boxes and lamps suspended on steam and keyless socket fixtures. On the main floor the conduits are all carried on the bottom chords of the roof trusses and have 25-watt lights with Monax glass reflectors suspended from conduit outlet boxes, one light being provided for every 250 sq. ft. of floor. Key switches on the side walls control 8 lights, 4 on each of the two trusses.

One American Radiator Company's down draft steam heater of 1500 sq. ft. radiation is placed in the basement, furnishing steam heat for the toilet room, the freight handlers' room and the second floor offices, no attempt being made to heat the main floor.

The driveway along the west side of the building was laid on filled ground after it was thought to have been fully settled. This paving is of the monolithic brick type, having a full 6-in. concrete base on which the best grade of hard Martinsville knobstone brick were laid and grouted, allowance being made for expansion along both curbs and about every 30 ft. by the insertion across the driveway of a 1/4-in. strip of "Elastite." A separate contract was given to the American Construction Company of Indianapolis on August 16, 1916, for the grading, curbing, sewers and paving. Work was begun on August 28, and completed November 24.

The three island platforms of the inbound layout consist of concrete piers 10 ft. apart on centers on which 2-in. by 12-in. joists were laid parallel with the tracks, supporting an oak floor of 2-in. by 6-in. and 2-in. by 8-in. boards 16 ft. long, laid at an angle of about 53 deg. This trucking floor is 12 ft. wide, the edge being placed 5 ft. 6 in. from the center of the track and 3 ft. 6 in. above the top of the rail. A shelter shed of the butterfly type is constructed over these platforms using 8-in. by 8-in. posts 20 ft. between centers and set in the center of the platform. Three-inch wrought iron downspouts with Holt leaders, connections and rosettes are placed on every other post. A 4-ply built-up asbestos roof is used. The platforms are lighted by single rows of electric lights with attachments for portable lights that can be carried into cars. These platforms were not included in the original cost or contract for the freight house and separate bids were taken for their construction. The contract was awarded to the Cuthbert Bros. Company, Pittsburgh, on December 16, 1916. Work was started at once and is still in progress.

A three-story brick warehouse stood on the extreme north end of the property purchased for the freight house. It was decided not to wreck this building but to remodel it for an office building for all freight offices and clerks, both outbound and inbound. Separate bids were asked for on this work and a contract was made with the Wm. P. Jungclauss Company in November, 1916. Work was started at once and it was completed about the middle of March, 1917. The basement of the building will be used at present simply as a boiler room and coal room where a new steam heating plant is installed. The first floor contains the freight cashier's office with three windows to serve the public, a 12-ft. by 12-ft. vault, a stationery supply room, toilets, a hot and cold room, and rooms for bonded and astray freight.

The second floor is arranged for three small offices for the freight agent, the cashier and their clerks and is also the main office room in which are all the inbound and outbound clerks, the telephone exchange, the vault and the toilet rooms. A light well has been placed between the second

and third floors and a skylight in the roof. The third floor is at present unfurnished and is to be used for the storage of records. All finished walls and partitions are made of hy-rib metal lath and plaster and the interior windows and doors are fitted with crystalline glass. Provision is made in all rooms for electric lights, electric fans and telephones. It is also the intention to install a pneumatic carrier system connecting each billing booth of the outbound house, each receiving booth of the inbound house, the cashier's room and the freight house foreman's rooms with the central station located in the main office room adjacent to the telephone exchange. A 3-in. tube will be used for this purpose and an air compressor located in the basement.

All plans and specifications for this freight layout were made in the office of W. C. Cushing, chief engineer maintenance of way, Pittsburgh, Pa., J. D. Moffat, Jr., was the engineer in charge at Indianapolis.

DUPLEX LOCOMOTIVE STOKER

The Duplex locomotive stoker has recently been placed on the market by the Locomotive Stoker Company, Pittsburgh, Pa. This stoker is known as the Duplex type D and includes many features of the Street type C stoker. The new Duplex stoker has included in its construction a



Cab View of a Locomotive Equipped with the Duplex Stoker

crusher which will handle lump coal, reducing it to the proper size before delivering it to the firebox. This eliminates the necessity of preparing the coal before it is placed upon the tender. It will handle slack coal as well as lump. The stoker occupies little space in the cab and operates practically noiselessly. Like the Street stoker it does not occupy

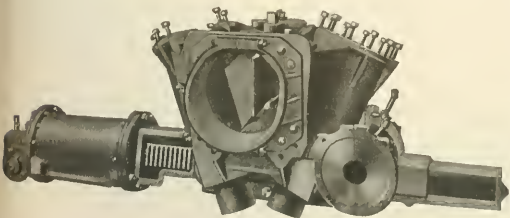
any of the grate area of the locomotive, nor does it obstruct the firedoor.

The Duplex type D stoker consists of a conveyor and crushing system, an elevating system and a distributing system, the entire mechanism being driven by a simple slow speed reversing engine. The coal travels through the stoker as follows: The shoveling sheet of the tender is provided with an opening 18 in. wide extending from the coal gates

The conveyor consists of a wrought steel trough in which is the cast steel screw and the crushing plate. The trough is supported under the shovel plate by two angles riveted on each side of the conveyor conduit, which forms bearings for rollers fitted on the arms of the conveyor slide support. This support is permanently secured to the bottom of the trough about 3 ft. from its rear end, thus providing flexibility to take care of the movement between the engine and tender. The lower angle bearings extend almost to the front of the tender and form a track on which the trough rolls when being removed from the tender. The conveyor unit moves with the engine, merely resting on the angle bearings in the tender, but when the engine and tender are parted it can be uncoupled from the transfer hopper and left with the tender. An angle ring fits into and around the top of the trough, preventing dust from blowing into the tender tank and coal from rolling over the sides of the trough.

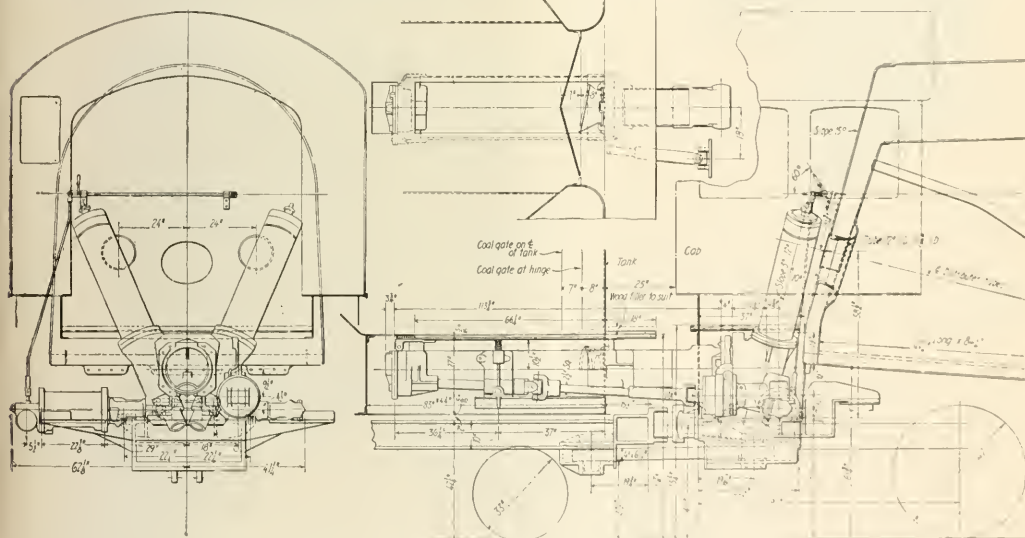
The crusher is at the front end of the opening in the tender deck, and consists of a heavy plate with projections set in a slide in the trough. The smaller sizes of coal are carried through without crushing or breaking, but the larger lumps are forced against the crusher plate by the conveyor screws and are broken to the proper size for efficient firing, and go on to the transfer hopper. The conveyor is flexibly attached to the hopper by means of a ball joint permanently riveted to the trough and fitting into clamps bolted to the back of the transfer hopper.

The transfer hopper is a large casting secured to the engine frame beneath the cab deck. Secured to the front on a pivot inside the hopper, and dividing the coal coming through the front trough opening, is a dividing rib which



Transfer Hopper and Steam Engine of the Duplex Locomotive Stoker Showing the Vane for Distributing the Coal to the Vertical Screws

to the slope sheet. The opening is covered by slides, each measuring about 20 in. in length. After passing through this opening to the trough beneath, the coal is conveyed by the conveyor screw to the crusher, where it is forced against the crusher plate by the screw and broken to a suitable size. The coal then passes to the transfer hopper, where it is di-



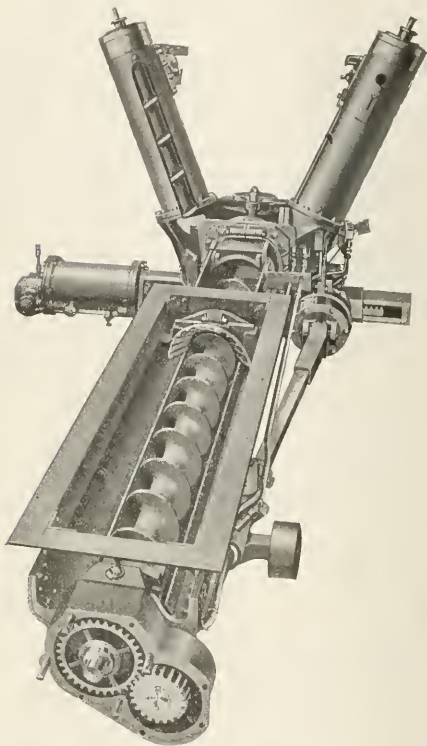
The Duplex Stoker as Applied to a Locomotive

vided equally or unequally according to the position of the adjustable dividing rib between the two elevators. In the elevator casings are screws which raise the coal and allow it to drop into tubes which are fitted into elbows and extend through holes in the backhead on each side of the firedoor. Constant steam jets in the elbows blow the coal through the tubes and distributors located on the inside of the firebox deflect and spread the coal over the entire surface of the fire.

can be operated through an opening in the cab deck. By turning this rib to the left or right the supply of coal to either of the vertical elevators may be controlled.

The spreading of the coal in the firebox is accomplished by means of the two firing points at the openings through the backhead of the boiler. The firedoor is left undisturbed so that it can be used for hand firing at the roundhouse and on sidings or when drifting. Two elbows, in which the firing nozzles are secured, are bolted to the elevator casing.

Distributors and tubes combined are attached to these elbows, the tubes extending through the openings in the backhead and the distributor, being on the inside of the firebox. The distributor tubes serve as a firing plate and the coal



Exposed View of the Duplex Locomotive Stoker Detached from the Locomotive

is blown through the tubes on to the underside of the distributor by jets of steam admitted to the firing nozzle. An intermittent action is secured through a constant steam jet

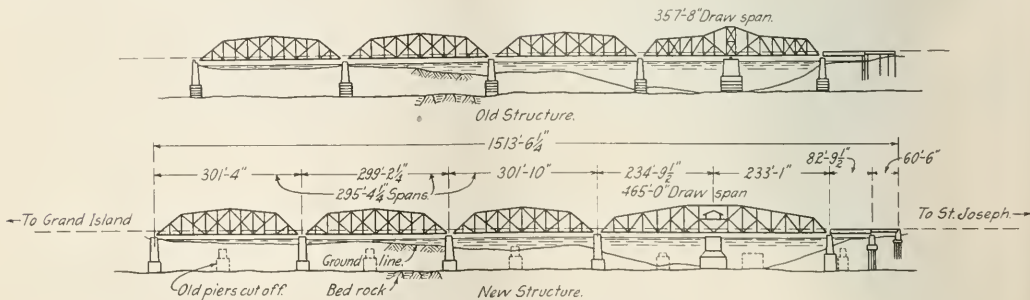
The driving engine consists of a cylinder of 11-in. bore with a $17\frac{3}{4}$ -in. stroke, being provided with a hollow piston rod and a reverse head. It operates on from 8 to 80 lb. of steam according to the load. In normal operation the piston has a power stroke in one direction only, namely, when the piston is traveling towards the center line of the locomotive. The stroke is cushioned at either end by steam. It is so controlled that it may be stopped and reversed at any point of the stroke by moving the operating rod located on the back head of the boiler. A horizontal and vertical rack which meshes with pinions operating the conveyor mechanism and the vertical elevators, respectively, is connected directly to the piston. The inner cylinder head is cast integral with the housing which carries these racks. The conveyor driving shaft is provided with a universal joint and a slip joint to permit the necessary motion between the engine and tender. The operation of this shaft is controlled through three sets of pawls and a ratchet. In normal operation the horizontal rack driving the pinion operates the conveyor shaft in one direction only; on the reverse movement the pawls slide over the teeth in the ratchet wheel. There are three operations which are controlled by a shifter lever. The first is the drive, or normal operation, the second is neutral, and the third is the reverse operation. Thus the conveyor may be operated in either direction or may not be operated at all while the stoker engine is running. The vertical elevator screws are operated in similar manner. They have a bearing in the bottom of the transfer hopper and in the top of the elevator casing.

The pressure of steam on the steam jet under working conditions varies from 10 to 25 lb. The distribution is regulated by varying the pressure, which is indicated by a steam gage on the backhead of the boiler, and also by changing the position of the dividing rib. The amount of coal fed can be regulated by varying the speed of the engine. Stokers of this type have been operating successfully for several months and a large number have already been ordered for application to locomotives now under construction.

RECONSTRUCTION OF THE ST. JOSEPH BRIDGE

The bridge of the St. Joseph and Grand Island, over the Missouri River at St. Joseph, Mo., is being reconstructed to provide a new substructure and a new draw span. The present bridge is a single track structure with highways supported on brackets outside of the trusses on each side.

The piers of the existing structure were built in 1872 and the superstructure was renewed on these same piers in 1904. It now develops that the substructure must be re-



Elevation of the New and Old Bridges

and the stopping of coal elevation during the return stroke of the driving engine. Peep holes are provided through which the coal supply and the condition of the fire can be observed.

newed and, as a condition for granting authority for the reconstruction, the War Department of the United States Government insisted upon a longer drawspan, giving a clear channel opening of 200 ft. on each side. This necessitates a

new drawspan of greater length and the shifting of the fixed spans to make room for it.

The erection program is briefly as follows: A 70-ft. plate girder span will be modified to operate as a temporary bascule bridge between old pier 3 and new pier 2. When this has been installed underneath the existing drawbridge, the western portion of the old drawbridge steel will be removed and the temporary bascule raised and placed in operation, highway traffic during the reconstruction being carried on the railway track. The new drawbridge will be erected parallel with the stream, being cantilevered each way and the balance being maintained by temporary steel pile bents.

A temporary trestle will be constructed under the three fixed spans which will be supported on jacks resting on standard railway trucks. When the necessary work has been completed the three fixed spans will be rolled about 136 ft. to the west, the temporary bascule dropped, the east half of the old drawbridge moved down stream on temporary supports opposite the piers, and the new drawbridge swung into place. After this, the remaining portion of the old drawbridge will be removed.

The contract for the new substructure has been let to the Missouri Valley Bridge & Iron Company, Leavenworth, Kan., and work has already started. The substructure piers are being installed by the pneumatic-caisson process. The contract for the fabrication of the new drawbridge steel has been let to the American Bridge Company but the contract for its erection has not been awarded although bids have been asked and it is expected that the contract will be let in the near future.

It is expected that the substructure will be completed in the early fall and the entire reconstruction finished early in 1918.

STATE OWNERSHIP FAILS IN SOUTH AMERICA

All the larger republics of South America at some time have tried government ownership of railways. Most of them have abandoned the policy as a failure. Why, is shown in an illuminating analysis of South American railways by Lionel Wiener, now appearing in the *Railway Gazette* of London, which is summarized as follows by the Bureau of Railway News and Statistics.

"One and all have shown the same results, owing mainly to the creeping in of politics in their management; too many employees that it has been deemed unadvisable to discharge; bad service and rolling stock that careless management has allowed to decay; construction of expensive unnecessary lines; costly exploitation, yielding an annual deficit."

Probably no quarter of the world so well as South America enables close comparison between state and private operation under similar conditions, sometimes the comparison being possible on one and the same railway. The Sobral Railway of Brazil, opened by the government in 1883, operated at a steady deficit up to October 31, 1897, when it was taken over by a private company. From the date of the transfer it has shown a handsome profit, the constant deficit having been turned to a profit even in the two months of 1897 remaining after the transfer. The Porto Alegre Railway of Brazil was operated by the government from 1883 to 1891 at a deficit. It was then taken over by a company which by 1904 had reduced the working percentage to 75.42 per cent.

Today the Central of Brazil is the principal Brazilian railway under government operation. For every \$100 of its revenues the expense of operation of this line rose from \$96.70 in 1907 to \$136.90 in 1911, dropping to \$126.20 in 1912. In 1908, while this government railway was spending \$105.50 to earn \$100 gross revenues, the three neighboring private railways spent respectively \$45.90, \$54.20 and \$56.30

for each \$100 revenue. The army of unnecessary employees is blamed for the state railway's persistent and growing deficits. "Such a system as the Central of Brazil is an excellent electioneering instrument in the hands of government," says the author, "and despite the annual deficit, not likely to be relinquished."

Chili has had a similar experience. Operating expenses of the Chilean State Railways rose from \$50 for each \$100 revenues in 1884 to \$164 for each \$100 revenues in 1907, dropping then to \$123 in 1911. Between the same years the Paulista Railway, the leading private company, increased its expenditures from \$41 to \$44 for each \$100 revenues, in one year reaching \$60, the highest attained, and in two other years falling to \$31. In 1907 and 1910 the Chilean state system contrasted as follows with the private railways in the amount spent for each \$100 gross revenues:

	1910	1907
State Railways	\$121	\$163
Tacna Arica	60	68
Iquique	47	47
Antofagasta	67	64
Taltal	54	61
Curanilahue	55	55
Paulista	45	41

Peru's record is even worse. After starting a number of costly lines the government defaulted and handed the system over for operation by the Peruvian Corporation.

Argentina, the only other South American country retaining any considerable mileage under government operation, contemplates leasing the greater portion to a private company. The northern lines cover 3,129 miles of the entire 3,482 miles government operated. A great portion of the country served is rich in sugar, maize, wine, etc., and "economically worked, there is little doubt these systems should yield fair returns. Yet their deficit has been almost continuous, which contrasts strongly with most other lines. Proposals for leasing them have been put forward and the adoption of some such step would be eminently sound."

Individual provinces of Argentina have had identical experiences. Of three provinces which have tried government ownership, two abandoned the system after a few years of deficits and handed the lines over to private companies.

DOMINICAN CENTRAL RAISES FREIGHT RATES.—The Dominican Central Railroad, which connects Puerto Plata with Santiago, a distance of 42 miles, with an extension to Moca of a further 17 miles, has raised its freight rates, effective June 18, from 10 to 25 per cent. The management has given as a reason for the increased freight rates the high cost of coal and other materials required by the railroad company.

AUSTRALIAN RAILWAY FINANCE.—It has been found necessary by the Victorian Government to engage the services of an English expert to investigate the cause of the unfavorable financial condition into which the railways of that state have lapsed. The operations of the New South Wales railways each year, for the past five years, have shown a more alarming set-back, with indications of a greater deficiency in the near future, although the traffic has been above all previous records. The results have been as follows: For the year 1911 810,948,779 ton-miles of freight and 11,915,500 passengers were carried, which realized on the railway transactions a surplus of £553,998 (\$2,692,430). This traffic increased year by year until, by the year 1916, it had reached a total of 1,028,760,504 ton-miles of freight, and 13,941,210 passengers, equivalent to an all-round increase of over 25 per cent, yet a loss of £777,747 (\$3,779,850) resulted, compared with the operations of 1911. During this period capital expenditure was increased by £17,853,698 (\$80,768,972) and £1,500,275 (\$7,291,337) extra was paid in wages—for operating the traffic—for the year 1916 to that paid in 1911.

General News Department

The American Association of Demurrage Officers has decided to hold no convention this year.

The Illinois Central has granted an increase in pay of seven per cent to its clerical employees, effective July 1.

The Missouri Pacific has granted an increase of five cents an hour to members of the shop crafts employed on the road.

The list of roads which reported subscriptions of Liberty Bonds to the Liberty Loan Committee of Railroads, as noted in last week's issue, did not include the name of the Evansville & Indianapolis. On that road 74 individuals subscribed for \$5,750 in bonds.

Edward Chambers, vice-president of the Atchison, Topeka & Santa Fe, in charge of traffic, has been appointed an assistant to H. C. Hoover, food administrator at Washington, and will act in an advisory capacity with reference to transportation matters in connection with the campaign for food conservation.

The New York, New Haven & Hartford, which has taken off 199 passenger trains, is thereby saving, each week, 2,054 tons of coal, equal to an annual saving of 106,828 tons. As two tons of coal will warm a family of five persons a long time, it is estimated that by reason of this economy of train service nearly 270,000 persons could be kept comfortable during the coming winter.

The acute shortage of freight cars has caused the Tennant-Oakland Automobile Company, Pontiac, Mich., to organize the Tennant-Oakland Transportation Company, to provide adequate means of fulfilling delivery contracts, and to supply the demand for Oakland automobiles in Chicago. The company has bought 40 freight cars, which are now being used between the factory at Pontiac and the branch in Chicago.

The Lehigh Valley on postcards mailed to consignees advising them of the arrival of freight, prints on the address side of the card in red type the following: "These are war times. We are doing everything in our power to handle the country's business. You can do your bit by moving the freight referred to in this notice just as soon as possible." Agents will supplement these notices with personal appeals whenever possible.

As the result of a movement instituted by employees of the Chicago Great Western, \$1,640 was recently collected and sent to the Great Western company of the Third Reserve Engineers, now stationed in Chicago, to provide greater comforts for the men. R. B. Parrott, passenger conductor, was chairman of the employees' committee which handled the contributions, and George Bristow, assistant general passenger agent, Chicago, was secretary.

The Chicago Car Interchange Committee has opened an office in the Transportation building, Chicago, with D. I. Forsyth, general car accountant of the Wabash, in charge. The committee is one of a number of bureaus which have been organized in all the large traffic centers of the country to assist the Commission on Car Service of the American Railway Association in bringing about the greatest transportation efficiency possible on the part of both the railroads and shippers.

The University of Louisville (Ky.) announces the opening, July 20, of a school for training telegraph operators for the Government Signal Corps. The Louisville & Nashville Railroad joins with the university in furnishing the equipment, and the school has been established at the request of the War Department. Candidates must be men between 18 and 31 years of age, and they must have no dependents. Women may attend the school for the purpose of preparing themselves to take the place of men who may be called into the national service.

Henry J. Horn, formerly vice-president of the New York, New Haven & Hartford, is one of the 12 members of the Red Cross Commission now on its way to Russia. The commission is carrying with it a quantity of urgently needed supplies and

surgical instruments, and will study conditions so as to ascertain how the American Red Cross can extend most effective relief. In co-operation with the American Railroad Commission already in Russia, the Red Cross Commission will study the problem of transportation, especially with reference to making sure that shipments of relief supplies may reach their destination without delay.

Committee meetings of the American Association of Railroad Superintendents were held at the Hotel Sherman, Chicago, on July 1 and 2. The Committee on Arrangements considered the matter of charges for spotting cars on private sidetracks. The Committee on Membership considered the following subjects: Elimination of overs and shorts; how to develop a more wholesome feeling of the public towards the railroads; and yard operation. The Arbitration Committee discussed the following subjects: How to get a better feeling from the public, thereby obtaining their assistance in loading and releasing equipment; handling of live stock to comply with federal law; railroad and highway grade crossing protection; and the inadvisability of handling carload freight on card billing.

Special Agents Convention Postponed

The International Association of Railway Special Agents and Police, which was to have held its annual convention at Omaha, Neb., on June 25, 26 and 27, did not convene on account of the war emergency. The annual meeting of the American Association of Freight Agents, scheduled to take place at Denver, Colo., on June 19, 20, 21 and 22, was also indefinitely postponed on account of the war.

United Railways of Yucatan

These lines are now a part of the Mexican Government railways, the government having acquired all of the stock of the company.

These railways were some time ago taken over by the government of the state of Yucatan from their private owners, and the name changed to the Constitutionalist Railways of Yucatan. The owners of the property are quoted as saying that they were practically forced to sell their stock to the Federal government. This system of railways covers not only the Peninsula of Yucatan, but extends also to the city of Campeche in the state of that name. It has a total length of about 530 miles.

New Santa Fe Bonus

E. P. Ripley, president of the Atchison, Topeka & Santa Fe, announced on July 1, that employees in the service of the road on December 31, 1917, will be paid an additional compensation equal to 10 per cent of their salary or wages for the second six months of the calendar year. The following employees are excepted: Those working under schedules or contracts made by collective bargaining, those whose pay equals or exceeds \$5,000 per annum, or whose total compensation for the six months in question is over \$2,500; those whose rate has been increased or who are employed during the six months' period, with the understanding that the additional payments will not be made to them.

Sir John A. F. Aspinall

John Audley Frederick Aspinall, general manager of the Lancashire & Yorkshire, is now a knight, that honor having been conferred on him by King George on his last birthday. Mr. Aspinall is a member of the Railway Executive Committee now managing the railways under the war regime. He was born in 1851. He was educated at Beaumont college, Berkshire, and his first railway service was in the shops of the London & Northwestern at Crewe. From 1875 to 1886 he was a shop superintendent on the Great Southern & Western of Ireland. In the last named year he went to the Lancashire & Yorkshire as chief mechanical engineer and he has been with that company ever since. The ex-

tensive shops of that company, at Horwich, were laid out under his supervision. He was appointed general manager in 1899. In 1907 he was chairman of the general manager's conference at the Railway Clearing House, and in 1909-1910 he was president of the Institution of Mechanical Engineers.

Prompt Release of Cars

At the Steelton plant of the Bethlehem Steel Company, Steelton, Pa., in the month of June, 7,690 loaded cars were received from the Pennsylvania and the Philadelphia & Reading railroads, and almost one-half of them were on the tracks of the Steel company less than 24 hours each. This company's demurrage bills are paid under the average agreement, and the record for June shows a surplus of 822 credits. There were no non-cancelable debits. The number of cars unloaded and returned within one day was 3,719. The cars are taken by the engines of the Steel company outside the plant, and these engines do all the spotting. The plant is about $3\frac{1}{2}$ miles long.

The Mexican Railway

This railroad, which is a British-owned property, is to be rehabilitated and placed in full control of the operating company, according to the announcement of B. E. Holloway, of London, England, who has just arrived in the City of Mexico. Mr. Holloway is director general of the railroad, and he has come to Mexico with full authority to act for the stockholders. The road extends from the capital to Vera Cruz, a distance of 264 miles, and has several branch lines with an aggregate length of about 185 miles. Mr. Holloway has held the position of secretary of the company, with headquarters in London, for several years, and his appointment as director general is expected to be followed by his removal to the City of Mexico. This road has suffered heavy damages at the hands of revolutionists and bandits during the last six years, and a large claim for losses has been presented to the government. Some time ago the property was taken over by the Carranza authorities, and it is still operated by the government, with Pauline Fontes as general manager. It is understood that as soon as the road is turned back to its owners, Walter Morcom will resume his former position as general manager. Long stretches of track and many bridges will have to be rebuilt. The rolling stock has also been greatly depleted during the long revolutionary period. The English-built sleeping cars that the line owned and operated are now scattered all over Mexico, a number of them being used as private movable homes of army officers.

I. C. C. Establishes Division on Car Service

The Interstate Commerce Commission announced on Thursday the creation of a division on car service to administer the authority over matters pertaining to car service given to the commission by the Esch-Pomerene law, which was passed by Congress in May. E. H. De Groot, Jr., formerly superintendent of transportation of the Chicago & Eastern Illinois, who will work in the exclusive employ of the Interstate Commerce Commission is to be the chief of the division. With August G. Gutheim, the examiner of the commission, who has been representing the commission in co-operation with the Commission on Car Service, he will take immediate charge of its organization and operation. H. C. Barlow, traffic director of the Chicago Association of Commerce and chairman of the executive committee of the National Industrial Traffic League, will collaborate with the division during its formative period. Chairman Hall, of the Interstate Commerce Commission held a conference with the Commission on Car Service on Wednesday and outlined to them the plans of the commission. The Interstate Commerce Commission has also announced that through the new division it will regulate car service and where occasion requires will issue orders to carriers, but that it will as far as practicable avail itself of co-operative efforts on the part of the railway committee.

The Esch-Pomerene law extends the jurisdiction of the commission over the movement, distribution, exchange, interchange and return of cars, requires the carriers to establish, observe and enforce just and reasonable rules, regulations and practices with respect to car service and the commission is empowered in its discretion to require them to file these rules and regulations in the same manner that tariffs are filed. The commission is also empowered to establish car service rules and, whenever it shall be of the opinion that necessity exists for immediate action, is

given emergency powers to suspend existing rules and to make such just and reasonable directions with respect to car service as it deems in the public interest. The law provides that the directions of the commission as to car service may be made through and by such agents or agencies as the commission shall designate and appoint for that purpose and penalties are provided for non-compliance.

Mr. De Groot was born March 22, 1871, at Galesburg, Ill., and has been in railroad service since May 13, 1886, beginning as office boy in the general freight department of the Chicago, Burlington & Quincy. After holding various positions in the office, train and yard service of the Burlington and the Chicago & Eastern Illinois, he became trainmaster of the latter road in 1902, and has since been successively division superintendent, superintendent and track supervisor, superintendent of the St. Louis division and terminals, and since November 16, 1912, superintendent of transportation of the Chicago & Eastern Illinois at Chicago.

Wires May Be Commandeered

The long pending controversy between the Louisville & Nashville Railroad and the Western Union Telegraph Company, in which the railroad seeks to compel the telegraph company to take its poles off the railroad right of way, was the subject of hearings before the Federal Court at Louisville, Ky., last week. The telegraph company presents evidence to show that the construction of new lines in the state of Alabama—the lines within that state are the ones which are now the subject of controversy—would require a long time, and also that the destruction of the existing poles and wires at this time would seriously interfere with the operations of the government on the Gulf Coast. There is a large volume of government messages to and from Mobile and Pensacola. The railroad company, on the other hand, produces affidavits to show that the telegraph business could be conducted with satisfaction to the government without using the wires along the Louisville & Nashville.

Attorney-General Gregory has written a letter to the judge of the court intimating that the government will not put up with any interruption of service, and it is understood that if there should be a prospect of disturbance of the regular currents of telegraph traffic, the government would seize the lines.

The lawyers for the Western Union asked the court to appoint a commissioner to determine how long the telegraph company could occupy the railroad premises, and what compensation should be paid to the railroad company.

The judge reserved decision and intimated that his opinion would not be handed down until September.

Trolley Car Accidents

In the derailment of a southbound passenger car on the Niagara Gorge Railroad, near Suspension Bridge, N. Y., on the afternoon of July 1, ten passengers and one employee were killed, and 26 persons were injured. A number of the victims fell into the Niagara river, and it is supposed that some were carried down stream and lost. The cause of the derailment was a weakening of the road bed. The car was moving at the rate of about 20 miles an hour.

In a butting collision of trolley cars near Monongahela, Pa., on July 2, making a bad wreck, which was run into within a few minutes by a work car, about 80 persons were injured, four of them fatally.

At Manistee, Mich., on the 4th of July, two persons were killed and 20 were injured, four of the latter fatally, when a street car was run into at a crossing by an excursion passenger train of the Manistee & North Eastern. It is said that the street car approached the crossing at uncontrollable speed, on a descending grade, having attached to it two heavy steel trailers.

In a butting collision of electric cars near Heisley, Ohio, on the 5th of July, eight passengers and a motorman were injured.

Near Youngstown, Ohio, on the 5th, a trolley car was derailed because, it is said, the brakes failed, and one passenger was killed and 20 injured. The wreck caught fire, and some of the passengers were rescued from the flames with difficulty.

At Stryker, Ohio, on the 5th, a rear collision of interurban cars resulted in the injury of 14 persons.

Near Michigan City, Ind., on the evening of the 4th, a trolley car, which was running at high speed, left the tracks on a curve and was overturned. Twenty persons were injured.

REVENUES AND EXPENSES OF RAILWAYS

FOUR MONTHS OF CALENDAR YEAR, 1917

Average mileage operated per period	Name of road	Operating revenues			Maintenance of way and equipment			Operating expenses			Net railway operating income (or loss)	Increase comp. with last year
		Freight	Passenger	Total	Structures	Way and equipment	Total	General	Miscellaneous	Trans-shipment		
		(Inc. misc.)	(Inc. misc.)	(Inc. misc.)	(Inc. misc.)	(Inc. misc.)	(Inc. misc.)	(Inc. misc.)	(Inc. misc.)	(Inc. misc.)	(Inc. misc.)	(Inc. misc.)
177	Kanawha & Michigan	\$827,511	\$116,653	\$944,164	\$297,505	\$181,813	\$479,318	\$29,272	\$796,586	\$181,813	\$68,000	\$117,634
466	Kansas City, Mexico & Orient	34,338	430,489	464,827	81,375	98,024	179,400	18,250	439,644	98,024	20,500	20,500
177	Kansas City, Mexico & Orient	34,338	430,489	464,827	81,375	98,024	179,400	18,250	439,644	98,024	20,500	20,500
846	Kansas City, Mexico & Orient	34,338	430,489	464,827	81,375	98,024	179,400	18,250	439,644	98,024	20,500	20,500
24	Kansas City Terminal Co.	372,690	28,525	401,215	51,881	53,362	105,243	15,750	251,694	53,362	232,219	1,466,879
900	Lake Erie & Western	209,253	2,605,437	2,814,690	424,833	52,352	477,185	59,425	1,832,477	477,185	107,000	665,696
97	Lehigh & Hudson River	14,905	70,652	85,557	11,139	11,139	22,278	17,919	477,928	22,278	202,323	19,409
296	Lehigh Valley	1,000,349	1,371,769	2,372,118	285,450	323,471	608,921	165,134	1,267,247	323,471	224,724	22,400
1,397	Long Island	1,340,439	2,330,978	3,671,417	623,698	565,087	1,188,785	363,197	2,447,209	565,087	655,000	2,045,501
1,052	Los Angeles & Salt Lake	256,645	994,301	1,250,946	608,215	131,278	739,493	166,464	1,164,649	131,278	213,984	1,196,669
302	Louisiana	362,223	69,501	431,724	88,070	82,214	170,284	17,396	349,936	88,070	40,253	38,567
342	Louisiana Ry. & Navigation Co.	386,023	100,146	486,169	107,222	73,425	180,647	165,134	1,267,247	73,425	24,724	70,813
1,862	Louisville & Nashville	1,023,653	4,603,439	5,627,092	1,353,201	1,353,201	2,706,402	363,197	2,447,209	1,353,201	294,183	1,415,615
5,070	Louisville & Nashville	1,023,653	4,603,439	5,627,092	1,353,201	1,353,201	2,706,402	363,197	2,447,209	1,353,201	294,183	1,415,615
200	Maine Central	498,616	987,946	1,486,562	91,472	70,575	162,047	19,597	1,294,889	91,472	16,200	24,231
1,862	Maine Central	498,616	987,946	1,486,562	91,472	70,575	162,047	19,597	1,294,889	91,472	16,200	24,231
126	Midland Valley	375,913	111,492	487,405	70,575	70,575	141,150	11,902	372,263	70,575	23,834	75,618
1,647	Minneapolis & St. Louis	6,998,341	554,105	7,552,446	1,504,924	179,045	1,683,969	87,804	2,403,232	1,504,924	173,902	1,191,846
4,228	Minneapolis & St. Louis	6,998,341	554,105	7,552,446	1,504,924	179,045	1,683,969	87,804	2,403,232	1,504,924	173,902	1,191,846
365	Missouri, Kansas & Texas	310,769	122,561	433,330	82,093	65,072	147,165	11,902	372,263	82,093	23,834	75,618
3,851	Missouri, Kansas & Texas	310,769	122,561	433,330	82,093	65,072	147,165	11,902	372,263	82,093	23,834	75,618
3,851	Missouri, Kansas & Texas	310,769	122,561	433,330	82,093	65,072	147,165	11,902	372,263	82,093	23,834	75,618
134	Missouri, Oklahoma & Gulf of Texas	90,912	1,417	92,329	13,133	9,978	23,111	7,059	80,263	13,133	735	15,256
3,756	Missouri Pacific	1,553,552	11,010,274	12,563,826	1,697,332	1,853,770	3,551,102	253,639	8,350,061	1,697,332	513,228	2,141,926
1,160	Mobile & Ohio	3,502,646	462,496	3,965,142	477,511	15,315	492,826	125,662	3,156,621	477,511	180,633	867,315
108	Monongahela	615,421	43,574	658,995	67,334	120,002	187,336	15,806	545,607	67,334	14,448	106,536
407	Monongahela Connecting	3,257,437	435,301	3,692,738	222,443	477,139	699,582	50,785	1,294,889	222,443	113,205	64,436
1,237	Nashville, Chattanooga & St. Louis	3,257,437	435,301	3,692,738	222,443	477,139	699,582	50,785	1,294,889	222,443	113,205	64,436
165	New Orleans	671,737	50,590	722,327	60,034	4,037	64,071	14,147	303,519	60,034	32,000	404,798
204	New Orleans & North Eastern	1,150,013	205,119	1,355,132	147,668	15,315	162,983	25,722	1,187,410	147,668	16,665	23,709
191	New Orleans Great Northern	333,101	89,754	422,855	40,053	71,690	111,743	27,956	314,540	40,053	5,600	119,846
6,083	New York Central & Mexico	4,285,466	16,371,294	20,656,760	7,111,931	13,290,765	20,402,696	1,071,342	17,400,548	7,111,931	3,602,838	12,395,643
5,770	New York Central & Mexico	4,285,466	16,371,294	20,656,760	7,111,931	13,290,765	20,402,696	1,071,342	17,400,548	7,111,931	3,602,838	12,395,643
1,997	New York, New Haven & Hartford	9,694,465	3,951,553	13,646,018	833,116	183,342	1,016,458	128,930	4,552,779	833,116	200,000	708,425
568	New York, Ontario & Western	1,817,574	1,101,248	2,918,822	240,006	230,491	470,497	18,693	752,249	240,006	1,850,900	58,966
112	New York, Philadelphia & Norfolk	806,396	191,727	998,123	116,116	94,609	210,725	23,638	1,294,889	116,116	54,000	200,900
2,085	Norfolk & Western	1,146,843	1,800,195	2,947,038	366,643	331,374	698,017	365,448	1,193,912	366,643	64,667	151,953
2,085	Norfolk & Western	1,146,843	1,800,195	2,947,038	366,643	331,374	698,017	365,448	1,193,912	366,643	64,667	151,953
6,519	Northwestern Pacific	19,551,349	4,222,332	23,773,681	3,620,072	3,446,073	7,066,145	491,005	13,083,517	3,620,072	960,000	6,924,125
307	Northwestern Pacific	19,551,349	4,222,332	23,773,681	3,620,072	3,446,073	7,066,145	491,005	13,083,517	3,620,072	960,000	6,924,125
2,307	Oregon Short Line	1,577,708	819,185	2,396,893	97,329	105,727	203,056	30,484	1,733,373	97,329	17,722	17,722
2,085	Oregon Short Line	1,577,708	819,185	2,396,893	97,329	105,727	203,056	30,484	1,733,373	97,329	17,722	17,722
670	Panhandle & Santa Fe	1,690,016	1,450,044	3,140,060	338,590	376,383	714,973	80,444	1,733,373	338,590	60,000	60,000
1,255	Pennsylvania Company	15,416,933	1,038,515	16,455,448	2,035,536	4,506,290	6,541,826	2,070,219	62,762,370	2,035,536	15,388,560	3,276,250
4,351	Pennsylvania Company	15,416,933	1,038,515	16,455,448	2,035,536	4,506,290	6,541,826	2,070,219	62,762,370	2,035,536	15,388,560	3,276,250
19	Pera & Pakin Union	56,659	23,941	80,600	10,453	5,442	15,895	1,531	364,997	10,453	31,500	59,989
1,127	Pera Marquette	2,278,448	20,603,632	22,882,080	3,597,572	186,254	3,783,826	340,517	14,151,118	3,597,572	582,920	5,945,353
718	Philadelphia, Baltimore & Washington	4,421,339	3,868,622	8,289,961	1,270,404	1,901,605	3,171,009	1,901,605	7,336,314	1,270,404	330,800	1,233,769
2,307	Pittsburgh & Lake Erie	1,646,956	2,268,935	3,915,891	583,411	995,015	1,578,426	570,809	1,805,629	583,411	909,549	1,780,422
209	Pittsburgh, Shawmut & Northern	404,346	22,129	426,475	437,385	53,812	491,197	1,514	474,178	437,385	7,176	43,969
281	Port Reading	508,909	386,199	895,108	306,653	42,537	348,190	1,960	444,579	306,653	14,620	15,601
88	Richmond, Fredericksburg & Potomac	374,479	389,392	763,871	126,012	15,955	141,967	34,267	665,333	126,012	48,000	58,902
488	Rutland & Grand Island	522,601	94,918	617,519	246,614	88,534	335,148	19,673	64,887	246,614	35,319	58,902
540	St. Louis, Brownsville & Mexico	777,018	517,865	1,294,883	197,240	15,096	212,336	43,354	833,203	197,240	557,067	404,264
3,539	St. Louis, Iron Mountain & Southern	9,764,288	2,610,324	12,374,612	1,950,344	2,190,441	4,140,785	266,119	8,728,123	1,950,344	627,291	1,854,079
4,752	St. Louis, Merchants' Bridge Terminal	11,245,607	2,399,777	13,645,384	1,484,384	54,424	1,538,808	266,119	12,274,766	1,484,384	30,255	209,489
1,127	St. Louis-San Francisco	1,245,607	99,749	1,345,356	251,031	7,871	258,902	29,536	1,142,321	251,031	45,087	43,449
943	St. Louis-Southwestern	2,972,007	321,102	3,293,109	312,692	603,725	916,417	108,704	2,035,812	312,692	136,186	1,905,296
811	St. Louis-Southwestern of Texas	1,186,921	311,840	1,498,761	162,515	56,108	218,623	79,965	1,556,808	162,515	72,652	117,301

* Reorganized on April 1, 1917. No cumulative figures shown.

REVENUES AND EXPENSES OF RAILWAYS

FOUR MONTHS OF CALENDAR YEAR, 1917—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues—				Maintenance of—				Operating expenses—				Net railway operating income (or loss).	Increase comp. with last year.
		Freight.	Passenger.	(inc. misc.)	Total.	W. structures.	Trains.	Traffic.	Portation.	Miscel. income.	General.	Total.	Net railway operating income (or loss).		
San Antonio & Aransas Pass.....	726	793,586	264,871	1,156,801	2,215,258	2,215,258	2,215,258	2,215,258	2,215,258	2,215,258	2,215,258	2,215,258	2,215,258	2,215,258	2,215,258
Seaboard.....	3,461	6,669,002	2,341,312	1,026,842	10,037,156	10,037,156	10,037,156	10,037,156	10,037,156	10,037,156	10,037,156	10,037,156	10,037,156	10,037,156	10,037,156
Southern.....	6,983	18,437,929	6,075,631	3,164,103	27,677,663	27,677,663	27,677,663	27,677,663	27,677,663	27,677,663	27,677,663	27,677,663	27,677,663	27,677,663	27,677,663
Southern Pacific.....	7,079	28,650,686	9,900,765	2,203,655	40,755,106	40,755,106	40,755,106	40,755,106	40,755,106	40,755,106	40,755,106	40,755,106	40,755,106	40,755,106	40,755,106
Spokane, Portland & Seattle.....	555	1,322,974	440,037	1,890,880	2,653,891	2,653,891	2,653,891	2,653,891	2,653,891	2,653,891	2,653,891	2,653,891	2,653,891	2,653,891	2,653,891
Staten Island Rapid Transit Co.....	24	226,682	188,578	453,175	714,435	714,435	714,435	714,435	714,435	714,435	714,435	714,435	714,435	714,435	714,435
Tennessee Central.....	295	385,504	116,716	54,304	556,524	556,524	556,524	556,524	556,524	556,524	556,524	556,524	556,524	556,524	556,524
Texas & New Orleans.....	468	1,371,560	426,247	1,965,725	2,763,532	2,763,532	2,763,532	2,763,532	2,763,532	2,763,532	2,763,532	2,763,532	2,763,532	2,763,532	2,763,532
Texas & Pacific.....	1,947	4,667,359	1,727,053	6,915,793	13,310,205	13,310,205	13,310,205	13,310,205	13,310,205	13,310,205	13,310,205	13,310,205	13,310,205	13,310,205	13,310,205
Toledo & Ohio Central.....	436	1,789,020	122,033	293,733	2,404,786	2,404,786	2,404,786	2,404,786	2,404,786	2,404,786	2,404,786	2,404,786	2,404,786	2,404,786	2,404,786
Toledo, Peoria & Western.....	248	234,446	135,395	396,092	766,933	766,933	766,933	766,933	766,933	766,933	766,933	766,933	766,933	766,933	766,933
Toledo, St. Louis & Western.....	451	1,998,994	112,246	2,111,240	3,416,480	3,416,480	3,416,480	3,416,480	3,416,480	3,416,480	3,416,480	3,416,480	3,416,480	3,416,480	3,416,480
Union Pacific.....	1,100	1,060,340	37,937	308,215	1,406,492	1,406,492	1,406,492	1,406,492	1,406,492	1,406,492	1,406,492	1,406,492	1,406,492	1,406,492	1,406,492
Union & Delaware.....	3,622	15,270,437	3,496,199	20,918,740	39,685,376	39,685,376	39,685,376	39,685,376	39,685,376	39,685,376	39,685,376	39,685,376	39,685,376	39,685,376	39,685,376
Union R. R. of Baltimore.....	8	527,121	126,989	20,918,740	24,732,977	24,732,977	24,732,977	24,732,977	24,732,977	24,732,977	24,732,977	24,732,977	24,732,977	24,732,977	24,732,977
Union R. R. of Pennsylvania.....	31	2,833,074	148,213	1,541,050	4,522,337	4,522,337	4,522,337	4,522,337	4,522,337	4,522,337	4,522,337	4,522,337	4,522,337	4,522,337	4,522,337
Vicksburg, Shreveport & Pacific.....	171	423,678	166,231	67,505	657,414	657,414	657,414	657,414	657,414	657,414	657,414	657,414	657,414	657,414	657,414
Washington.....	2,313	5,168,768	2,149,310	1,315,718	8,633,796	8,633,796	8,633,796	8,633,796	8,633,796	8,633,796	8,633,796	8,633,796	8,633,796	8,633,796	8,633,796
Washington-Pittsburgh Terminal.....	2,313	5,168,768	2,149,310	1,315,718	8,633,796	8,633,796	8,633,796	8,633,796	8,633,796	8,633,796	8,633,796	8,633,796	8,633,796	8,633,796	8,633,796
West Jersey & Seashore.....	36	249,455	343,233	770,714	1,363,402	1,363,402	1,363,402	1,363,402	1,363,402	1,363,402	1,363,402	1,363,402	1,363,402	1,363,402	1,363,402
Western Maryland.....	359	846,789	297,585	4,157,130	5,301,504	5,301,504	5,301,504	5,301,504	5,301,504	5,301,504	5,301,504	5,301,504	5,301,504	5,301,504	5,301,504
Western North Carolina.....	723	3,667,879	297,585	4,157,130	5,301,504	5,301,504	5,301,504	5,301,504	5,301,504	5,301,504	5,301,504	5,301,504	5,301,504	5,301,504	5,301,504
Western Ry. of Alabama.....	1,338	2,831,156	169,278	2,660,935	4,061,369	4,061,369	4,061,369	4,061,369	4,061,369	4,061,369	4,061,369	4,061,369	4,061,369	4,061,369	4,061,369
Wheeling & Lake Erie.....	512	2,281,439	203,222	2,696,655	3,187,819	3,187,819	3,187,819	3,187,819	3,187,819	3,187,819	3,187,819	3,187,819	3,187,819	3,187,819	3,187,819
Yazoo & Mississippi Valley.....	1,382	3,971,090	1,028,044	5,322,682	917,394	917,394	917,394	917,394	917,394	917,394	917,394	917,394	917,394	917,394	917,394

* Succeeded by Pittsburgh & West Virginia as of April 1, 1917.

Railway Wages in England

The last increase of wages of employees on the railways of Great Britain, which is based on an agreement reached without any stoppage of work, or even a threat of stoppage by any responsible leader, will mean an addition to the payrolls of \$30,000,000 a year. It was understood that the government, which guarantees the railways a certain income, would shoulder the entire responsibility for the additional expense. The wages of male employees over 18 years of age have been increased now four times since the beginning of the war, the first increase having been granted on February 15, 1915. For those earning over 30 shillings a week, the increases have been 2 shillings, 3 shillings 5 and 5 shillings, or a total of 15 shillings. Those receiving under 30 shillings a week, have also received a total advance of 15 shillings, though it did not come in exactly the same installments. Male employees under 18 years have received a total of 7 shillings 6 pence; female employees over 18 years, 5 shillings 6 pence; and under 18 years, 2 shillings 9 pence. The females received no advance until September 16, 1916.

California Petroleum

The committee on petroleum of the California State Council of Defense has made a report to the governor, proposing plans for averting the threatened shortage in California petroleum. These plans include the immediate drilling of wells in disputed territory, the exemption from military service of skilled workmen in the oil fields, the utilization of powdered coal, natural gas, hydro-electric power and other sources of energy wherever possible and improved correlation between the oil companies, the oil pipe lines, the steamship companies and the railroads. The members of the committee (appointed by the governor in May) are: Max Thelen (chairman), Eliot Blackwelder and David M. Folsom. Mr. Thelen is the president of the California Railroad Commission.

The committee finds that production is falling behind consumption at the rate of 35,800 barrels a day, and at the present rate of consumption the entire available storage supply in California will be exhausted by June 1, 1919. Manufacturers of oil well supplies and the railroads are called upon to expedite the production and transportation of oil well casing, drill stems, wire cables and similar material. It is recommended that lands in litigation be developed either through federal receivers or through the claimants to the lands, with due regard to the rights of all parties; and that additional lands be thrown open for development by the federal government.

California petroleum plays a vital part in commerce and industry far beyond the boundaries of the state, and it supplies the Pacific Coast fuel requirements of the United States Navy and Army. The report says:

"At the present rate of production by Kern Trading & Oil Company, the Southern Pacific Company's fuel oil bureau, bearing in mind also the purchases of fuel oil by the Southern Pacific, including 1,000,000 barrels bought from Union Oil Company and not as yet drawn on, and bearing in mind also the Southern Pacific's consumption of fuel oil, the Kern company's storage of fuel oil will be exhausted by December, 1917, unless the recently initiated additional drilling operations shall increase the Southern Pacific Company's production, and unless the Southern Pacific converts to coal those portions of its system which are located in proximity to the coal fields of Washington, the Rocky Mountain states and New Mexico.

"Coal cannot be substituted for California fuel oil to any substantial extent during the war because of present difficulties in the production and transportation of coal. Approximately 1,000,000 barrels of California fuel oil will be saved in the ensuing year in the Northwest by the substitution of coal for California fuel oil by the Oregon Short Line and other industries. The Los Angeles & Salt Lake and the Western Pacific are converting a portion of their systems in Utah and Nevada from California fuel oil to coal produced in the Rocky Mountain states. The Southern Pacific and the Atchison, Topeka & Santa Fe can also gradually convert from fuel oil to coal those portions of their systems which are in proximity to the coal fields of the Northwest, the Rocky Mountain states and New Mexico.

"The legislature of California has declared that oil pipe lines are common carriers, and the question whether the statutes are constitutional has been submitted to the Supreme Court of the state of California. If the legislation is sustained the railroad

commission will have authority to supervise the lines so that they may be operated to their greatest efficiency from the point of view of the entire transportation situation. If the jurisdiction of the railroad commission is not sustained, some other means must be provided, so that the oil pipe lines may be operated to full efficiency in the present emergency.

"A more efficient correlation of the use of oil pipe lines, railroad tank cars and tank steamers would result in the release of a considerable number of railroad tank cars, which are badly needed to serve the industrial needs of California and neighboring states. The Standard Oil Company reports that it is 3,500 tank cars short at its refinery at El Segundo, and that it is accordingly unable to fill urgent orders from the copper mines of Arizona."

The Western & Atlantic

The Western & Atlantic Commission, appointed by the legislature of Georgia, has made a report to the legislature giving its conclusions concerning the Western & Atlantic Railroad, of which the Nashville, Chattanooga & St. Louis has taken a new lease to date from December, 1919. The commission recommends that the State, as owner of the railroad, shall maintain continued engineering supervision of the road and that an engineer be regularly employed. Recommendation is also made for a fixed appropriation for a secretary; and the commissioners have allowed themselves salaries of \$100 a month each, except for two members, the governor and the chairman of the railroad commission, who serve without salary. The special attorney of the commission is allowed \$5,000 salary for the year 1916. The total cost of the road and equipment, from the beginning to the date of the first lease, was \$6,275,000. Since the state first acquired its ownership, 75 years ago, no property additions have been made to the railroad; but, on the other hand, valuable terminal properties have been disposed of, both in Atlanta and Chattanooga; also at other points on the line. It is estimated that to reproduce the road today would cost \$15,508,867. The commission is of the opinion that a second main track will have to be built before the expiration of the new lease, and in connection with that improvement it will also be necessary to revise curves and grades. The estimated cost of the double tracking, bridge work, etc., contemplated by the report, is \$3,775,000. As to certain real estate in Chattanooga not now used by the lessee, the commission is convinced that sooner or later it will all be needed for railroad purposes. Two parcels of this property, worth around \$200,000, have not been included in the new lease. Certain proposals for the acquisition of property and changing location of terminals in Atlanta are rejected.

The commission presents a statement to justify its action in executing a new lease at this time, rather than to incur further delay. The general railroad situation, the prospects of federal legislation of unknown effect, and the reasonable interests of the lessee are the main factors.

The proposal to build an extension of the state road, from Atlanta eastward to the sea, is dismissed as unwise. Such a line would involve economic waste and it would not prove to be a material factor in the control of freight rates.

The Engineering Council

On June 27 was held the first meeting of the Engineering Council. This body is a department of the United Engineering Society, and has recently come into being as a medium of co-operation between the four national engineering societies. The function of the council may perhaps best be described by the following extract from the by-laws of the United Engineering Society: "The council may speak authoritatively for all member societies on all public questions of a common interest or concern to engineers." The council is composed of 24 members, five being appointed by each of the four founder societies, and four by the United Engineering Society.

At the organization meeting held in the rooms of the American Society of Mechanical Engineers on June 27 the following officers were elected: President, I. N. Hollis; vice-presidents, H. W. Buck and George F. Swain; secretary, Calvert Townley; executive committee, the four officers named with J. Parke Channing and D. S. Jacobus.

The council discussed at length ways and means by which the founder societies through the council may be of use to the

nation. The unanimous desire to help the government in the prosecution of this war resulted in a resolution instructing the executive committee to co-operate with the government in procuring the services of engineers, also the appointment of a committee of three consisting of H. W. Buck, A. M. Greene, Jr., and Edmund B. Kirby, to consider the best means of utilizing the inventive ability of members of the founders' societies.

The secretary was instructed to inform all government bureaux that might be interested in the organization of the engineering council and its desire to be of assistance.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontious, 455 Grand Central Station, Chicago. Next meeting, July 18, 1917, Asheville, N. C.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—W. L. Connelly, Supt. of Telegraph, Indiana Harbor Belt, Gibson, Ind. Next annual meeting, September 11-13, 1917, Washington, D. C.

CANADIAN RAILWAY CLUB.—James Powell, P. O. Box 7, St. Lambert, near Montreal, Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 4th Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 4th Thursday in March, Hotel Statler, Buffalo, N. Y.

CHIEF ELECTRICAL CLUB OF DIRECTORS OF RAILROADS.—FOREMAN'S ASSOCIATION.—W. R. McMunn, New York Central, Albany, N. Y. Next convention, September, 1917, St. Louis.

CINCINNATI RAILWAY CLUB.—H. Boulet, Chief Interchange Inspector, Cincinnati, 101 Carver Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 568 Union Arcade Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3rd Tuesday, Pittsburgh, Pa.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

INVESTMENT BANKERS' ASSOCIATION OF AMERICA.—Frederick R. Fenton, 11 W. Monroe St., Chicago. Annual convention, October 1-3, 1917, Baltimore, Md.

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

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Geo. A. J. Hochgrebe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PACIFIC RAILWAY CLUB.—V. S. Culler, Assistant to Chief Engineer, Northwestern Pacific R. R., San Francisco, Cal.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, New York.

RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1608 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial Annex Hotel, Pittsburgh.

RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, office of the president's assistant, Seaboard Air Line, Norfolk, Va. Next meeting, October 2-4, 1917, St. Louis, Mo.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next annual convention, September, 1917, Atlantic City, N. J.

RICHMOND RAILWAY CLUB.—F. C. Robinson, 100 N. Richmond St., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C & N. E. Station, III. Next annual convention, September 18-21, 1917, Hotel Auditorium, Chicago.

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

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Hotel Astoria, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Gen'l Agt. Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings bi-monthly, Pittsburgh.

TRAVELING ENGINEERS' ASSOCIATION.—W. C. Thompson, 1117 C. R. R. Bldg., Cleveland, Ohio. Next convention, September, 1917, Chicago.

UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1911 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

WESTERN CANADIAN RAILWAY CLUB.—Kemp, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

Traffic News

The Southern Railway has already begun running passenger trains daily between Louisville, Ky., and the cantonment which is being established by the War Department south of that city.

The Baltimore & Ohio reports that in the month of May the company's four limited trains between New York and Chicago, Nos. 5, 6, 7 and 8, arrived at final destination on time 98 per cent of their trips. Through freight train, No. 97, between New York and Chicago, arrived on time at destination 25 days during May.

Pending final adjudication of the Illinois passenger fare case, the railroads and the Illinois authorities have come to an agreement, according to which the carriers are collecting 24 cents a mile, at the same time giving coupons representing the difference between the fares at the 2-cent and the 24-cent rates. These coupons will be redeemed by the railroads if the lower rate is sustained.

The Canadian Pacific announces that during the summer season, and up to September 30, open top observation cars will be attached to the rear of four trains between Field, B. C., and Kamloops, and on two trains between Sicomous and Vancouver, for the free use of standard sleeping car passengers. The schedules have been arranged so that the entire trip through the mountains may be made in daylight.

The Public Utilities Commission of New Jersey has issued a statement replying to a complaint that the railroads have been unreasonable in their curtailment of passenger train service. The commission says that most of the complaints have been based on unwillingness to bear inconvenience which is not great. The statement justifies the railroads in diminishing passenger service in order to provide additional facilities for moving the increased freight traffic.

The movement of traffic through the Suez Canal, in 1916, amounted to 12,325,347 tons, a falling off of about three millions from the movement of 15,266,155 tons in 1915—which, in turn, was about four millions less than the total in the year preceding. The toll rates paid by vessels going through have been increased and now are about 36 per cent higher than before the war. The number of vessels passing through in 1916 was 3,110, a decrease from 1915 of 598 vessels.

The Public Service Commission of Maryland has authorized the railroads of the state to file freight tariffs showing increases substantially equivalent to those which have been or may be authorized by the Interstate Commerce Commission, in connection with its recent order, for interstate business. The Maryland commission at the same time has authorized the Pennsylvania and the Western Maryland to make certain increases in charges for storage of iron and steel articles.

The South Dakota Railroad Commission has ordered the adoption in that state of the same demurrage rules that govern interstate business. The Public Utilities Commission of Kansas has issued an order continuing in effect the demurrage rules previously in force, which provide for charges of \$1 a day per car for the first two days after 48 hours' free time, \$2 per car for the next two days, \$3 per car for the subsequent two days, \$4 for the next two days and \$5 per car for each succeeding day.

The commercial development department of the Baltimore & Ohio has begun an agricultural preparedness survey. It will cover each county adjoining the lines of the road and will show the number of acres in 1917 and 1916 planted in potatoes, beans, peas, wheat, buckwheat, oats, other grains and vegetables. It is also intended to show which of the following items has been the limiting factor in the increased production: lack of labor, cost of seed or fertilizer, character of the land, lack of equipment or limited capital.

In the Federal court at Lexington, Ky., June 23, suits were filed by the Amherst Coal Company and the Virginia-Buffalo Coal Company against the Chesapeake & Ohio Railway for

\$550,888 damages for failure to furnish coal cars sufficient to take the shipments which these companies would have sent but could not. The first-named company sues for about one-third of this amount, and the other one for two-thirds. The suits have to do with the period from December, 1915, to April, 1917, the charge being that during this period the shippers lost profits on about 300,000 tons of coal which they could have sold if they could have shipped it. An itemized list is presented showing the amounts of coal which ought to have been shipped each month. Other similar suits have been filed against this road by other coal companies in the same court.

Car Efficiency in Detail

The San Francisco committee of the Car Service Commission has issued an appeal to the public which says in part:

Shippers: Order direct, in writing, from local representatives at points of loading only the number and kind of cars suitable for your needs, together with the amount or weight of shipments. Load and furnish shipping instructions in one day; the earlier in the day the better the opportunity to get car moving. In accepting orders for shipments secure sufficient tonnage to fill completely a 60-, 80- or 100-thousand lb. capacity car, including the 10 per cent which cars may be loaded above marked capacity.

Receivers: Place your orders in quantities to provide a full carload, as above described. . . . Unload cars the day received. Quick release increases the supply available for yourself and others. . . . Loss of car space and capacity is the most serious factor today causing the so called car-shortage.

Curtailment of Passenger Service in West

The withdrawal of passenger trains from service on western roads has not been so general or as far reaching as in the East. Railroad officers state that they are prepared to take off trains as soon as the movement of troops and military supplies reaches the volume which makes such a step necessary. Up to this time the changes that have been made, except on a few roads, affect local service mainly. The Chicago & Alton recently withdrew from service trains aggregating about 1,000 passenger-miles per day. The Chicago, St. Paul, Minneapolis & Omaha removed a number of local trains from service, effective July 8, including six trains each on the eastern, northern and western divisions, and two on the Nebraska division. On July 14 the Illinois Central will discontinue two trains running between Fulton, Ky., and Memphis, Tenn. In April the Chicago Great Western took off a passenger train running between Randolph, Minn., and Mankato; one between Waverly, Iowa, and Sumner, and one between Cedar Falls, Iowa, and Cedar Falls Junction. The Wabash on June 24 discontinued a train between Montpelier, Ohio, and Buffalo, N. Y., and one between Buffalo, N. Y., and Detroit, Mich. The Atchison, Topeka & Santa Fe announces that it expects to run all of its transcontinental trains as heretofore, and orders have recently been placed with the Pullman Company for additional sleeping cars.

Long Island Traffic in Manhattan

The contract under which the Long Island uses the Pennsylvania Station, Seventh avenue, Manhattan, New York City, as its western terminal, expires on July 1, and the New York State Public Service Commission, First district, has been holding hearings on the application of the company for permission to renew the contract for one year. The Long Island pays the Pennsylvania \$810,000 for its accommodations, including track rights from Sunnyside, four miles east of the terminal, and electric current for motive power.

The basis of payment, which is the number of cars run to and from the terminal station, was questioned, but the representative of the road replied that this made little or no difference, as the compensation was much below a reasonable percentage on the cost of the railroad and terminal. The Manhattan terminal has cost the Pennsylvania Railroad \$112,000,000.

The Long Island uses seven of the 24 tracks in the station; and 70 per cent of the passengers using the station are those who leave or take Long Island trains. The Pennsylvania, carrying only 30 per cent of the passengers, brings into the station 70 per cent of all the cars. The number of passengers to and from the terminal in Long Island trains last year was 13,000,000, an increase of about 7,000,000 since 1912.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The commission has issued a memorandum to clear up a misunderstanding as to the interpretation of its decision in the 15 per cent rate case allowing increases in class rates in Official Classification territory. The decision authorizes increases in class rates applying intra-territorially and differences of opinion as to what rates are included in class rates have arisen. The commission holds that rates that are published as class rates or as specific percentages of certain class rates are "class rates," and that rates that are published in the form of commodity rates, and which do not automatically change with a change in the class rate, even if the basis of making them is a percentage of some class rate or rates, are not included in the term "class rates." Rules 25, 26 and 28 in the Official Classification are regarded as respective classes.

Commission Cannot Require Use of Special Equipment

Railroad Commissioners of the State of Florida v. Southern Express Company et al. Opinion by Commissioner Clark:

Upon complaint that the facilities for the shipment of strawberries from Florida points to various destinations in eastern trunk line territory are inadequate and defective and that the rates for transportation and refrigeration are unjust and unreasonable; the commission holds, that following the decision of the Supreme Court of the United States in *United States v. Pennsylvania R. R. Co.*, 242 U. S., 208, the commission is without authority, in the absence of undue discrimination, to order carriers to acquire equipment of a special type or to require the transportation of refrigerator cars in passenger or special trains. The rates and refrigeration charges for the transportation of strawberries from and to points involved, are not shown to be unjust or unreasonable. (44 I. C. C., 645.)

Rate Advances

The commission has given special permission to the western railroads to file supplements to their freight tariffs upon not less than five days' notice increasing rates on coal and coke by not to exceed 15 cents a ton, in accordance with its decision in the 15 per cent rate case. The order provides that such supplements may provide for a horizontal increase in rates, to the extent specified, without specifically publishing the exact rate per ton, and without strict regard to the tariff rules restricting the issuance of supplements, provided that the carriers obligate themselves to file on statutory notice new tariffs to replace such supplements. The carriers have arranged to put the new rates into effect at once.

The commission has also issued an order, in response to an application by a committee representing the carriers in official classification territory, authorizing them to establish the advanced class rates authorized by the findings of the commission in the 15 per cent case, and to continue the general rate relations existing in the present rates, without observing the long and short haul provision of the law. The supplements proposing the general 15 per cent advance, which were suspended by the commission until October 28, were promptly cancelled by the carriers in response to the suggestion of the commission in its decision.

The commission has given permission to the Southern Pacific to change on one day's notice its rates on commodities transported as all water shipments between New York and New Orleans, and between New York and Galveston, in accordance with its application of June 13, to put into effect rates which will meet the findings of the commission under the company's application under the Panama Canal Act in connection with its ownership of Atlantic steamship lines.

The commission has vacated the suspension orders in 60 cases on its investigation and suspension docket in which the carriers have filed tariffs cancelling the schedules under suspension.

C. F. A. Class Scale Rates

The Interstate Commerce Commission, in a decision by Commissioner McChord, given in 45 I. C. C., 254, has allowed the carriers to remodel their scale of class rates in Central Freight Association territory, with a view to putting them on a more consistent and in general on a somewhat higher scale than the present one. A brief abstract of the commission's decision follows:

In the commission's first report in the Five Per Cent Case, 31 I. C. C., 351, the commission found, among other things, that the class rates in C. F. A. territory were on a lower scale than elsewhere in the country and held that the carriers were entitled to the increase sought and probably more. It was pointed out that the existing class rate structure was "honey-combed with inconsistencies," and it was suggested that a general readjustment would be desirable.

The carriers thereupon proceeded to make a general revision of their rates, and after two years' work have submitted a new rate structure. The proposed new system is designed both to yield the carriers greater revenues and remove some of the inconsistencies in the present rate structure. The case, however, has no particular connection with the 15 Per Cent Case, 45 I. C. C., 303. So far as the lines in C. F. A. territory are concerned that increase was asked in addition to and built upon the rates here involved.

Considerable sentiment was manifested among the shippers at the hearing in favor of permitting the carriers the increased revenue which would be yielded by the rates in issue. This was probably why many persons believed that the carriers should have some assurance in view of the unusual conditions confronting them. It is probable; however, that there might have been some opposition had the proposal for the general increase of 15 per cent taken definite shape before the hearings in this case were concluded. The principal objection to the proposed rates was on the part of the localities which now enjoy rates designed to relieve them of some of the disadvantages of location and which are here called upon to pay rates made with a greater regard for distances and transportation conditions generally.

Owing to differences in traffic and transportation conditions, respondents in the first place propose to divide C. F. A. territory into three separate sections or zones, and to use three separate scales of rates. The principal zone embraces all the territory on and south of the line of the Michigan Central from Chicago to Detroit, through Kalamazoo and Jackson, Mich., and will be hereinafter referred to as zone "A." The two other zones are in Michigan and are to be known as zones "B" and "C." Zone B lies immediately north of zone A, and is bounded on the north by a line running from Muskegon, on the east bank of Lake Michigan, eastwardly across the state through Greenville, Edmore, Alma, Saginaw, Midland, Bay City, and Sandusky, Mich., to Lake Huron. Zone C lies directly north of zone B and includes the remainder of the southern peninsula of Michigan. The northern peninsula of Michigan, with the exception of the cities of Menominee and Manistique, is not in C. F. A. territory. Zone C also embraces, via car-ferry routes, the west bank of Lake Michigan north of Milwaukee, Wis. Respondents propose one scale of rates for general use within zone A, but two higher scales for making rates to apply between zones B and C, respectively, on the one hand, and zone A on the other. For instance, the zone A scale is to be applied from Cincinnati to Toledo, Ohio; the zone B scale from Cincinnati to Lansing, Mich., and the zone C scale from Cincinnati to Alpena, Mich. In determining the actual rates between given points, the proposed procedure is as follows: For one-line hauls of distances up to and including 70 miles, the scale is strictly applied; that is, in accordance with actual distance. But actual distance is not applied via one-line hauls of more than 70 miles or for hauls of any length over two or more lines, except between basing points. In the two latter cases rates between the various basing points are arrived at by applying the scale in accordance with actual distance, and the rate to or from any intermediate point is the same as the rate to or from the basing point next beyond—no matter how far beyond. These situations represent what the protestants call "inflations."

The commission in its findings refuses to accept the zone A and zone B scales as proposed by the carriers, but suggests new scales. Concerning these scales and its objections to the carriers'

scales, it says: "While we are convinced that, upon the whole, the proposed system of rates is superior to the present rate structure, we cannot allow it to become effective. The scales must be broken up into smaller mileage blocks, and the so-called inflations reduced by the observance of substantially actual distances on one-line hauls, and by the setting in of additional basing points for hauls over two or more lines, except to and from zone C, wherever the distance between the basing points now used exceeds 20 miles. The proposed rates, like the present rates, are preferential to short-haul traffic. The rates from Cadillac and Jennings, Mich., as applied to lumber, should be placed on the same basis as regards the relationship to sixth class, as may be contemporaneously applied from other Michigan producing points, except where competitive conditions may warrant a departure. The charging of a slightly higher basis of rates to and from zones B and C has our approval. We will not interfere with the groups as proposed, nor with the methods used in applying the scales, except as noted above. To grant the prayer of the cities adversely affected by the removal of preferences, the commission would in effect require what the act to regulate commerce was largely designed to prevent, namely, unlawful discrimination. Rate relationships long maintained may not be lightly disturbed, but where they are not justifiable as a matter of law we cannot require their continuance.

"As fully appears from the consideration discussed in this report a determination of reasonable class rates for application in C. F. A. territory must take into account numerous conditions, such as rate adjustments effective in the past and the rates now applicable to traffic between C. F. A. and trunk line territories, which tend to support a different basis of rates than that which might be found reasonable in the absence of such conditions. We find that respondents have not justified the rates named in the suspended tariffs. We further find that the scales of class rates compiled by the commission and given in Appendices Nos. 9 and 10 of the report are reasonable and may be used in lieu of respondents' scales A and B and in the same manner, subject to the modifications required by the next preceding paragraph. These scales are divided into 5-mile blocks for distances up to and including 100 miles. They then progress by 10-mile blocks up to and including 300 miles. Beyond that, 20-mile blocks are used. The zone A scale begins with 16 cents as the first-class rate for 5 miles and less. One cent is added for each succeeding block up to and including 50 miles. Beyond that, up to and including 100 miles, on the theory that the charge per ton-mile should decrease, it progresses by additions of one-half cent for each mileage block. Thence, up to and including a distance of 200 miles, it progresses by additions of 1 cent per block, or twice as much as for the blocks for the distances from 50 to 100 miles, for the reason that the blocks are doubled in size. On the theory that the charge per ton-mile should further decrease for longer distances, an increase of one-half cent per block is then used up to and including 300 miles. Beyond that, as the blocks have doubled in size, the degree of progression is doubled, 1 cent per block being observed. The rates on the lower classes are in all cases related to first class, according to the following percentages:

1	2	3	4	5	6
100	85	67	50	35	28

"We may say as a matter of information that in the Chicago-New York scale the rates for the lower classes appear to be related to the first-class rate, according to the following percentages:

1	2	3	4	5	6
100	86½	66½	46½	40	33½

"The zone B scale starts with a rate 2 cents higher on first class for 5 miles than does the zone A scale. For use to and from zone C, or subdivisions thereof, respondents may work out scales of differentials to be added to the rates in the zone B scale.

"In publishing the rates the following rule for the disposition of the fractions shown in these scales shall be observed: Fractions of less than $\frac{1}{4}$ or $\frac{2}{5}$, to be omitted; fractions of $\frac{1}{4}$ or $\frac{2}{5}$, or greater, but less than $\frac{3}{4}$ or $\frac{7}{5}$, to be shown as one-half ($\frac{1}{2}$); fractions of $\frac{3}{4}$ or $\frac{7}{5}$, or greater, to be increased to the next whole figure.

"In connection with this case, hearing was had upon applications for continuance of certain existing departures from the long-and-short-haul rule of the fourth section of the act, but they will be disposed of separately."

PERSONNEL OF COMMISSIONS

M. O. Lorenz, assistant statistician of the Interstate Commerce Commission, has been appointed acting statistician, succeeding W. J. Meyers, resigned.

W. M. Lockwood, examiner in the division of statistics and accounts of the Interstate Commerce Commission, has been appointed chief clerk and purchasing agent, succeeding Lester Sisler.

COURT NEWS

A Ten Year-Record

It was in 1907 that the State of New York, under the leadership of Governor Charles E. Hughes, passed its radical and comprehensive law for the regulation of railroads and other public utilities, abolished its old railroad commission and provided for two new commissions, one of which has to do only with New York City. This last-mentioned commission has issued a brief review of its work, which says in part:

"The Public Service Commission for the First district was ten years old on July 1. Under the powers granted by the law the commission is constructing the great dual system of rapid transit involving the expenditure of an amount between \$350,000,000 and \$400,000,000, about one-half of which is being contributed by the City of New York. This work has been properly described as the greatest single municipal transportation achievement in America. This system, including the third tracking of the elevated lines, will add 345 track miles to the existing subway and elevated rapid transit mileage, and will give New York City something more than 600 track miles of such lines, more than is possessed by any other single city in the world, and more, it is said, than all of the other cities of the United States put together. Under its regulatory powers the commission for the First district has exercised jurisdiction over stock and bond issues of corporations, and has effected a great and positive saving of human life by the enforcement of safety precautions and the installation of safety devices. It has handled many thousands of complaints from the patrons of public utilities, and has settled a large proportion of those complaints really justified, to the satisfaction of the complainants.

"The strength of the law has been demonstrated by the fact that during the ten years it has undergone very few amendments. Corporations have always fought the commission, and even today a gas company is questioning its right, in the United States Supreme Court, to direct an extension of its lines for the benefit of persons in an outlying and sparsely settled community. But the majority of the corporations have accepted its jurisdiction in a sportsmanlike spirit, and they have fallen into the habit of yielding gracefully to its orders when they fail to evade them by blandishments.

"Under the unlagging labor of the commission the dual system is nearing completion. There is a prospect that a large proportion of the most important lines will be in operation before the end of the year.

"Important results of the commission were the elimination of horse cars, additional facilities in the subways, such as steel cars, longer platforms, longer trains, new means of ingress and egress, and signal control in subway operation by which the greatest number of trains can be safely operated in the least amount of time.

"Because of the transit bureau maintained by the commission with a large force of inspectors, the public utility corporations find it difficult to maintain for any length of time any method of conducting their business that threatens the public welfare.

"Through its electrical engineer, its gas engineer, and its bureau of gas and electricity the commission has performed extremely important work in connection with the rates charged and the quality furnished. Important reductions in rates have already been made.

"There are in the city some 400 grade crossings on high speed railroads. Their elimination is an extremely costly proposition, but the commission has undertaken the task by beginning the elimination of some of the most dangerous of them, and there are to date eliminated or in process of elimination forty-two of the worst crossings, involving a total expenditure of \$4,211,000."

Excessive Damages for Wrongful Ejection

A passenger boarded a train at Gower, Mo., to go to St. Joseph, 20 miles away, without having had time to buy a ticket. The lawful rate of fare was 2 cents a mile, and he tendered 40 cents to the conductor, who refused it and demanded 60 cents, or 3 cents a mile. The passenger refused to pay this rate and was ejected half or three-quarters of a mile from the station, to which he had to walk back. Some time prior to this the Supreme Court of the United States had dissolved the injunction which the railroad had obtained against the enforcement of the two-cent fare law. In an action against the company the passenger claimed actual and punitive damages grounded on the conductor's manner and conduct towards him. The conductor took the passenger by the arm and led him to the door of the car, but there was no scuffle. The evidence conflicted as to whether the conductor swore. The jury returned a verdict of \$5 actual and \$500 punitive damages. The trial court, accepting the jury's view that some punitive damages should be allowed, thought the award excessive and offered the plaintiff an opportunity to take \$100 punitive damages. This the plaintiff refused, and on appeal the Kansas City Court of Appeals affirmed the judgment of the trial court granting a new trial.—*Smith v. Atchison, T. & S. F.* (Mo.) 194 S. W. 71. Decided April 2, 1917.

Putting Off Passenger at Wrong Station—Excessive Damages

A minor passenger 16 years old was told by a train employee that her station was reached and he assisted her from the train at the wrong station. The train left before she could board it again. The station agent took her to his house, where she spent the night and next day she was carried to her destination by another train. In an action for damages the Mississippi Supreme Court held that an award of \$500 was excessive and reduced it to \$200.—*Yazoo & M. V. v. Duke* (Miss.), 74 So., 693. Decided March 26, 1917.

In another case in the same court it appeared that a female passenger was set down at the wrong place and had to walk something like half a mile to the station in the rain. The court held that a verdict in her favor for \$750 was grossly excessive and should be set aside and a new trial ordered unless the plaintiff consented to a remittitur of \$650, in which case she should have judgment for \$100.—*Case v. Yazoo & M. V.* (Miss.), 74 So., 773. Decided April 9, 1917.

A passenger, a farm hand, who had almost reached his majority, was wrongfully ejected from a train on a dark night in July and compelled to walk 20 miles to his destination next day. He was made sick by a cold and rendered unable to work for about a week. The Springfield Court of Appeals (Mo.), held that a verdict of \$750 was excessive and a new trial was ordered unless the plaintiff would remit \$400 of that amount.—*Davis v. Lusk* (Mo.), 190 S. W., 362.

Proof of Cause of Fire

In an action for damages for the destruction of a shed and certain hay and straw, it was alleged that the property was negligently set on fire by "coals of fire" from the defendant's engine. The plaintiff asserted that all that it is necessary to prove in the jurisdiction of Utah is that the fire was caused by an engine, and from that fact it may be inferred that the fire was negligently set. The Utah Supreme Court, however, held that the question always is, How is the fact established that an engine caused the fire in question? In no case in any court where the matter is not covered by statute has it been held that all that is necessary to prove is that an engine passed certain premises, and that a fire was discovered on those premises a short time thereafter. It is universally recognized that there must be some evidence from which it may legitimately be inferred that the fire in question was caused by the passing engine and not by some other agency. To establish the probability that the engine in question caused the fire, the plaintiff may show that the engine, at the time the fire was set, cast out live sparks, or that it set fire to the dry grasses, or otherwise; and to strengthen the probability that engines do set fires, it may also show that other engines of the defendant did the same thing within a reasonable time both before and after the fire in question. When these facts are shown, the jury may infer that the fire was caused by the engine. It is important to keep in mind, however, that railroad companies are by law

permitted to operate their engines by means of fire; and also that it is possible that engines may cause fire without negligence. It is necessary, therefore, to prove: (1) That the fire in question was caused by an engine of the defendant; and (2) that it was negligently caused. Negligence may be inferred if it is shown that the engine caused the fire, but until that is shown by the exclusion of other agencies, there can be no inference of negligence.—*Gleason v. San Pedro, Los Angeles & Salt Lake* (Utah), 164 Pac., 484. Decided April 4, 1917.

Rebelling Interstate Shipments

In an action for damages for injury to live stock during transportation from West Plains, Mo., to Princeton, Kan., the principal question was whether or not the shipment was interstate. The court stated the facts as follows: "West Plains is a station on the Frisco; Princeton is a station on the Santa Fe. The plaintiff loaded an emigrant car with household goods and horses at West Plains, and billed the car to Kansas City, Mo., over the Frisco. The car was there delivered to the Santa Fe and was rebilled by the Santa Fe to destination. The Santa Fe billing read from Argentine, Kan., to Princeton. Argentine is separated from Kansas City by the line between the two states, but the Santa Fe yards at Argentine extend into Kansas City (Mo.). The car was placed on the Santa Fe tracks by the Frisco. The car, in fact, passed in course of continuous transportation, without unloading, from West Plains to Princeton. The plaintiff testified that the Frisco agent at West Plains would not bill the car to any place in Kansas unless the horses were inspected. In order to avoid inspection the plaintiff billed the shipment to Kansas City, intending to drive the horses from there to Princeton. On the way to Kansas City, or when the car arrived there, he changed his mind, and after inspection, the horses went on in the car with the household goods. The horses were injured while on the line of the Santa Fe. The trial court allowed the jury to determine the character of the shipment, under an instruction that they might find it was not interstate if they found the plaintiff's original intention was to ship the horses by rail to Kansas City and then drive them to Princeton. The jury found the shipment was not interstate." Judgment for the plaintiff was reversed, on appeal, by the Kansas Supreme Court for the following reasons:

The only conflict in the evidence was whether the Frisco, when it placed the car on the Santa Fe tracks, left the car on the Kansas side, or the Santa Fe's switch engine which picked up the car crossed the state line to get it. The court did not regard this matter as material. It is well settled that the essential character of commerce, as disclosed by all the facts, and not its incidents, such as local or through bills of lading, determines its character as interstate or otherwise. In this instance, Kansas City was at no time the destination of the horses any more than it was the destination of the household goods in the same car. All the articles in the car were destined from the beginning for Princeton. To avoid the burden of inspection, the plaintiff at first intended to change the method of transporting the horses on arrival at Kansas City, but with the exception that the horses were to be unloaded there for driving, all the property placed in the car started on a continuous journey, not to Kansas City, but to Princeton. On the way to Kansas City, or on arrival there, the plaintiff concluded not to substitute driving for railroad transportation, and the car with its original contents proceeded uninterruptedly to its previously determined destination. The necessary rebilling was a mere incident to the shipment as to both the horses and the household goods. In taking the car from the Frisco the Santa Fe was apprised of the fact that it was completing a shipment originating on that road. To hold that the Santa Fe billing was an independent, intrastate matter would open the way to evasions which would deprive Congress of control over interstate commerce.

The bills of lading of both railroads required an action to be commenced within six months. This was not done. There was evidence of conduct on the part of Santa Fe employees which under local rules might have amounted to a waiver of the limitation. Since the shipment was interstate, however, the railroad could not waive the provision.—*Easdale vs. A. T. & S. F.* (Kan.), 164 Pac. 164. Decided April 7, 1917.

Equipment and Supplies

LOCOMOTIVES

THE BOSTON & MAINE is reported as contemplating the purchase of locomotives.

THE FORT SMITH & WESTERN has ordered 2 Consolidation locomotives from the Baldwin Locomotive Works.

THE ST. CLAIR REFINING COMPANY, Chicago, has ordered one six-wheel switching locomotive from the American Locomotive Company.

THE ATCHISON, TOPEKA & SANTA FE has ordered 30 Mikado locomotives from the Baldwin Locomotive Works for January delivery, and has reserved space for an additional 70 locomotives for 1918 delivery.

THE KURE NAVAL YARD of the Imperial Japanese Navy has ordered 3 four-wheel tank locomotives from the American Locomotive Company. One of the three locomotives will weigh 97,000 lb., and other two 42,000 lb. each.

FREIGHT CARS

THE SHELL COMPANY, Los Angeles, Cal., is in the market for 50 to 100 tank cars.

PHELPS, DODGE & CO., New York, have ordered 250 gondola cars from the Standard Steel Car Company.

THE UNION RAILROAD has ordered 1,500 70-ton hopper cars for the H. C. Frick Coke Company from the Ralston Steel Car Company. The Union Railroad was also reported in an unconfirmed item in the *Railway Age Gazette* of June 29 as having ordered 1,000 cars from the Greenville Steel Car Company; this item was incorrect.

IRON AND STEEL

THE GREAT NORTHERN has ordered 270 tons of bridge steel from the Wisconsin Bridge Company.

SIGNALING

THE ATCHISON, TOPEKA & SANTA FE has ordered from the Union Switch & Signal Company 49 one-arm signals—three-position double case, 2-phase A. C. Style "S," which will be installed by the railroad company on the Goffs-Bagdad division.

THE PHILADELPHIA, BALTIMORE & WASHINGTON has ordered from the Union Switch & Signal Company an electro-mechanical interlocking machine to be installed by the railroad forces at Harrington, Del. The machine will have 17 mechanical and 6 electric working levers.

THE PHILADELPHIA & READING has ordered from the Union Switch & Signal Company a type "F" electric interlocking plant to be put in at Skillman, N. J. The interlocking machine, model 14 d. c., will have 13 switch and 15 signal levers. The track circuits for this interlocking will be a c.

THE LOUISVILLE & NASHVILLE is to install automatic block signals on its line between Montfort, Nashville and Corbin, and La Follette, Tenn. Thirteen Style "S" low voltage ground signals and auxiliary apparatus will be required and are to be supplied by the Union Switch & Signal Company.

THE BUFFALO, ROCHESTER & PITTSBURGH is to install an electric interlocking machine near DuBois, Pa., with a machine having 11 working levers and 5 spare spaces; also, at other places, three mechanical interlockings. The General Railway Signal Company furnishes the material and will install the electric apparatus.

AERIAL MAIL FROM ITALY TO SICILY.—Aerial mail service was inaugurated on June 27 in Sicily. An airplane which left Naples at 604 a. m. arrived at Palermo three hours later, returning to Naples in the evening with Sicilian mails.

Supply Trade News

Charles B. Yardley has been elected president of Steel & Iron Mongers, Inc., with offices at 796 Broad street, Newark, N. J.

Murray Shipley has sold his entire interest in the Lodge & Shipley Machine Tool Company, Cincinnati, and has severed his connection with that company.

At a meeting of the board of directors of the American Locomotive Company, held June 21, L. A. Larsen was appointed assistant comptroller, effective July 1.

Willard Doud, consulting engineer, Old Colony building, Chicago, Ill., has closed his office temporarily to accept a commission as lieutenant, junior grade, in the United States Naval Reserve. He has been assigned to active service at the Naval Training Station, Great Lakes, Ill.

Charles S. Clark, formerly sales agent of the Pennsylvania Steel Company at Boston, has been elected first vice-president and general manager of the Laconia Car Company, and will make his headquarters at Laconia, N. H., where the business of the company will be transacted hereafter.

Daniel A. Wightman, formerly general manager of the Pittsburgh Locomotive Works, died at Warren, R. I., July 6. Mr. Wightman was born at East Greenwich, R. I., in 1846. He was educated in the public schools of that town, and after a course in an evening school in Providence, entered the employ of the Rhode Island Locomotive Works as a draftsman. In 1876 he went to the Pittsburgh Locomotive Works as superintendent. He later became general manager and held that position when he retired in 1902.

Harrison Arms, president and founder of the Arms Palace Horse Car Company, Chicago, died at his country home at Marshall, Mich., on July 5. While engaged in the livery business at Toledo, Ohio, he conceived the idea of equipping railroad cars to carry horses in a safe and humane way by providing each horse with a separate stall and adequate feeding and watering facilities while in transit. He later invented and patented the "Arms Palace Horse Car," embodying all of these features, and in 1885 organized and incorporated the Arms Palace Horse Car Company, of which he was elected president, which position he actively filled until his last illness.

David A. Munro, formerly manager of the J. N. Johns Manufacturing Company, has accepted a position with the Railway Specialties Corporation, New York, and will take active charge of that company's railroad department. Mr. Munro was born in Scotland. He came to this country in February, 1907, and in October of the same year entered the auditor's office of the Metropolitan Street Railway in New York. He was later assistant to the auditor of the Second Avenue Railroad of New York, and was shortly afterwards appointed purchasing agent to the receiver in addition to his other duties. On December 1, 1916, he resigned to enter the supply field as manager of the J. N. Johns Manufacturing Company.

Oden H. Wharton, formerly assistant to the president of the Crucible Steel Company, has been elected president of the company. Mr. Wharton was born at Easton, Pa., and received his schooling at that place. His first business association was with Park Brothers & Co., Ltd., at that time operating the Black Diamond Steel Works in Pittsburgh. He started as office boy, then became billing clerk and finally a salesman. Later he was connected with the sales department of the Park Steel Company in Cleveland and other cities. He went to Boston for some years as representative of the Park Steel Company, and later of the Crucible Steel Company of America, and was finally appointed general manager of sales of the latter company, with headquarters at Pittsburgh. After holding this position for several years his health failed, and he was succeeded by Renben Michener, the present general manager of sales. Mr. Wharton traveled in Europe for a year or more, and, regaining his health, was appointed assistant to President Charles C. Ramsey, of the Crucible Steel Company, who died recently.

American Car and Foundry Company

The American Car and Foundry Company in the fiscal year ending April 30, 1917, had earnings from all sources of \$17,522,909. After deducting from this \$7,212,037 for renewals, replacements, repairs, new patterns, flasks, etc., and the cost of special equipment for the production of munitions, there was left net earnings of \$10,310,872. The surplus for the year, after the deduction of dividends and reserves, was \$1,010,872, and the total surplus at the close of business on April 30, 1917, was \$26,820,965, as compared with \$25,810,094 on April 30, 1916.

The annual report to the stockholders, submitted by President W. H. Woodin, says in part: "The close of your fiscal year saw the United States at last drawn into the great conflict of nations that for almost three years has been devastating the earth, and witnessed the beginning of that marshaling of our national resources and industries which it is to be hoped will speedily prove the decisive factor in the great struggle.

"Your company was among the first to place its facilities unreservedly at the disposal of the government, to be put to such use as might best suit the national needs. Already some portion of the work which our country has taken upon itself as its part in the righteous war in which we are engaged, has been allotted to your company, and it is a fair assumption that we shall hereafter be called upon to play an increasingly greater part in the struggle that lies before us. Our government, and the stockholders, may be assured that this company will give of its best—in experience, in organization, in production—to insure the making of that lasting peace short of which the United States and its allies will not stop.

"From the viewpoint both of operations and results, the year has been a satisfactory one. The performance of your company in the production of munitions has been gratifying not only as to quality but also with respect to volume and speed of production, and has not been excelled by any other company in the United States. The representatives of the governments for which your company has been producing munitions have been unstinted in their expressions of approval of its organization and methods. The experience acquired in this branch of industry will without doubt prove of very great value to our government, enabling your company quickly and economically to meet what promises to be a very large demand for such supplies.

"A fair share of the year's earnings resulted from the conduct of your company's ordinary business in the manufacture and sale of cars and miscellaneous supplies. Material costs have been high and are likely to continue so. This, together with the increased cost of operating, coupled with an inability to obtain a corresponding augmentation of revenue, makes it growingly difficult for the railroads to finance the purchase of new equipment in quantities sufficient to meet the normal traffic requirements of the country. The need of means of transportation, both for domestic and foreign use, is so great, however, that it is reasonable to expect that, with the advent of more propitious conditions, your company's facilities for this line of production will continue in fair demand.

"At the close of the year your company had on its books for construction a greater number of cars than at the beginning."

The general balance sheet follows:

ASSETS	LIABILITIES
Property and plant acct. \$66,782,533	Preferred stock \$30,000,000
Current assets	Common stock 30,000,000
Materials on hand... 19,211,221	Current liabilities—
Accts. and notes recy. 17,713,438	Accts. payable, etc.... 16,225,942
Stocks and bonds of other companies 968,243	Dividends (pay. July 3, 1917) 625,000
Cash 6,017,220	Reserve accounts
\$110,692,655	For insurance 1,000,000
	For gen. overhauling (m. and mainte.) 2,620,748
	For dividends 2,400,000
	For bup. working conditions of emp.... 500,000
	Surplus account 26,820,965
	\$110,692,655

John Sherman Hoyt and W. C. Dickerman have been elected directors of the company, succeeding Thomas H. West and W. N. McMillan, respectively.

TRADE PUBLICATIONS

BOILER KOTE.—The Boiler-Kote Company, Chicago, in a 16-page booklet, details the advantage of using Boiler-Kote in boilers, and shows how it is used to secure the desired results.

Railway Construction

ALABAMA, FLORIDA & SOUTHERN.—W. S. Wilson, vice-president and general manager of this road, has bought a line running from Cowart, Ala., southwest to Cottonwood about 9 miles, and work is now under way on a connection from this line at Cottonwood east to a point on the Alabama, Florida & Southern about 15 miles. A line is also being built from the present southern terminus of the A. F. & S. at Malone, Fla., south to Greenwood, 6 miles. These new lines will be completed by October 15, and will then be sold to the Alabama, Florida & Southern.

ATCHISON, TOPEKA & SANTA FE.—This company has awarded a contract to the Cresmer Manufacturing Company, Riverside, Cal., for the erection of buildings at its car shops at San Bernardino, including a one-story refrigerator car repair shed, 46 by 1,200 ft.; a one-story blacksmith shop, 50 by 385 ft., and a one-story car repair shop, 46 by 310 ft. The cost of these improvements will approximate \$60,000.

CANADIAN PACIFIC.—This company is spending \$75,000 to re-ballast its line between London, Ont., and Windsor. The road will also spend approximately \$185,000 to lengthen sidings and strengthen bridges between London and West Toronto in order that heavier power may be used on this sub-division.

CHICAGO, MILWAUKEE & ST. PAUL.—This company is drawing preliminary plans for a passenger depot at Tacoma, Wash., the construction of which will not be started this year.

CHICAGO, ROCK ISLAND & PACIFIC.—A contract has been awarded by this company to the Railroad Water & Coal Handling Co. for the construction of a wooden coaling station of 500 tons capacity at Trenton, Mo. The road has also let a contract for the building of a reinforced concrete dam at Kingfisher, Okla.

CHICAGO SHORT LINE.—This road, which serves several industries in the Calumet district of Chicago, has purchased land upon which a roundhouse and coaling station will be erected. No detailed information concerning the construction of these improvements is available at this time.

DALLAS-SOUTH WESTERN TRACTION.—This company will construct an interurban line from Dallas, Tex., west to Irving, and then south to Cleburne, a distance of 59 miles. A contract has been let to the Creek Construction Company, Sapulpa, Okla., for the grading, track-laying and bridge work. The road will soon be in the market for ties, rails and equipment. F. R. Perkins, 303 Gaston building, Dallas, is the engineer in charge.

ERIE.—This company is building yard tracks between a point two miles west of Marion, Ohio, and a point four miles west of Marion. The work will involve the realignment of one main track and the building of one 50-ft. single-track bridge; one 50-ft. four-track bridge; one 45-ft. single-track bridge, and one 85-ft. single-track bridge. A contract has been let to the Robert Grace Contracting Company, Pittsburgh, Pa., for the sub-structures. The work on the super-structures will be carried out by the railroad forces. The total estimated cost of the improvements is \$550,000.

GULF, COLORADO & SANTA FE.—This company, in conjunction with the Southern Pacific Lines, the Galveston & Houston (electric) and the county have awarded a contract to the Larkin & Sangster Company, Buffalo, N. Y., for the construction of concrete arch extensions to be built on both ends of the present Galveston (Tex.) causeway. The total length of the new construction will be about 5,900 ft. From the Galveston end it will cover 2,240 ft., and from the main land at Virginia Point 3,600 ft. The section of the arches, including the draw-bridge, that withstood the storm is 2,446 ft. long. There will be 51 new arches on the main land end, and 28 new arches on the Island of Galveston end, a total of 79 arches, each having a span of 60 ft. The arches will rest on piers supported by concrete piles driven into the clay. The Concrete Steel Engineering Company, New York, which designed the arch portion

of the original causeway that weathered the storm successfully, has been retained to design the extensions. The total cost of the work is not to exceed \$1,725,000.

GULF, PLAINVILLE & NORTHERN.—This company will build a line from Great Bend, Kan., north to Hoisington, Galacia, Hays City, Plainville, Wester, Edmund and Norton, approximately 150 miles. It will also build a branch line from Plainville northeast to Laton, Covert and Osborne, approximately 50 miles. A contract has been let to the Imperial Promotion & Construction Company, Osborne, Kan., who will buy all equipment, and do all sub-letting. Work on grading will commence about June 15.

ILLINOIS CENTRAL.—This company has let a contract to L. J. Smith Contracting Company, Kansas City, Mo., for the construction of a line from Dawson Springs, Ky., to Providence, a distance of 17½ miles. About 600,000 yd. of grading will be necessary, a large portion of which is rock. A contract has also been awarded to the Walsh Construction Company, Davenport, Iowa, for grade reduction and line revision on the road between Scottsburg, Ky., and Dawson Springs, a distance of 11½ miles. The work will involve 700,000 yd. of grading, a large portion of which is rock, and also the construction of a 75-ft. span and approach trestle over the Tradewater river.

MEXICAN ROADS.—J. W. McRae, of Joliet, Ill., owner of a timber tract of 75,000 acres situated in the Sierra Madre mountains of Mexico, about 40 miles southeast of Douglas, Ariz., proposes to build a railroad from Douglas to the scene of the proposed lumbering operations. Mr. McRae expects to find a market for his lumber at the mines and other industries of Arizona and New Mexico.

NORTHERN PACIFIC.—This company is enlarging its division yards at Livingston, Mont., by adding five miles of additional tracks. The increase of the yard necessitates the abandonment of the present storeroom facilities and the construction of a new two-story storehouse 50 by 200 ft., a storehouse platform 70 by 500 ft., and a reinforced concrete oil house 30 by 50 ft. The track work, together with store facilities and other changes, will cost approximately \$110,000. The work is being done by company forces, and is to be completed by September 1.

PENNSYLVANIA LINES WEST.—This company will build an addition to its shops at Columbus, Ohio, consisting of a tank shop, a machine shop, a boiler shop, and a flue shop. The tank shop will be 40 ft. high, 95 ft. wide and 300 ft. long; the machine shop, 60 ft. high, 100 ft. wide and 220 ft. long; the boiler shop, 40 ft. high, 143 ft. wide and 170 ft. long; and the flue shop, 20 ft. high, 83 ft. wide and 108 ft. long. The buildings will be of brick and steel construction, and the cost, including equipment, will be approximately \$1,000,000. Work will not be started until fall.

PENNSYLVANIA RAILROAD.—This company is now building a tank and cab shop at Juniata shops, Altoona, Pa. It is to be a one-story building, 82 ft. by 300 ft., of structural steel and brick construction. The work is being done by the railroad company's forces, the structural steel work having been ordered from L. F. Shoemaker, Pottstown, Pa.

This company has given a contract to A. L. Anderson & Bros., Altoona, Pa., to build about 9 miles of line along Ten-Mile Creek from Champion, Pa. (formerly Besco), southwest towards Waynesburg, to a point just below Jefferson.

PHILADELPHIA & READING.—Plans have been completed for a bridge to be built on Greenwood avenue over the P. & R. tracks at Hopewell, N. J. It is to be a through plate girder highway bridge, with concrete floor paved with asphalt, with a clear width of roadway of 24 ft. and two sidewalks 7 ft. each. The bridge will span four tracks, and the work will be done under the grading and masonry contract with John A. Kelley & Co., which was awarded over a year ago.

VIRGINIAN RAILWAY.—Contracts have been let to the Rinehart & Dennis Company, Charlottesville, Va., for the grading, and to the Virginia Bridge & Iron Company, Roanoke, Va., for steel bridges in connection with double tracking work now under construction, from Bud, W. Va., Mile Post, 371.5, easterly 5 miles. The maximum grade will be 2.07 per cent and the maximum curvature 12 degrees. There will be three steel bridges to have a total length of 1,125 ft. The track laying will be carried out by the railroad company.

Railway Financial News

BOSTON & MAINE.—The \$100,000 first mortgage 4½ per cent bonds of the Peterborough & Hillsborough, a subsidiary of the Boston & Maine, which matured July 1, were technically extended for two years under authority of the United States District Court at Boston. Receiver Hustis of the Boston & Maine was given authority to purchase and hold in the treasury such of these bonds as holders desired to turn in.

CANADIAN NORTHERN.—Wm. A. Read & Co. have sold an issue of \$2,700,000 Canadian Northern one-year secured gold notes. These are to refund an issue of \$3,000,000 notes coming due July 10, and will have the same collateral as under that issue, consisting of first mortgage bonds of the Canadian Northern Railway, guaranteed as to principal and interest either by the Dominion of Canada or the Canadian Provincial governments.

PETERBOROUGH & HILLSBOROUGH.—See Boston & Maine.

TENNESSEE CENTRAL.—At the fourth attempt to sell this road on July 2, no bids were received, and the sale was adjourned until October 22. Judge Sanford, of the U. S. Circuit Court at Knoxville, Tenn., has appointed H. W. Stanley, formerly assistant general manager of the Seaboard Air Line, co-receiver with W. K. McAlister. Mr. Stanley succeeds H. B. Chamberlain, resigned.

TOLEDO, PEORIA & WESTERN.—Judge H. O. Humphrey in the U. S. Circuit Court at Danville, Ill., has appointed E. N. Armstrong receiver. This action was instituted by the Farmers' Loan and Trust Company, of New York City, trustees of the bondholders, on the failure of the railway to pay either interest or principal on the bonds July 1. The company holds \$4,895,000 first mortgage bonds against the railway. The bondholders' committee, consisting of Thomas Denny, Adrian Iselin and Henry K. McHarg, have requested holders of the above-named issue to deposit their bonds with the Farmers' Loan and Trust Company in order that protective measures may be taken by it.

WHEELING & LAKE ERIE.—At a meeting of the board of directors, Carl K. Gray, president of the Western Maryland, was elected chairman of the board, succeeding L. F. Loree, resigned. M. C. Byers and Bertram Cutler were elected directors to succeed H. H. Porter and Johnston De Forrest, resigned.

GERMAN RAILWAYS IN CHINA.—Germany has constructed two railways in China, the Shantung Railway and the northern section of the Tientsin-Pukow Railway, both of which are in the province of Shantung. The first is 284 miles in length, and was built with German capital for a German company, and opened for traffic in 1904. It connects the once-German port of Tsingtau with the capital of Shantung, province Tsinanfu.

SWEDISH RAILWAY DIFFICULTIES.—In order to secure the fullest possible utilization of its rolling stock, a special transport bureau has been set up in Sweden. The duties of this bureau are to allocate cars to consignees, and it has the power to prohibit the supply of cars to persons and firms who have not obtained its official authorization. Special arrangements have also been made to insure the best use being made of the locomotive stock, and to this end a system of close co-operation between the mechanical and operating departments has been introduced. The State Railways administration has also demanded Parliamentary sanction to spend £90,000 (\$4,665,600) for acquiring 60 locomotives and 600 freight cars. But, as in the case of the French and German railways, the Swedish administration has discovered that there is a great difference between giving orders and accepting delivery. Another Swedish difficulty is the serious coal shortage. Drastic remedies have had to be adopted to cope with all these handicaps. There have been temporary suspensions of freight traffic on the State lines, and passenger train-mileage, which was recently reduced by 12,750 km. (7,923 miles) a day, is being cut down still further. The company-owned lines have been asked by the Government to adopt similar measures.

Railway Officers

Executive, Financial, Legal and Accounting

H. G. Kelley, vice-president of the Grand Trunk, has assumed the duties of E. J. Chamberlin, president, who has been granted a three months' leave of absence.

E. D. Hogan, general manager of the Gulf, Mobile & Northern at Laurel, Miss., has been appointed vice-president and general manager, with headquarters at Laurel.

Herbert R. Wheeler has been appointed assistant treasurer of the St. Johnsbury & Lake Champlain, with office at Boston, Mass., vice Charles H. Nowell, resigned.

Marcus L. Bell, general solicitor for the Chicago, Rock Island & Pacific, with headquarters at Chicago, has been elected general counsel, with the same headquarters. Mr. Bell was born at Pine Bluff, Ark., on January 11, 1880, and received his education at the University of Arkansas and the University of Chicago, graduating from the latter school in 1903. He entered railway service on June 27, 1904, as private secretary to the chairman of the executive committee of the Chicago, Rock Island & Pacific, with headquarters at New York. On January 1, 1905, he was promoted to assistant attorney at Chicago, and on November 1, 1906, became local attorney at the same place. On August 1, 1909, he was appointed assistant general attorney, and on April 1, 1910, was promoted to general attorney. On May 1, 1914, he became general solicitor, which position he held until his recent election by the board of directors as general counsel of the same road as above noted.



M. L. Bell

A. G. King, superintendent of the Canton Railroad at Canton, Md., has been appointed vice-president and general manager, and P. B. Luke has been appointed superintendent.

P. L. Fisher, assistant controller of the American Locomotive Company, with headquarters at New York, has been appointed general auditor of the Elgin, Joliet & Eastern, with headquarters at Chicago, succeeding F. W. Sutton, resigned.

Mongin B. Nichols, auditor of traffic of the Central of Georgia at Savannah, Ga., has been appointed auditor; William A. Rooks, auditor of disbursements at Savannah, has been appointed auditor of traffic, and Merle F. Harden, cost accountant at Savannah, has been appointed auditor of disbursements.

E. R. Dickenson, auditor of disbursements of the Denver & Rio Grande at Denver, Col., has been appointed general auditor, vice E. R. Murphy, retired on pension. The office of auditor of disbursements has been abolished, and all communications in connection with that department should in future be addressed to the general auditor.

William B. McKinstry, auditor of the Central of Georgia at Savannah, Ga., has been appointed controller of the Central of Georgia, the Wadley Southern, the Louisville & Wadley, the Sylvania Central and the Ocean Steamship Company, succeeding W. D. Beymer, resigned to go to another company. Mr. McKinstry was born on December 9, 1873, and began railway work in 1888, with the Michigan Central, at Chicago. He subsequently served on the Illinois Central, at Chicago, and in May, 1903, went to the Central of Georgia as a claim investigator.

He later served consecutively as traveling auditor, freight claim agent and then as auditor of the same road, which position he held at the time of his recent appointment as controller, as above noted.

H. W. Stanley, assistant to the chairman of the Commission on Car Service, at Washington, D. C., and formerly assistant to the president of the Seaboard Air Line, has been appointed a receiver of the Tennessee Central, with headquarters at Nashville, Tenn. Mr. Stanley was born on February 13, 1874, at Petersburg, Va., and after a grammar and high school education entered railway service in May, 1890, with the Norfolk & Western. He was consecutively telegraph operator, stenographer and chief clerk, and in 1895 became chief clerk to the superintendent of the Southern at Knoxville, Tenn. In 1897 he became secretary to the general superintendent of the Seaboard Air Line, and was later trainmaster, superintendent, superintendent of transportation, assistant general superintendent, general superintendent of transportation, and assistant general manager. In 1913 he was appointed general manager of the road, and on April 1, 1914, was appointed assistant to the president. He left the Seaboard Air Line on June 1, 1916, to engage in special work for the National Conference Committee of the Railways and the American Railway Association, and for the past several months has been assistant to the chairman of the Commission on Car Service at Washington, D. C.



H. W. Stanley

Charles Allen Goodnow, recently appointed vice-president of the Chicago, Milwaukee & St. Paul, has been in railway service for nearly half a century, and is well known as the man who has been in charge of the greatest railroad electrification project so far undertaken. This work, outlined in considerable detail in the *Railway Age Gazette* of February 2, 1917, is remarkable for the rapid progress made and the results achieved in a relatively short period. The contracts for equipment and material for the first unit of the project, the line between Three Forks, Mont., and Deer Lodge, were awarded in November, 1914. This was the first step in a scheme involving the electrification of 440 miles of main line between Harlowton, Mont., and Avery, Idaho. In November, 1915, overhead construction had been completed for a distance of 200 miles, and the 100,000-volt transmission line, which was erected by the railroad on its own right of way, had been completed for an equal distance, and the lines from the Montana Power Company were ready for service. The first of forty-two 282-ton electric locomotives was placed on a test track in September, 1915, and in February, 1917, steam engines were removed from the entire electrified section. A second section of line from Othello, Wash., to Seattle and Tacoma, is now being electrified, and will be ready for operation about the first of next year. Mr. Goodnow also constructed the Gallatin Valley



C. A. Goodnow

Railway, a subsidiary of the St. Paul, which runs from Three Forks, Mont., to Bozeman, and is now president of that line. In connection with the Puget Sound extension of the St. Paul, he supervised the construction of export terminal facilities at Seattle and Tacoma. Among the other interesting features of his active career were the making of the first time-table for operation through the Hoosac tunnel, the installation of the first interlocking plant in New England, at a point called Vermont; the introduction of two English staff machines for the protection of train movements over the Mississippi river bridge at Savanna, the perfection of the manual block system as now in use on the St. Paul, and the introduction of the floating system of handling freight on Puget Sound, which has since grown to important proportions. Mr. Goodnow was born at Baldwinville, Mass., on December 22, 1853. He entered railway service in 1868 with the Vermont & Massachusetts as a telegraph operator, and by steady application and native ability has won his way to the present executive position. In 1875 he became train despatcher of the Troy & Greenfield, and four years later was made trainmaster on the same road. From 1881 to 1886 he was superintendent of the New Haven & Frampton, and in the latter year went to the Chicago, Milwaukee & St. Paul as superintendent of construction. In 1888 he was promoted to division superintendent, with headquarters at Dubuque, Ia., and then served at Marion, and later was assistant general superintendent and general superintendent of the same road. In April, 1902, he was appointed general manager of the Chicago, Rock Island & Pacific, and in November, 1903, became general manager of the Chicago & Alton. From January 1, 1908, to January 1, 1913, he was assistant to the president of the Chicago, Milwaukee & Puget Sound, and on the latter date became assistant to the president of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, which position he held until his recent appointment as vice-president.

Operating

O. H. Hagerman has been appointed manager of the marine department of the Philadelphia & Reading, with office at Philadelphia, Pa.

J. J. McDonell has been appointed chief despatcher on the Saskatoon division of the Canadian Pacific, with headquarters at Saskatoon, Sask.

H. J. Councilman has been appointed trainmaster of the Lake Superior division of the Northern Pacific, with headquarters at Ironton, Minn., effective July 1.

H. C. White has been appointed trainmaster of the 25th district of the Grand Trunk, with headquarters at Battle Creek, Mich., vice H. E. Bailes, transferred.

R. E. Casey, trainmaster of the Grand Rapids & Indiana at Ft. Wayne, Ind., has been appointed superintendent of the Northern division, with office at Grand Rapids, Mich., vice J. W. Hunter, deceased.

C. F. Strickland, freight agent on the Texas & New Orleans, with headquarters at Beaumont, Tex., has been appointed assistant superintendent with the same headquarters, succeeding A. L. Kuykendall, who has been transferred to Jacksonville, Tex.

D. S. Colby has been appointed trainmaster on the Dakota division of the Northern Pacific, with headquarters at Jamestown, N. Dak., and B. B. Johnson has been appointed terminal trainmaster on the Pasco division, with headquarters at Pasco, Wash.

C. B. Anderson, local agent of the Chicago & Eastern Illinois at Chicago, has been appointed superintendent of transportation, succeeding E. H. De Groot, Jr., resigned to become head of the newly organized division of car service of the Interstate Commerce Commission.

P. W. Sullivan, chief clerk to the general superintendent of the central system of the Pennsylvania, Lines West, has been appointed superintendent of the Akron division, with headquarters at Akron, Ohio, succeeding Nettleton Neff, furloughed for military service.

F. A. Leith, assistant superintendent of the Chicago, Terre Haute & Southeastern, with headquarters at Terre Haute, Ind., has been appointed superintendent, with headquarters at West

Clinton; C. D. Lynch has been appointed assistant superintendent, with headquarters at Bedford, Ind., and E. C. Sappenfield has been appointed chief train despatcher, with headquarters at Terre Haute.

E. M. Alvord has been appointed general superintendent of the Pittsburgh & West Virginia and the West Side Belt, with office at Pittsburgh, Pa., and the office of J. G. Code, general manager, has been abolished. Mr. Alvord was in the service of the Missouri, Kansas & Texas System from 1891 to 1910, first as superintendent of various divisions, and then during the last seven years as general superintendent, of the Northern lines. From 1910 to 1912 he served as vice-president and general manager of the Midland Valley, and then was engaged in private business, until his appointment on July 1 as general superintendent of the Pittsburgh & West Virginia, and the West Side Belt.

J. T. Gillick, who has been appointed assistant general manager of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, as has already been announced in the *Railway Age*

Gazette of July 6, was born at Glencoe, Minn., in June, 1870. He entered railway service with the Chicago, Milwaukee & St. Paul in 1885, and was successively telegraph operator and train despatcher until 1903. In the latter year he was promoted to trainmaster, and three years later was appointed superintendent. In 1913 he became assistant to the general manager, with headquarters at Chicago, which position he held at the time of his recent appointment as assistant general manager, as already noted.



J. T. Gillick

E. H. Martin, assistant superintendent on the Canadian Government Railways, with headquarters at New Glasgow, N. S., has been appointed superintendent with the same headquarters, succeeding L. S. Brown, promoted. W. A. Cowan, division engineer of the Transcontinental division, with headquarters at Cochrane, Ont., has been appointed general superintendent, with the same headquarters. K. Stewart, chief despatcher at New Glasgow, has been appointed assistant superintendent, with the same headquarters. L. S. Brown, superintendent, with headquarters at New Glasgow, has been appointed assistant general superintendent of the eastern lines, with headquarters at Moncton, N. B. J. H. Duff has been appointed assistant superintendent with headquarters at Grant, Ont.

F. E. Sanborn, superintendent of the Portland division of the Maine Central, at Portland, Me., has been appointed general superintendent, in charge of the transportation and car service departments, with office at Portland; F. J. Runey, superintendent of the South Mountain division, at Lancaster, N. H., succeeds Mr. Sanborn, and assistant superintendents on the Portland division have been assigned in charge of territory as follows: F. O. Wood, with office at Portland; Lines Portland to Leeds Junction; Leeds Junction to Lewiston Lower and Brunswick; Rockland branch; Brunswick yard and Brunswick to Royal Junction. T. M. McLaughlin, with office at Waterville; Waterville yard and lines Waterville to Bangor; Skowhegan branch; Belfast branch; Foxcroft branch and Harmony branch. G. H. Foster, with office at Waterville; Lines Waterville to Leeds Junction; Kineo branch; Waterville to Brunswick. E. L. Lovejoy, with office at Rumford; Lines Rumford Junction to Kennebago; Canton branch; Farmington to Leeds Junction, including Leeds Junction yard. J. Asnault, assistant superintendent at Calais, has been appointed superintendent of the Mountain division, with office at Lancaster, N. H., vice F. J. Runey, and the office of assistant superintendent at Calais has been abolished. W. A. Wheeler, chief despatcher at Bangor, has been appointed

assistant superintendent of the Eastern division, with office at Bangor and W. E. Kingston has been appointed chief despatcher at Bangor, vice Mr. Wheeler.

C. B. Brown, whose appointment as assistant general manager, Eastern Lines, and chief engineer of all lines of the Canadian Government Railway, with headquarters at Moncton, N. B., has already been announced in these columns, was born on August 27, 1879, at Ithaca, N. Y., and graduated as a civil engineer from Cornell University in 1901. He began railway work later in the same year with the Canadian Pacific, and served consecutively on that road as draftsman and rodman with the division engineer of construction at Trail, B. C.; assistant engineer in the bridge department, at Montreal, in charge of the erection of the Red River bridge at Winnipeg, Man., also the annexes to elevators at Fort William, Ont. From 1902 to 1904 he was resident engineer, District No. 2, Ontario division at London and Toronto, then became assistant division engineer of the Western division at Calgary, Alta. In 1906 he was appointed division engineer of the Atlantic division at St. John, N. B. Two years later he was transferred as division engineer to the Eastern division at Montreal, and from 1912 to 1913 he was principal assistant engineer of the Eastern lines of the same road at Montreal. He then served from 1913 to 1917 as chief engineer of the Canadian Government Railways at Moncton, N. B., and on June 1 was appointed assistant general manager, Eastern Lines, and chief engineer, all lines, of the Canadian Government Railways, with headquarters at Moncton.



C. B. Brown

Traffic

W. L. McMorris has been appointed assistant general passenger agent of the Seaboard Air Line, with office at Norfolk, Va.

A. T. Weldon, assistant general freight agent of the Canadian Government Railways, with headquarters at Moncton, N. B., has been appointed general freight agent with the same headquarters, succeeding D. A. Story, promoted. M. F. Tompkins, division freight agent at Halifax, N. S., has been appointed assistant general freight agent, with headquarters at Moncton, succeeding A. T. Weldon, promoted. A. J. Gray, division freight agent at St. John, N. B., has been appointed assistant general freight agent with the same headquarters. J. H. Norton has been appointed division freight agent with headquarters at Halifax, succeeding M. F. Tompkins, promoted.

Engineering and Rolling Stock

W. R. Meeder has been appointed master mechanic of the Illinois Southern, with office at Sparta, Ill., succeeding W. F. McCarra resigned.

C. D. Rafferty has been appointed master mechanic of the Algoma Central & Hudson Bay, with office at Sault Ste. Marie, Ont., succeeding Thomas Fraser, resigned.

D. J. McCuaig, acting master mechanic of the Grand Trunk at Toronto, Ont., has been appointed master mechanic of the Ontario lines, with headquarters at Toronto.

F. B. Tapley, assistant engineer of the Canadian Government Railways at Moncton, N. B., has been appointed assistant engineer of maintenance, all lines, and will report to the chief engineer.

J. F. Deimling, assistant chief engineer of the Michigan Central at Detroit, Mich., has been appointed acting chief engineer,

vice George H. Webb, who has been commissioned lieutenant colonel in the Sixth Engineer Regiment, National Army. Effective July 1.

Joseph Slutzker, assistant master mechanic of the Pennsylvania Railroad at the Altoona (Pa.) machine shops, has been promoted to assistant engineer of motive power on the Western Pennsylvania division. Leon A. Starkweather, motive power inspector, has been promoted to assistant master mechanic on the New York division; and H. S. Schum, general foreman of the East Altoona enginehouse, has been appointed assistant master mechanic of the Altoona machine shops.

J. C. Beckwith, engineer of construction on the Canadian Government Railways, has been appointed division engineer, with headquarters at Moncton, N. B., succeeding H. T. Ruhl, resigned, to accept service with another company. A. V. Redmond, resident engineer at Cochrane, Ont., has been appointed division engineer with the same headquarters, succeeding W. A. Cowan, promoted. A. H. Willett, assistant division engineer, with headquarters at Cochrane, Ont., has been appointed resident engineer, with the same headquarters, succeeding A. V. Redmond.

F. G. Grimshaw, assistant engineer electrical equipment, Philadelphia Terminal division of the Pennsylvania Railroad, has been promoted to superintendent of motive power of the New Jersey division at New York, succeeding H. H. Maxfield; R. G. Bennett, assistant engineer of motive power of the Central division, succeeds C. D. Barrett as master mechanic at Sunbury; G. H. Watkins, assistant engineer of motive power of the Western Pennsylvania division, succeeds C. S. Gaskill as master mechanic at Orangeville, and J. H. Thomas, assistant general foreman at Pitcairn shop, succeeds F. S. Robbins as assistant master mechanic at Pittsburgh. Messrs. Maxfield, Barrett, Gaskill and Robbins have been granted furloughs to enter military service as officers of the Ninth Engineers, National Army, the railway shop regiment.

W. D. Warren, who has been appointed maintenance engineer of lines east of the New York, New Haven & Hartford, with office at Boston, Mass., as has already been announced in these columns began railway work as chairman and rodman for the Boston & Maine, and later served on the Pennsylvania Railroad. In 1903 he went to the New York, New Haven & Hartford as transitman, and then served consecutively on the New York Central as chief of party and on the Florida East Coast as resident engineer. He returned to the service of the New Haven in 1907 as division engineer of valuation, later becoming division engineer of the Providence division, which position he held at the time of his recent appointment as maintenance engineer of lines east of the same road, as above noted.

Purchasing

J. L. Feemster, storekeeper of the Kansas City Terminal Railway at Kansas City, Mo., has been appointed general storekeeper on the Chicago Great Western, with headquarters at Oelwein, Iowa.

OBITUARY

William P. Cosgrave, formerly superintendent of the Minnesota division of the Chicago & North Western, died at his home at Winona, Minn., on July 4. Mr. Cosgrave despatched the first train on the Chicago extension of the Chicago, Milwaukee & St. Paul, and in 1872 became assistant superintendent of the Chicago division of that road.

Frank J. Martin, assistant general freight agent of the New York, Chicago & St. Louis, with headquarters at Chicago, Ill., died at his home in Chicago on June 4. He was born at Cleveland, Ohio, on December 26, 1865, and entered railway service as a ticket clerk in the auditing department of the New York, Chicago & St. Louis in 1884. Later he was clerk in various capacities in the general freight department until September, 1905, when he was promoted to traveling freight agent. On September 10, 1905, he became agent of the Delaware, Lackawanna & Western at Chicago, and on April 1, 1907, he returned to the New York, Chicago & St. Louis as chief clerk in the general freight department. On September 14, 1909, he was promoted to assistant general freight agent.

Railway Age Gazette

Volume 63

July 20, 1917

No. 3

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We are witnessing the introduction of a new kind of competition in railway passenger service. This is competition in eliminating needless service instead of

A New Kind of Passenger Competition

in adding to it. It is being brought home to the managements of the railways through more channels than one that their most important duty during the war will be to conserve man power and fuel to the utmost extent practicable and to handle the greatest amount of freight practicable. The elimination of passenger service which is not actually needed for the convenience of the public is one of the most effective means available for accomplishing all these objects. Already many railways have made substantial reductions in their passenger service, and now, instead of advertising that they are increasing it, they are giving publicity to the fact that they are reducing it, and pointing the finger of scorn at lines who do not do their part in this direction. Statistics which have been made public indicate that up to the present time in the efforts to conserve fuel and man power the railways as a whole have taken off passenger trains which are effecting a saving equivalent to about 18,500,000 passenger-train-miles a year. This saving is greater than the total passenger train mileage per year of any railway system in the country except five—the New York Central system, the Pennsylvania system, the Santa Fe, the Southern Pacific and the North Western. It is a remarkable fact that in some communities the railways have been criticised for the reductions in passenger service they have made. Such criticisms are most unjust. The fact is the railways are making the reductions very reluctantly, and in many cases the opposition among their own managers has been so strong that it has been practically impossible to effect any at all. For example, some of the worst duplicated service in the United States is between Chicago and St. Louis, Chicago and Kansas City, and Chicago and the Twin Cities, and yet no curtailments have yet been made between these cities. Instead of criticising railways for doing their patriotic duty, even contrary to their inclinations, the public and press would much better commend those railway manage-

ments which in recognition of the national emergency are taking off service, and condemn those that are standing in the way of the reductions that are needed.

The United States Government has this last week ordered for service in France 300 80-ton Consolidation locomotives,

Big Equipment Purchases by Governments

150 each from the two largest locomotive builders. This news will cap the climax on the fact that cars and locomotives have now become so high in price that almost the only people that can buy them are the governments of the United States, Great Britain, Russia, France and Canada. On another page of this issue are given some interesting figures, adapted from a table in the appendix to the Interstate Commerce Commission's decision in the Fifteen Per Cent Case, showing that the railways of this country are now paying from 50 to 100 per cent more for their cars and locomotives than they did a year or so ago. In the same article it is also shown that of the total purchases of 1,175 locomotives and 24,635 freight cars received by equipment builders since June 1, 1,014 locomotives and 8,435 cars were ordered by governments. In connection with this article three things should be emphasized. One is that the railways cannot buy freight cars at the present high prices. Another is that the recent big purchases of locomotives this year, that is up to June 1, indicate a realization of the necessity for larger trainloads and heavy and efficient power. No road would be willing to pay as high as \$100,000 for a Mallet, \$70,000 for a Santa Fe or \$35,000 for an eight-wheel switching locomotive if it did not expect to make the most of it as an economic transportation unit. The third point is that relating to government purchases. It appears for the moment as if the railways were losing out completely in the competition for space in the car and locomotive plants. The Russian government has just ordered 500 one-hundred ton locomotives at a price stated to be \$56,000 each; the British government will pay \$45,000 apiece, it is said, for its 100 Consolidation locomotives. The Canadian government will pay about

\$2,600 each for 5,000 box cars, and the end is not yet. Both Russia and France want to buy more locomotives and cars. Both the large locomotive plants are filled up with orders for over a year ahead. Where the railroads that have not locomotives now on order, are going to fit in, is a question.

THE INTERSTATE COMMERCE COMMISSION AND CAR SERVICE

IN an editorial in last week's issue it was suggested that a strong recommendation made by the Interstate Commerce Commission to shippers and receivers of freight that they co-operate with the railroads in their efforts toward getting heavier car loading would be of immense value. It now appears that at just about the time the *Railway Age Gazette* was going to press the Commission was doing that very thing. In its announcement of the organization of a Division on Car Service, of which we were able to publish only the principal facts last week, the Commission not only indicated that the new division proposed to co-operate as far as practicable with the work of the Railroads' Commission on Car Service, but it also issued a recommendation to shippers and receivers regarding heavier loading of cars.

The Commission said: "It is expected that shippers and receivers of freight will to the fullest extent aid in promoting car service by promptly loading and unloading carload shipments, by capacity loading, where possible, regardless of carload minimum, by readily adapting themselves to such modifications in the handling of less-than-carload shipments as may be found necessary, and by hearty co-operation in the other methods which have been or may be devised to meet the transportation problems confronting the country."

The editorial in question was in error in stating that the Commission "so far as we know, has never made an appeal for the full use of car space" in the circulars issued jointly to carriers and shippers which the Commission has usually issued at times of threatened car shortage. An examination of our files shows that the *Railway Age Gazette* has on at least two occasions published circulars issued by the commission urging not only prompt loading and unloading of cars and prompt movement of freight, but also full loading. Moreover, since the campaign for intensive loading and conservation of transportation in general was inaugurated by the Railroads' War Board, the Commission has co-operated most heartily in the efforts of the railroads, just as a very large number of shippers have, generally, since the matter has been placed on a patriotic basis and it has been evident that both the nation's war preparations and its business would suffer unless all join in promoting the greatest possible efficiency of the available transportation facilities.

In the article in our recent Patriotic War Number describing the work of the Commission on Car Service, attention was called to the fact that the representatives of the Interstate Commerce Commission who have been meeting with the railroads' commission had made it a practice, in replying to complaints from shippers about car shortage, to insert an argument for capacity loading and the need for prompt release of cars; and the importance of the subject has been brought strongly to the attention of shippers and consignees on many occasions.

This paper has frequently criticized the attitude of the Interstate Commerce Commission in the matter of rates because of a belief that a more liberal policy would have placed the railroads in a better position to cope with the enhanced demands on their facilities, but we do not wish to be understood as failing to appreciate what the Commission has done during the prevalence of acute conditions of car shortage and congestion during the past winter and spring. It readily consented to the railroads' request to be allowed to increase demurrage rates and has given valuable

support to the work of the Commission on Car Service ever since it went to Washington.

The Commission's announcement regarding the Division of Car Service also gives an indication of its intention to continue to work with the roads; and the selection of such an experienced railroad transportation officer as E. H. De Groot, Jr., until recently superintendent of transportation of the Chicago & Eastern Illinois, as chief of the division, should inspire a feeling of confidence in the results to be expected from its establishment.

There has been much speculation as to what the Interstate Commerce Commission intended to do under its new authority over car service, conferred by the Esch-Pomerene law, and as to the effect of its action on the work of the Commission on Car Service. The Commission on Car Service has been given very broad powers over car distribution since the organization of the Railroads' War Board, but the announcement by the Interstate Commerce Commission on July 12 indicates at least the intention that there shall be no unnecessary conflict of authority. Under the new law the power of the commission is, of course, supreme, but that does not necessarily imply interference with the work being done by the railroads themselves as long as the latter are able to manage their own affairs properly. The Commission announces that through the new division it will regulate car service, and when occasion requires it will issue orders or directions direct to the carrier or carriers concerned, but that subject to this fundamental principle it will, as far as practicable, avail itself of co-operative effort on the part of the railroad Commission. The announcement calls attention to the extensive organization of the Commission on Car Service, with its seven members, all superintendents of transportation of different railroads which territorially cover practically the entire United States, and the large force of assistants under its control in Washington and in the field.

Complaints and communications regarding car service received by the Commission will be handled through the new division and the field service will be developed as occasion may require.

Under the law the Commission may require the carriers to file their car service rules as tariffs, it may establish its own rules, on complaint or on its own initiative, and whenever it shall be of opinion that necessity exists for immediate action, it may suspend the existing rules and issue "such just and reasonable directions with respect to car service as in its opinion will best promote car service in the interest of the public and the commerce of the people."

All these things are not required to be done, however, unless it is necessary, and it should be possible to effect a degree of co-operation between the Division of Car Service and the Commission on Car Service which will have very satisfactory results. The Interstate Commerce Commission will naturally seek to protect the interests of the shippers in case it considers that the railroad committee in any case has failed to give them proper consideration, and on the other hand it will be in a position to support the attitude of the railroad committee on some occasions.

The Commission also suggests co-operation between the local committees representing the railroads and those representing the shippers, appointed by the National Industrial Traffic League, stating that where irreconcilable differences arise they may be referred either to the carriers' commission or to the Division of Car Service for adjustment. This apparently indicates a purpose on the part of the Commission to act as a court of appeal rather than to actively regulate the distribution of cars itself; and the idea of co-operation is further carried out by the arrangement by which the Commission has secured temporarily for this work the services of H. C. Barlow, traffic director of the Chicago Association of Commerce and chairman of the executive committee of the National Industrial Traffic League. As at present con-

stituted the division will, therefore, consist of a railroad man, a representative of the shippers, who is an ex-railroad officer of long experience, and A. G. Gutheim, one of the commission's most experienced examiner-attorneys; and the arrangement seems admirably adapted to bringing about the degree of harmony between railroads, shippers and the commission which the occasion so imperatively requires.

COURTESY—A WAR TIME NECESSITY

"I DON'T know who did it," he remarked, "but, honestly, I could hardly believe my eyes. I went over to get the 5:15 the other night, and will you believe me if I tell you that as I walked down along the train, I saw that every window in every car was opened slightly from the bottom; and no one had to fuss and get hot under the collar, the way they sometimes do, trying to open windows to get the air." It is somewhat hard to believe, and it does not necessarily follow that it would be a practical method to follow generally. We do know, however, where the railway that runs that particular 5:15 will find another man who has a kindly feeling towards it.

The railways at present are in a very difficult position, trying to reduce passenger service that they may better handle their more necessary war-time freight traffic, reducing portions in dining cars, getting after shippers to load their freight more heavily and to unload it more promptly and at the same time doing their best to explain deliveries delayed because of congestion and lack of cars. Thus far, as a general thing, the public considers that it has been treated remarkably well, even under the adverse conditions. The public knows that the railways are up against a big proposition. The favorable attitude with which the man in the street has regarded the prompt measures taken to co-ordinate the railways through the Railroads' War Board is a subject of comment. A satisfied public is an asset of great value, and the railways certainly have a great deal to be thankful for in that they have succeeded in encouraging the friendship of their "constituents" at a time like this.

It showed, for example, in the Fifteen Per Cent Case. The commission, to be sure, did not give as much heed to the fact as perhaps it should have, but it surely was considerably impressed by the friendly feeling on the part of shippers and the relative absence of protests against the increases. "These facts are not without significance in so far as they indicate the existing state of the public mind," says the majority opinion. "It may be admitted that facts of this character reflected in the record indicate a somewhat different state of public opinion from that which has heretofore prevailed in connection with similar issues before us."

The railroads are now in the advantageous position where they have the public on their side. Their efforts should be directed to keeping it there.

Let us take a leaf from Europe's experience. Transportation of commercial traffic in the warring countries overseas has not been quite what it should be. Our European correspondent has commented on that again and again. Not once has he failed to draw attention to the fact that the railways are the ones who always get the blame, although in a great many cases conditions at the front, the rulings of the civil authorities and such things, are at fault. In other words, it is easy to blame the railways because they are the nearest things to hand. We do not presume that the American railways are going to be able to render 100 per cent perfect service for the duration of the war. We do know that if the public is treated right it will be more willing to understand that 100 per cent perfect service is not possible in time of war, and it will be more likely to believe that the railways are doing their level best to give the forces in the field and the public at home the best that is in them.

In other words, do not let the strain of war conditions allow us to forget the necessity for courtesy. Emphasize courtesy and fair dealing more than ever so that the new employees—the women, for instance—who take the places of those who join the colors may understand that the good opinion of the public is the thing that counts. And prop up some of the weak points that still exist. Do not emphasize the value of courtesy to your patrons, and then let trainmen insult passengers and freight clerks ruffle the temper of consignees. Do not count on polite train crews alone and then let a surly gateman shut a gate in a passenger's face and cut off his nose almost, and his friendship entirely in the same second. War-time is a time of strain. It is not over-conducive to good temper, and anything that can be done to encourage courtesy and the good feeling of the public towards the railroads is going to be repaid a thousand-fold.

THE FARMER AND THE RAILROADS

THE Interstate Commerce Commission is not a political body. At the same time, it is not, as many persons sometimes say, a judicial body. It is an administrative body created by Congress to perform certain functions delegated to it by Congress, and if it does not perform them to suit its creator, Congress can pass legislation to control its acts, or, indeed, entirely to abolish it.

There is a widespread belief in Washington that the dependence of the Commission on the favor of Congress and the attitude assumed by a number of senators and representatives, were very influential, if not actually controlling, factors, in determining the Commission's decision in the 15 per cent rate case. There were thought to be strong indications in the attitude of the majority of the members of the Commission during the hearings, as there are also in the majority opinion, that they believed the railroads needed larger advances than those granted. Furthermore, practically all classes of shippers in the country, except those in the agricultural communities, favored greater advances than were allowed. On the other hand, the farmers, especially of the middle west, apparently were opposed to any increase of rates. They were the only large interest that appeared by counsel vigorously to oppose any advance. The attitude of the farmers was reflected in that of the senators and representatives from many agricultural districts, especially those of the middle west. Resolutions of various kinds regarding the advances asked for were introduced in Congress. Some of them proposed the prohibition of the advance asked for and others even went so far as to suggest the abolition of the Interstate Commerce Commission.

It is a remarkable fact that while the prejudice and antagonism to the railways which were almost universal ten years ago no longer exist among the business men of the country, they still prevail, and apparently without much diminution, among the farmers, especially of the middle west. This deep-seated antagonism on the part of the farmers is the greatest obstacle to fair treatment of the railways and to the solution of the railway problem. Why should this be the case? The prices of all farm products have greatly increased while railway rates have stood practically still. At the same time the farmer has become one of the greatest sufferers from shortages of cars and congestions of traffic resulting from the fact that the railways have been unable adequately to increase their facilities. It would seem, therefore, that the farmers are not only as able as any other class of the public to pay higher rates, but that it is as much to their interest to do so as to that of any other class.

It is often said that while the prices which consumers have to pay for agricultural products have increased greatly, the farmers have not received the benefit of these increases.

Official statistics on the subject demonstrate the incorrectness of this contention. The Statistical Abstract of the United States shows that between 1910 and 1916 the farm values of the most important agricultural products increased as follows: Wheat, from 88.3 cents per bushel to \$1.00, or $81\frac{1}{2}$ per cent; corn, from 48 cents to 88.9 cents, or 85 per cent; oats, from 34.4 cents to 52.4 cents, or 52 per cent; barley, from 57.8 cents to 88.2 cents, or 53 per cent; rye, from $71\frac{1}{2}$ cents to \$1.22, or 70.6 per cent; buckwheat, from 66 cents to \$1.13, or 70.8 per cent; potatoes, from 55.7 cents to \$1.46, or 162 per cent.

Meantime, railway rates almost stood still. In consequence, whereas in 1910 the freight rate on a bushel of wheat from Chicago to New York was 11 per cent of the farm value of the wheat, in 1916 it was only 6.3 per cent of the farm value of the wheat. Likewise, while in 1910 the freight rate on a bushel of corn from Chicago to New York was 18.6 per cent of the farm value of the corn, in 1916 the rate from Chicago to New York was only 10 $\frac{1}{2}$ per cent of the farm value of the corn.

How much the farm values of agricultural products have increased relatively to the rates which the railways receive is strikingly illustrated by the increases which have taken place in the number of ton-miles and passenger-miles of transportation which can be bought with a given quantity of any farm product. For example, in 1910 a bushel of corn at the average farm value would buy 63 ton-miles of transportation, while in 1916 it would buy 126 ton-miles, an increase of exactly 100 per cent. Likewise, in 1910, a bushel of wheat at the average farm value would buy 117 ton-miles of transportation, while in 1916 it would buy 227 ton-miles, or an increase of 94 per cent. Even more remarkable are the relative changes in the farm value of potatoes and in the average railway rates. In 1910 a bushel of potatoes at the average farm value would buy 74 ton-miles of transportation, while in 1916 it would buy 207 ton-miles, an increase of 166 per cent. Certainly with such increases as have occurred in the prices that the farmer receives he has become able to pay much higher rates than he is now paying.

Furthermore, it would be to his interest to pay higher rates. Good and adequate service is more important to him as well as to all other shippers than the lowest rates that can possibly be obtained. Now, as a matter of fact, the farmer, like other shippers, has not within recent years been receiving adequate service. Why? Because the railways have not been able to increase their facilities as fast as the demands for transportation have increased. They have been unable to increase their facilities sufficiently because, excepting in the abnormal year 1916, their net return has shown a steadily downward tendency and this downward tendency has been due to the fact that they have been unable to secure increases of rates to offset the increases in their expenses. Finally, their inability to secure reasonable advances in rates has been chiefly due to opposition which has come, not only in the 15 per cent case, but in earlier rate advance cases, from the agricultural districts, and especially from those in the middle west.

In thus opposing all advances in freight rates regardless of the great changes which have been and still are taking place in the transportation field, the farmer is injuring himself more than anybody else. He is losing, and will continue to lose, much more money because he cannot get enough cars in which to ship his products when he wants to ship them than he has gained or can gain by freight rates which are so low as to disable the railways from providing sufficient facilities. If the farmer would study the facts about the transportation situation himself and act accordingly, instead of accepting the cooked-up statistics which are furnished to him by a lot of professional agitators against railways and allowing his attitude to be determined by these agitators, the results for all concerned would be much better.

CHICAGO, ROCK ISLAND & PACIFIC

IN April, 1915, when the Chicago, Rock Island & Pacific was put into the hands of receivers at the instance of some of its own board of directors, the proceeding was criticized by N. L. Amster and others as being entirely unnecessary. On the other hand, the controlling interests of the old management claimed that the receivership was inevitable. Now, after two years of operation under the receiver, it has been found possible to reorganize the company without foreclosure, raise enough cash to pay off receivers' debts and unfunded debts of the company, and make a showing of earnings which justify reasonable expectation of dividends on the new preferred stock which was issued to raise the necessary money for the reorganization.

What has happened? Was it some fault of the old management which prevented the property from earning what it was capable of earning, or have railroad conditions changed so for the better as to account for this great change in the prospects of the Chicago, Rock Island & Pacific, or have conditions affecting this particular road changed for the better to a greater extent than on the majority of other roads?

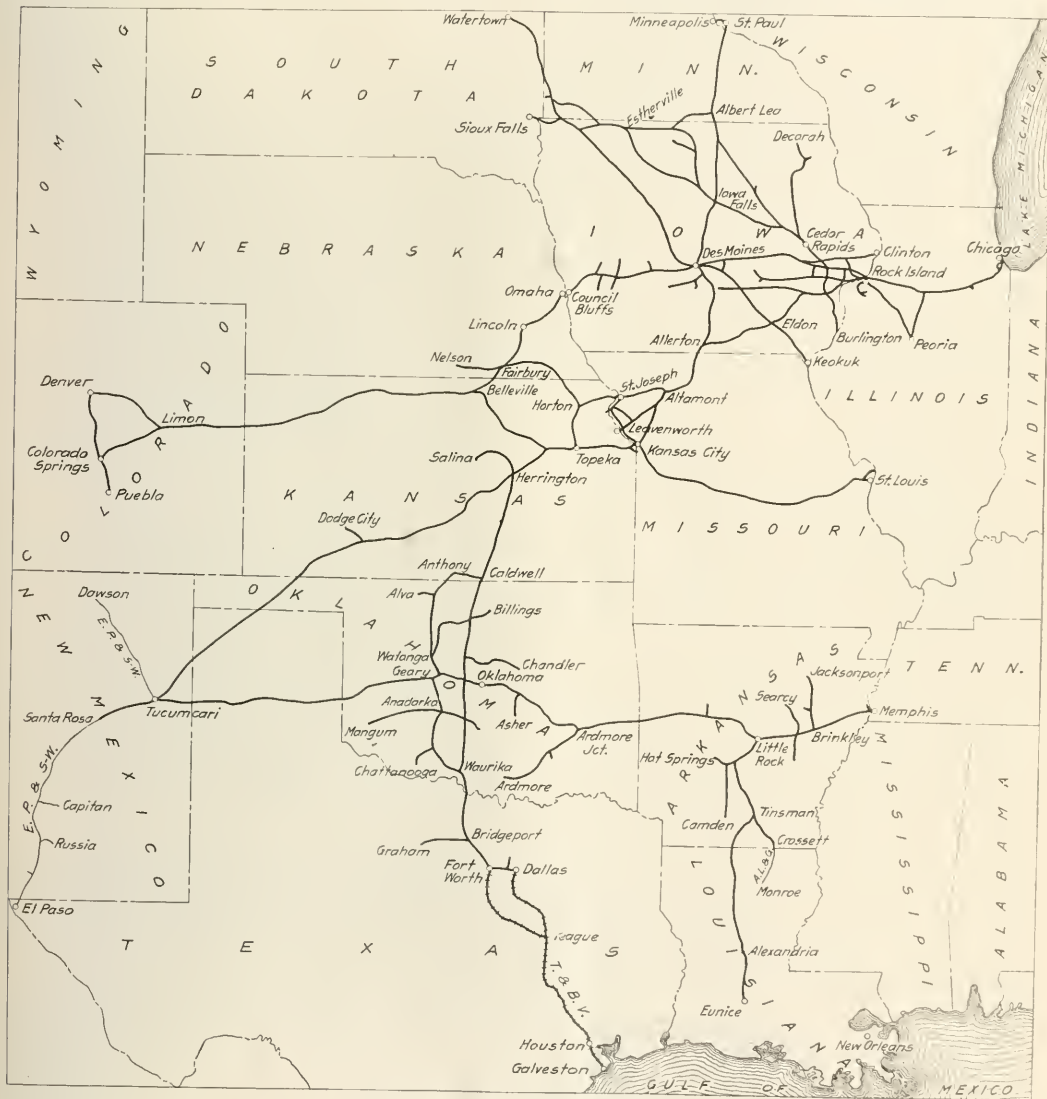
The Rock Island got down to low ebb in the fiscal year ended June 30, 1915. After making charges for interest due there was a deficit for that year of \$735,000, and besides this there was an additional \$870,000 which the accountants who examined the Rock Island's books thought should have been charged for depreciation of equipment in addition to what was charged for depreciation. This would have made a deficit in the neighborhood of \$1,600,000. In the calendar year ended December 31, 1916, after making deductions for approximately the same amount of interest as in 1915, there was a surplus of \$8,078,000, although in the opinion of the accountants large enough depreciation charges are not yet being made. Comparing the calendar year 1916 with the fiscal year ended June 30, 1915, gives the most striking contrasts, but there is a great enough change between the calendar years 1916 and 1915 to indicate that it was during these two years that the prospects of the road were so radically improved. In the calendar year 1915 there was a deficit, after interest charges, of \$386,000, comparing with the more than eight million dollars surplus for last year.

Total operating revenues in 1916 were \$80,889,000, an increase over 1915 of \$9,590,000. Had it not been for a debit for hire of freight cars in 1916 as against a credit in 1915, making a total difference of \$1,179,000, the Rock Island would have held all of the increase in gross for net income. The question now resolves itself into two, namely, was the increase in gross due to the Rock Island's getting more than its share of the increase in freight and passenger business; and, what were the changes in conditions which made it possible to handle the great increase in business at a comparatively very small increase in expenses? The increase in freight revenue was over 16 per cent, but the increase in ton mileage of revenue freight was over 20 per cent. The increase, however, in the number of tons carried was a little over 13 per cent. It is obvious, therefore, that the Rock Island got a much longer average haul in 1916 than in 1915; the average in 1916 was 249 miles.

Of the total tonnage carried in 1915 32.29 per cent was products of mines, 27.14 per cent products of agriculture, 18.67 per cent manufactures, 8.70 per cent lumber and forest products, 6.86 per cent livestock and animal products, and 6 per cent i.e.l., the remainder being miscellaneous. Interestingly enough the tonnage of every single class of commodities, with the exceptions of dressed meat and anthracite coal, which together form less than two per cent of the total tonnage carried, increased in 1916 as compared with 1915. The tonnage of manufactures shows the greatest increase—21.96 per cent. Products of agriculture come next, with an increase of 12.24 per cent, and products of mines next.

with 12.15 per cent; but products of mines include tonnage of coke and of ores, both of which show abnormal increases—94.80 per cent for coke and 46.59 per cent for ores. Some of the Rock Island's competitors are the Union Pacific; Chicago, Burlington & Quincy; Atchison, Topeka & Santa Fe; Missouri, Kansas & Texas, and St. Louis-San Francisco. Compared with most of these, the Rock Island has not shown an abnormal increase in freight traffic. It

and a slight increase in number of passengers carried, there was an increase of only 2.13 per cent in transportation expenses. For one thing, carloading was materially better. The average number of tons per loaded car was 17.62 in 1916 as against 16.34 in 1915. This, together with an increase in the number of loaded cars per train, brought up the average trainload to 427 tons as compared with 382 tons in 1915. This trainload figure includes company freight



The Chicago, Rock Island & Pacific

seems fair to conclude, therefore, that there was no failure in 1915 to get traffic for the Rock Island that it ought to have had, but that the good showing made in increased gross in 1916 was the result of improvement in general conditions.

As to expenses, however, the case is different. With an increase of over 20 per cent in the ton mileage of freight,

as well as revenue freight. Through the increased trainload it was possible to handle 20 per cent more freight business with only 4 per cent increased freight train mileage.

It will be recalled that transportation expenses increased only a little over two per cent. It is hardly possible that transportation expenses per freight train mile on the Rock Island were less in 1916 than in 1915. There was, how-

ever, a considerable saving made in passenger service. Passenger train miles amounted to 16,916,000 in 1916, a decrease of 1,138,000. This would certainly appear to be a step in the right direction, for even in 1916 there was a greater train mileage of passenger trains run than of freight trains, while the revenue from freight was \$55,000,000, and from passengers, less than \$20,000,000. There was, of course, additional revenue from passenger trains and from mail and express, but even counting these two items in, the contrast would be between \$55,000,000 and a little over \$24,000,000.

During the calendar year \$2,670,000 was spent for additions and betterments, exclusive of equipment. With the exception of 28 freight cars and some work cars, no new equipment was added during the year.

Without attempting to pass any final judgment on the Rock Island situation, it would appear that the Rock Island has the organization and the road to handle at least the business of 1916 on a profitable basis, and if gross earnings continue at their present rate, or better, the reorganization plan has a good chance of working out successfully. Expenses, of course, in 1917 will probably be higher than in 1916, the so-called eight-hour law now being in effect and scarcity of labor forcing up wages of many classes of non-union employees, while there have been great advances in the prices of materials and equipment.

The following table shows the principal figures for operation in the calendar year 1916 as compared with the year 1915:

	1916	1915
Average mileage operated	8,088	8,228
Freight revenue	\$35,141,668	\$47,404,207
Passenger revenue	19,674,370	18,500,032
Total operating revenues	80,889,129	71,299,359
Maintenance of way and structures	10,097,734	9,883,148
Maintenance of equipment	13,168,137	12,298,662
Traffic expenses	1,716,087	1,841,640
Transportation expenses	27,769,887	27,191,120
General expenses	1,968,289	1,860,669
Total operating expenses	55,091,717	53,610,457
Taxes	3,766,294	3,516,012
Operating income	21,992,243	14,140,209
Total income	23,428,685	15,469,676
Net income	8,078,189	*386,383

*Deficit.

NEW BOOKS

The Portland Cement Industry, by William Alden Brown. 514 in 1 by 8 3/4 in. 155 pages, illustrated. Bound in cloth. Published by D. Van Nostrand Company, 25 Park Place, New York. Price \$3.

This book is intended for the producer of Portland cement and others who are interested in the details of its manufacture. The viewpoint is essentially English, but American practice is covered to a considerable extent, particularly as to machinery and equipment. The book contains chapters on general considerations, raw materials, design and construction of plants, kilns, power plants, costs, equipment, cement testing, chemical composition, fineness, strength, time of setting and soundness. The greatest amount of space is devoted to the machinery for crushing and grinding the materials and to the kilns for burning them. Power plants are treated in detail and the chapter of costs gives considerable space to methods for collecting cost data.

Pacific Ports, Third edition, 1917. Edited by Wilford Beaton. Bound in limp leather, 400 pages. Size 5 in. by 8 in. Published by the Terminal Publishing Company, Seattle, Wash. Price \$3.

The title page of this book states that it is a commercial geography, commercial dictionary, transportation guide and marine manual of the Pacific ocean with full information for importers and exporters. The book covers the ports of the Pacific, not only from Alaska to Central and South America, but also in Australia, Japan and the east coast of Asia to Siberia. It gives descriptions of the countries and harbors on the Pacific, details as to the steamer routes and information regarding the harbors, harbor dues, shipping regulations and consular documents required.

Letters to the Editor

PSYCHOLOGY IN THE LOCOMOTIVE CAB

SAN FRANCISCO, Cal.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Letters in the newspapers, especially in the East, where the open-window season seems at last to have arrived, call attention, just now, to noise nuisances of various kinds; and the locomotive whistle, and the troubles which it causes, are once again brought to mind. As some of your correspondents have observed, the slovenly whistler seems to be always with us. He seems to make the blasts of the whistle wholly according to his individual taste, or (more frequently) in a way to show that he has no taste at all. Taste or no taste, the standard signal for road crossings, as prescribed by the American Railway Association, is constantly modified everywhere.

Why not look a bit into what might be called the psychology of the question? In general, the modifications made by these free-minded runners tend towards two long, a short, and one long blast, the last one sustained at will.

The very fact that the modified form of signal tends toward a prolonged last blast, indicates some generally operating reason; and, hence, that possibly an authorized modification of the standard crossing signal in this direction might produce better compliance with the rule than an attempt by discipline to drive the enginemans away from a procedure that apparently is based on some ground more potent than the book of rules.

Perhaps, because the signal is a warning, there arises a desire to emphasize the warning by prolonging the signal, and, carelessly, the last blast is prolonged rather than all, proportionately. This, in turn, suggests the thought that if the signal were reversed so that it would be two short followed by two long blasts, officers in charge of discipline would find it easier to get compliance with the regulations.

It is very easy for railroad managers to decide that certain things are only matters of discipline, and that, therefore, a bulletin or other disciplinary measure may be called upon to produce results; but if the regulation is not directed along common sense lines, the effect is doubly bad, because not only does the regulation break down, but also the discipline following it is merely arbitrary and therefore irritating and ineffective.

ALLEN H. BABCOCK.

SPANISH ROLLING STOCK IN 1916.—According to statistics recently made public, the railroads of Spain possessed at the beginning of 1916 the following rolling stock: 2,683 locomotives, with a capacity of 1,634,520 horsepower; 6,390 passenger cars to accommodate 270,722 persons; and 59,454 freight and cattle cars, with a capacity of 593,540 tons.

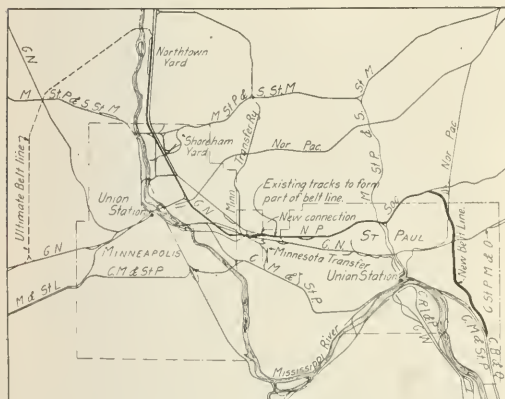
NEW JAPANESE RAILWAY IN MANCHURIA.—Work has been begun on the railway from Ssuningkai to Chengchiatun, in Manchuria, one of the lines granted to Japan for construction under an arrangement concluded between the Chinese government and the Yokohama Specie Bank in October, 1915. The required loan was floated in Japan, and by June, 1916, some \$50,000 had been advanced for survey purposes. The survey was completed in December, 1916. Owing to the present high cost of materials the line is to be built as economically as possible, wooden bridges to be erected temporarily and to be replaced later when the price of steel declines to normal. By the end of this year it is hoped that the road will be open to Sankiangkow from Ssuningkai; and by August, 1918, that it will be completed.

Work Started on New Belt Line Around St. Paul

The Hill Lines Are Undertaking the Construction of a Road Which Will Aid in Handling Interchange Traffic

THE Great Northern, the Northern Pacific and the Chicago, Burlington & Quincy have undertaken the construction of a belt line about St. Paul which will greatly relieve the freight interchange conditions now existing at that point. To carry on this work the Twin City Belt Railway Company has been organized, the stock of which is owned equally by the three roads. The line is intended not only to provide facilities for the interchange of freight between the three owning lines but is also expected

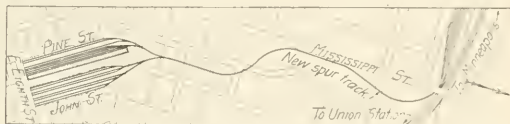
In the plan for the new Union Station prepared two years ago the complete separation of grades at this point was contemplated. The difficulties and the expense involved in this grade separation led to the development of the belt line, which eliminated the necessity for grade separation, and permitted a better trackage arrangement for the Union Depot, as well as reducing the estimated cost of the project about \$4,000,000. The belt line will take over all the business for South St. Paul and practically all of the interchange business. It is also expected that arrangements will be made with the Chicago Great Western for the diversion of its Minneapolis freight over the belt line. The only freight which will then move over the wye will be that of the Omaha from the south and west, and that for the industries and freight houses in the immediate vicinity of the station. This



Map of the Twin City Terminals

to perform the same service for the other roads entering these cities.

Although only the Hill lines are participating in the construction of this belt line it bears a very important relation to the Union station project now being started in which all of the nine roads entering St. Paul are equal owners. The point of greatest congestion in St. Paul is at the wye at the east entrance to the station. Not only do all passenger trains using the tracks of the Great Northern and Northern Pacific to Minneapolis and those of the Burlington,

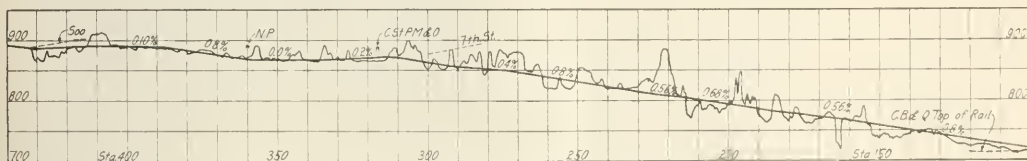


New Freight House and Team Yard at Eighth Street

will greatly relieve the congestion and simplify operation at this point.

The belt line will start from a connection with the Burlington and the St. Paul tracks at Highwood, four miles south of the union station and will swing to the north, crossing under the Chicago line of the Omaha and the Duluth line of the Northern Pacific and connecting with the main line of the Soo to the east near Lake Phalen. From that point trackage rights have been secured over the Soo line for two miles to a connection with the Northern Pacific which line will be used from there to Minnesota transfer, six miles further west. At the latter point a connection nearly a mile long will provide entrance into the Minnesota Transfer yards and a connection with the main line of the Great Northern.

From the connection with the Great Northern at Minnesota Transfer the latter road now has four tracks to its Northtown yards, although at present only two are reserved



Profile of the Belt Line Between the Burlington and the Soo Connections.

the St. Paul, the Rock Island and the Omaha from the south pass over this wye but the trains of the Burlington and the Omaha reverse directions on it. All through freight from Minneapolis handled by the Omaha road for the south west and by the Chicago Great Western, practically all of the business for the stock yards and other industries of South St. Paul and a heavy interchange movement also pass over this wye. As a result the congestion and the consequent delay to freight movements has become increasingly serious in recent years.

for running track. However, this line is being converted into a four track line which will constitute a further development of the belt line. From Northtown yards the belt line has been projected southwest to a connection with the Great Northern main line to Wilmar at Hopkins Junction, crossing the Great Northern line to St. Cloud and the Soo line to the northwest. Only that portion of the line east of Minnesota Transfer yards is under development at present.

Until last year the Great Northern handled most of its

switching at its Cedar Lake yard a short distance east of Hopkins Junction and its Northtown yard adjacent to the general classification yard of the Northern Pacific was used primarily for storage purposes. In 1910 approximately 30 miles of tracks were laid at Northtown and this year an equal mileage will be built in addition to an engine terminal. When the extension of the belt line to Hopkins Junction is built, a complete mechanical terminal will be constructed at Northtown and it will become the main yard of the Great Northern for the Twin Cities.

Traffic of the Burlington, the St. Paul and its tenant, the Rock Island, will be turned over to the belt line in a small yard at Highwood, where several tracks 5,000 ft. long and a small engine house will be located. The St. Paul Bridge & Terminal Company now owns a line extending north from South St. Paul and crossing the Mississippi river a short distance above Highwood. A connection will be built from the north end of this bridge to the belt line, crossing the Burlington and St. Paul tracks overhead and providing an entrance into South St. Paul over which stock and other traffic will move directly without going through the yard at Highwood.

A small set-out yard and a connection will be provided at the crossing of the Omaha line at which interchange will be made with this road. No connection will be provided at the crossing of the Northern Pacific line to Duluth but a wye will be built between this line and the Soo a short distance further north over which freight will be transferred to the belt line. Through these connections a large portion of the business will be interchanged directly between the three owning roads, and the Omaha, the Soo, the Great Western, the St. Paul and the Minneapolis & St. Louis. Interchange with the other roads and the balance of the interchange of all will be made through Minnesota Transfer yard. It is estimated that about 800 cars will be handled daily over this line at the outset.

The new line from Highwood to the connection with the Soo will be built for double track and will be used exclusively for freight traffic. The portion of the Soo line which will be used is now single track and carries only a small amount of freight traffic. This section of the Soo line probably will be double-tracked almost immediately. The Northern Pacific section is double track. It now carries the passenger and freight trains of the Minneapolis & St. Louis and Northern Pacific freight trains. Thus except for a short distance a double track line eventually will be provided.

The difference in elevation between Minneapolis and St. Paul is approximately 215 ft., 167 ft. of which is overcome on the belt line. Starting at the south end the belt line will rise on a 0.3 per cent grade through the interchange yard at Highwood, changing to 0.8 per cent at the north end and continuing at that rate for approximately four miles. Beyond this point the grade will continue to ascend with short sections of 0.8 per cent grade which can be reduced to 0.4 per cent when desired. The maximum curvature is 6 deg.

With three exceptions all grades with streets will be separated. To accomplish this it was necessary to lay the grade line lower than would otherwise have been done, increasing the excavation materially. Ten over crossings are provided with 32-ft. minimum roadways and 2 6-ft. sidewalks.

The grading will involve the moving of approximately 750,000 cu. yd. of material, most of which is earth although some sand rock will be encountered. The grading is particularly heavy near the center of the line, one cut being over 75 ft. deep on the center line and another one over 100 ft. deep to the top of the upper slope. The roadbed will be excavated to a width of 48 ft. in cuts and will be built 34 ft. wide on embankment with slopes of $1\frac{3}{4}$ to 1 on fills, in accordance with the standard practice of the Great Northern lines east of the Rocky mountains.

LOCAL FREIGHT FACILITIES

The construction of the new station has also forced the Great Northern to relocate its local freight and team track facilities. To secure the desired room for the new station it will be necessary for this road to give up its freight house and the tracks adjacent to it.

To replace the facilities abandoned at this point the Great Northern has acquired property facing on Eighth street between Pine and John streets where a tract one block wide will be occupied with local freight houses and tracks. Team tracks will also be provided on this area while a similar tract will be given over entirely to this service. These tracks will be connected with the main line of the railroad near Mississippi street by a spur approximately one-half mile long.

The entire development will involve an expenditure of approximately \$300,000 excluding real estate and will give the Great Northern local freight facilities adjacent to and at the level of the wholesale district, eliminating the uphill haul now necessary with the inbound freight. It will also give the road larger facilities to handle the increased business offered to it and will open up a new district for industrial development.

The development of the local freight facilities has been carried on under the supervision of Ralph Budd, assistant to the president of the Great Northern, and A. H. Hoagland, chief engineer. Mr. Budd is president of the Twin City Belt Railway and M. A. Butler is chief engineer in direct charge of the construction of this line.

WASHINGTON CORRESPONDENCE

WASHINGTON, D. C., July 17, 1917.

REDUCTIONS IN PASSENGER SERVICE

Fairfax Harrison, chairman of the Railroads' War Board, has authorized a statement that the railroads of the United States, as part of their effort to make available a maximum of transportation energy for the movement of freight, report the elimination of passenger trains aggregating 16,267,-028 miles of train service per year.

"This is done by the railroads to save man power, fuel and motive power for transportation of necessities, Mr. Harrison said.

"Every ton of coal, every locomotive, every mile of track space, every man whose duties are absorbed by an unnecessary passenger train can be put to effective use in freight service, and nothing is more necessary at the moment to insure the safety and prosperity of the country. The railroads gave in April some 15 per cent more freight service with practically the same facilities as in April, last year. The elimination of passenger service already reported will make available for other purposes over 1,120,000 tons of coal. Many railroads, especially west of the Allegheny mountains, are still to be heard from."

The railroad systems in the Eastern department have cut out 8,598,696 miles of passenger train service, thus saving 716,113 tons of coal per year. The Pennsylvania System eliminated 3,300,000 miles of train service, saving 186,876 tons. The New York Central plans to save 126,000 tons. The Erie has cut out 1,600,000 passenger train miles; the Baltimore & Ohio, 1,168,596; the Chesapeake & Ohio, 850,000; roads in New England, 4,847,332 miles with a saving of 256,724 tons. The Boston & Maine cuts out 2,118,948 miles of service; the New Haven, 1,707,004 and the Maine Central, 442,676.

The Pere Marquette and the Wabash, the only roads reporting as yet from the Central department, have eliminated together 846,600 miles of service saving 49,555 tons of coal. The Southern Railway has cut out 1,900,000 miles and will save 97,282 tons of coal.

INCREASE IN EFFICIENCY DURING APRIL

The Railroads' War Board has received reports of freight operations in April from roads operating 184,814 miles of line, showing their freight efficiency as compared with April, 1916. These roads during April handled 46,317,112 freight train miles, an increase of 1,882,000 train miles or 4 per cent. Total freight car miles, loaded and empty, increased 21,328,000 or 14 per cent, while the empty freight car miles decreased 31,206,000. Freight locomotive miles were 54,766,000 as compared with 53,514,000 in 1916, while the ton miles totaled 30,869,000,000 as compared with 26,355,000,000 in 1916, an increase of 17 per cent. In other words, the freight performance of the roads in April was considerably greater than during the same month of 1916 and the increased performance was handled with greater efficiency. The average train load increased from 606 tons to 666 tons, an increase of 60 tons, or 10 per cent; the average carload increased from 23 tons to 26 tons, or nine per cent. The average daily mileage per locomotive increased from 64.6 to 66.9; average per freight car from 27 to 27.2. The ratio of empty to total freight car miles, also an element in increased efficiency of loading, fell from 30.6 to 28.3. Similarly, the proportion of freight locomotives and cars undergoing or awaiting repairs, was reduced, falling from 16.7 per cent in the case of locomotives to 15.3 and from 6.4 to 5.9 per cent in the case of cars. All three of the territorial districts, east, west and south, show gains in performance.

CENTRAL ACCOUNTING BUREAU

The Railroads' War Board recently issued a bulletin to the railroads announcing that the Sub-Committee on Military Transportation Accounting has been authorized and directed to take immediate steps to create and maintain, for the account of all the railroads, a central railway accounting bureau in Washington, through which railroad accounts for the transportation of men and materials shall be centered for submission to and settlement with the several departments of the government. The bureau will be maintained during the period of settlement of accounts occasioned by the existing war and will be under the immediate direction of the Sub-Committee on Military Transportation Accounting. The settlement of railroad transportation accounts against the War Department has heretofore been made through depot quartermasters at various points, but the War Department has under consideration the early concentration and centralization of railroad transportation accounts against it through its head office in Washington. When this change has been made transportation accounts against all government departments, except those of the reclamation service, will be settled through the Washington offices, and according to the circular of the War Board, unanimity in and quicker settlement of transportation accounts should result from the proposed change. It is believed that the railroads can substantially aid in the accomplishment of the ends sought by the War Department by the establishment of such a bureau, to be run in a co-operative way with the several governmental departments; and that its establishment will do much in producing quicker payments for service rendered by the railroads. This means the enlargement of the temporary bureau which was authorized by the War Board recently for the purpose of handling transportation accounts incident to cantonment construction.

EMBARGO ON EXPORT FREIGHT

Pursuant to the proclamation of the President on July 9 barring certain exports except under a federal license, and to prevent as far as possible the acceptance by railroads of such shipments, the Commission on Car Service at Washington on July 12 telegraphed a notice to all railroads in the country directing them to place a telegraphic embargo, effective immediately, against all shipments of coal, coke, feed grain,

flour and meal therefrom, fodder, meat and fats, fuel oils, kerosene, gasolene, pig iron, steel billets, ship plates structural shapes, scrap iron and steel, ferro manganese, fertilizers, arms, ammunition and explosives; consigned, reconsigned, to be reconsigned, or intended for export, except when a bill of lading is presented with federal license number furnished, or authorized by the Export Council at Washington and according to the announcement of the Department of Commerce, together with the permit number authorized by the port delivery road. Arrangements have been made under which all shipments consigned to points in Canada can go forward as heretofore, special licenses covering same having been issued through the customs service. It was suggested that port lines protect themselves against accumulations at ports by placing such embargo as necessary against cars in transit, and that all port lines should immediately inaugurate a permit system covering all export traffic.

CANDIDATES FOR THE INTERSTATE COMMERCE COMMISSION

About forty names of candidates for appointment to the Interstate Commerce Commission have been placed before President Wilson, who is expected to make an announcement shortly of the appointment of a successor to the late Judson C. Clements, and who will also have two additional places to fill when the bill increasing the membership of the commission from seven to nine becomes a law. The bill has been passed by both Houses of Congress and is now in conference. A large proportion of the names recommended are those of state commissioners and the names of several men who have long been associated with the work of the Interstate Commerce Commission are also understood to be under consideration. These include Attorney-Examiners E. J. Watkins, F. B. Dow and H. M. Thurtell, Secretary George B. McGinty, J. M. Jones, chief of the tariff bureau, and Frank McManamy, chief inspector of locomotive boilers. The names of a number of members of Congress have also been suggested, including W. C. Adamson, chairman of the House Committee on Interstate and Foreign Commerce. It has been stated that the President intends to wait until the bill has been finally passed, and make all three appointments at one time.

SOUTHWESTERN LINES INJURED BY RATE DECISION

In a statement recently issued, Charles E. Schaff, receiver of the Missouri, Kansas & Texas, has the following comments to make on the decision of the Interstate Commerce Commission in the advance rate case:

The decision of the Interstate Commerce Commission in the advanced rate case is particularly unfortunate for southwestern railroads. The figures which the commission cites as having largely controlled its determination that the western lines do not need an advance in rates include all lines west of the Mississippi river. Southwestern lines are victims of this grouping, although operating results indicate plainly that railroad conditions in the southwest are not fairly comparable to those in the northwest. The showings made by the Union Pacific, the Burlington, the Northern Pacific and the North Western, and other trans-continental systems, which do not serve the southwest at all, have apparently controlled the commission's conclusions as to the needs of all lines west of the Mississippi river.

In its decision, the Interstate Commerce Commission estimates that the average gross operating revenue per mile of road of Western lines for 1917 will be \$12,597, and that, based on April, 1917, operating costs, their average operating income per mile of road will be \$3,813. Anticipated increases in operating costs, it is conceded, will reduce this latter figure. Just how hard the decision hits southwestern lines is shown by comparison of the gross and net operating

revenues for 1916 of the 11 principal lines, including the Rock Island and the Gulf, Colorado & Santa Fe, which so largely serve the states of Texas, Arkansas, Oklahoma, much of Kansas and all of Missouri south of the Missouri river, with the commission's estimates for all western lines.

For 1916, the average gross operating revenue per mile of road for these 11 Southwestern lines was but \$9,757, and the average net operating revenue per mile was \$2,901. It should be borne in mind, too, that the Adamson law has imposed largely increased operating costs on all lines since the close of 1916, and that there also have been large increases in the cost of fuel, material and supplies. In short, should the 1916 basis of operating costs be effective, and the commission concedes that they will be increased, the gross and net operating revenues of southwestern lines will have to be increased more than 30 per cent each in 1917 in order to reach the averages estimated by the commission for western lines.

Our difficulty in the southwest is that these 11 lines, with approximately 35,000 miles of road, have been regulated as to rates on the basis of a showing made by trans-continental systems serving a western and northwestern territory in which conditions are dissimilar to those under which we operate. Railroads generally have not enjoyed their fair share of the country's prosperity during recent years. Southwestern lines have suffered particularly, as is indicated by the great proportion of southwestern lines now in bankruptcy or just emerging from receivership. This, too, in the face of the fact that the southwest has been conspicuously prosperous, and that nowhere in the nation does commercial and industrial growth demand greater expansion of transportation facilities.

Where the managements are to turn under present conditions, except to the Interstate Commerce Commission and other regulatory bodies, for money with which to expand facilities is a problem for which no solution appears. It is obvious that present revenues will not provide the means of expansion. In his opinion in the rate case, Commissioner Harlan estimates that for the last 16 years the average annual return for western roads on property investment has been 5.04 per cent. It has been shown how far under the averages for all western lines the southwestern lines have fallen, and it is, therefore, apparent that the return on property investment for southwestern lines is well under 5 per cent. Indeed, on the Missouri, Kansas & Texas for the ten-year period ending with 1916 the average has been 3.14 per cent annually.

The Interstate Commerce Commission's figures indicate that, if all its uncertain anticipations are realized in 1917, the railroads of the country will earn less than 6 per cent on property investment. Southwestern roads will certainly earn much less than 6 per cent. I recently saw a statement showing that 104 American industrial companies enjoyed a total net income during 1916 of a billion and a quarter dollars, as against a quarter of a billion dollars in 1914. Eight industrial companies, which dispose of their output almost entirely to transportation systems, with three steel companies which depend largely on the railroad market, in 1916 enjoyed a net income, after all expenses, materially larger than the operating revenues, before taxes and other fixed charges, of the eleven southwestern railroads previously referred to.

It is against such investment opportunity that the railroads must compete when they seek money with which to expand facilities. Naturally, new money is not to be had for railroad purposes under these conditions, however plentiful it may be for other investments. Nor can it be had, particularly for southwestern lines, so long as less than 6 per cent is held to be an adequate return on property investment in prosperous years, without assurance that any return will be possible during periods of depression.

ONLY GOVERNMENTS ARE BUYING CARS AND LOCOMOTIVES AT PRESENT PRICES

Figures given by the Interstate Commerce Commission in the appendix to its decision in the Fifteen Per Cent case show increases of from 50 to 150 per cent in the prices of cars and locomotives in 12 months' time. Furthermore prices have increased about 30 per cent since the first of the year and are still on the upward trend.

A year or two ago a freight car cost about \$1,000 to \$1,500. The Pennsylvania in February paid \$3,742 for a 70-ton hopper car and \$3,555 for an all-steel box car. The Pennsylvania, according to President Rea, wanted to buy 5,000 coal cars. At \$3,742 each the road's reasons for omitting to provide itself with this equipment are apparent.

The railroads of this country up to about the first of

TABLE I—THE ORDERS TO JULY 15 THIS YEAR AND LAST

Locomotives	1916	1917
Domestic	1,750	2,120
Foreign	872	1,608
Total	2,622	3,728
Freight Cars		
Domestic	54,882	50,255
Foreign	20,675	24,650
Total	75,557	74,905

June were buying locomotives on a large scale, 1933 engines in the first five months of 1917 as compared with 1563 in the same period of 1916. They had to pay as high as \$60,000 for Mikado or Santa Fe locomotives, \$35,000 for eight-wheel switching locomotives and \$25,000 for six-wheel switching locomotives. The Norfolk & Western had a chance in May to buy some big Mallet locomotives; but the price asked was too much. The road is now building the locomotives in its own shops. Two other roads are reported to have paid over \$100,000 for Mallet locomotives.

Since the first of June, the domestic orders for locomotives have fallen off considerably. In the six issues of the *Railway Age Gazette* since the last of May, there have been reported only 187 locomotives, 100 of which were ordered by one road, the Atchison. Most of the big locomotive

* TABLE II—ORDERS SINCE JUNE 1

Railroads	Locomotives	Freight Cars
Builders	171	8,435
Company shops	16	5,390
Total	187	13,735
Governments		
For domestic use	...	6,100
For use overseas	1,014	10,100
Total	1,014	16,200

orders now are for engines to be used across the sea, the allies overseas apparently having finally won out in the competition for space in the locomotive plants. Since the first of June, Russia alone has ordered 500 one-hundred ton Decapod locomotives and 68 narrow gage locomotives in this country and it is understood that it has not placed all the orders it has wanted to place. Its negotiations covered the purchases of 2,000 large and from 142 to 400 small locomotives, and it is thought that as soon as the financing is arranged the additional orders may be placed. The British government has ordered 100 more large Consolidation locomotives from the Baldwin Locomotive Works. With the small orders and with the United States government orders last week for 150 80-ton Consolidation locomotives each with the American Locomotive Company and the Baldwin

Locomotive Works, for service in France, this means that the total orders for locomotives for service overseas is 1014 as compared with only 187 for domestic use.

The total orders for cars for domestic use since the first of June have totaled 19,835 and the foreign orders 10,100. The latter included the 10,000 1200-pood (43,200 lb.) capacity, four-wheel cars ordered by the Russian government. The domestic orders included 6,000 cars ordered by the Canadian government for the Canadian government

ery has confined its orders to the Altoona shops and no cars for 1918 delivery have been ordered elsewhere.

The French government is looking for a chance to place an order for possibly 20,000 cars and there is still pending the question as to whether the United States government should buy 100,000 or more cars.

BRITISH RAILWAYMEN'S CONGRESS.—At the recent annual meeting of the National Union of Railwaymen in Eng-

TABLE III—CAR AND LOCOMOTIVE PRICES THIS YEAR AND LAST

CARS—		1916		1917		
Road	Type	Price	Date of Order	Price	Date of Order	
Chesapeake & Ohio	Hopper	\$949		\$1,531	October, 1916	
Chicago, Burlington & Quincy	Box	898	Feb or July, 1915	1,549	November, 1916	
	Gondola	1,637	March, 1915	1,891	November, 1916	
Illinois Central		1,682		2,600		
Northern Pacific	Refrigerator	1,559	(1913)	2,475	January, 1917	
	Gondola	1,042	(1913)	2,175	January, 1917	
Last lots purchased in 1913						
Pennsylvania Lines East	Steel coal	1,466	January, 1916	3,742	February, 1917	
	Steel box	1,500	January, 1916	3,555	February, 1917	
Peerless Transit Line		\$900 to \$1,100		\$3,750 to over \$4,000		
\$900 to \$1,100 shown simply as "former price." The "over \$4,000" is price for immediate delivery.						
Southern Pacific	Tank	1,463	March, 1916	2,807	February, 1917	
	Gondola	1,295	February, 1916	1,919	February, 1917	
	Combination baggage and mail	9,786	February, 1916	12,319	March, 1917	
Western Maryland	Coal	1,035	October, 1915	1,529	October, 1916	
Atlanta, Birmingham & Atlantic		(This company has had bid submitted in 1915 of \$42,510 for two combined steel baggage, mail and express cars. This compares with the price paid the same company in 1916 for two units of same equipment of \$23,640.)				
LOCOMOTIVES—		1916		1917		
Road	Type	Weight	Price	Date of Order	Price	Date of Order
Chesapeake & Ohio	2-6-6-2	435,000	\$31,019	October, 1915	\$48,139	June, 1916
Chicago, Burlington & Quincy	Santa Fe	367,850	26,518	March, 1915	46,450	November, 1916
	Mikado		22,017	March, 1915	42,505	November, 1916
Chicago, Indiana & Louisville	Santa Fe	350,000	31,300	March, 1916	59,000	
Delaware & Hudson			Price of a locomotive 25 per cent larger than former ones is 200 per cent higher.			
Illinois Central	Mikado	278,000	22,205	February, 1915	41,661	February, 1917
	6-wheel switching	170,000	12,400	January, 1915	26,756	February, 1917
	Pacific	278,000	27,818	February, 1916	42,935	February, 1917
New York, Chicago & St. Louis	Switching	173,500	19,250	March, 1916	23,375	November, 1916
1917 locomotives bought under option given in open market would have cost \$31,750.						
Norfolk & Western			43,360		77,500	
Quotation not accepted and none bought.						
Northern Pacific	Mallet	456,000	42,035	(1913)	61,200	January, 1917
	Mikado	330,000	27,977	(1913)	42,700	January, 1917
	Mikado	330,000			61,950	April, 1917
Pennsylvania Lines East	Mikado		39,000	Jan. or May, 1916	63,000	February, 1917
Pere Marquette	Santa Fe	320,000	Not shown		56,250	April, 1917
	8-wheel switching	204,000	Not shown		38,900	April, 1917
Southern Railway	Santa Fe	370,000	\$38,400	April, 1916	73,850	May, 1917
	8-wheel switching		25,483		35,850	May, 1917
Toledo, St. Louis & Western	Consolidation	193,000	19,453	December, 1915	24,316	
Union Pacific	6-wheel switching	156,000	14,913	January, 1916	26,780	March, 1917
Western Maryland	2-8-8-2	495,000	37,276	June, 1915	66,531	October, 1916

Note.—The figures in the foregoing table were compiled as follows: The name of the road, the prices given and the type of locomotive or car are given in appendices 3 and 5 of the Interstate Commerce Commission's report in the Fifteen Per Cent Case. The dates of the orders, the weights of the locomotives, etc., have been supplied from the records of the *Railway Age Gazette*.

Railways and 100 for the Temiskaming & Northern Ontario Railway.

In short, the orders from railways the last month and one-half have totaled only 13,735; those of governments, 16,200. Of the 13,735 ordered for use by the railways directly, only 8,435 were ordered from equipment builders; the remainder, 5,300, are to be built in railroad shops. The Pennsylvania, to take one example, has not ordered a single car from equipment builders so far this year. Owing to the extremely high prices of materials, the difficulty of obtaining deliveries, and the scarcity of labor, that road in arranging for the construction of freight cars for 1918 deliv-

land, A. Bellamy, in his presidential address, said that the membership had risen in four years from 132,000 to 340,131. On the second day of the convention, the members passed the following resolution: "That this congress enters its emphatic protest against the release of more railwaymen for military service on the grounds (1) that an undue strain is already being placed on the men, and (2) that substituted labor has already been proved to be inefficient and a serious menace both to the railwaymen and the traveling public; and that should the release of men be continued this congress empowers the Executive Committee to use every means to secure safe working of the railways."

DANIEL WILLARD ON THE RAILROAD SITUATION

Daniel Willard, president of the Baltimore & Ohio and chairman of the Advisory Commission of the Council of National Defense, also chairman of its committee on transportation, has given out at Washington through the Committee on Public Information a statement to the public outlining some of the aspects of the railroad situation with reference to their nationalization under the direction of the Railroads' War Board.

"The essence of the railroad situation," said Mr. Willard, "is that the railroads of the whole United States are nationalized. The 693 railroad companies operating in 48 states and controlling 263,000 miles of road are responding admirably to central direction from the so-called Railroad War Board of railway presidents. They have responded to every suggestion made by the Council of National Defense through the War Board. They have made all transfers of troops on schedule in a manner, so far as I am advised, entirely satisfactory to the War Department, without serious disruption of regular traffic. They have tremendously increased the supply of coal cars, facilitated the transit of grain and met the needs of the government at least as promptly and effectually as if they were under direct government authority."

President Willard explained that last summer the railroads worked out with Colonel Baker, of the Quartermaster's Corps of the Army, a complete scheme for wartime railroad operations and that this scheme, since elaborated and perfected, has worked so well that "during the past two months the railroads of the country, though handling vastly more ton miles than ever before, have been constantly transporting troops in considerable numbers without in the least interrupting regular traffic."

The regular traffic, he explained, has been larger probably than in any previous period in the history of the country. "Traffic was heavy before the United States entered the war," he said, "because of the necessity of moving tremendous quantities of supplies, material and finished products for the Allies, but since April 6 it has increased tremendously. The reports for the month of April show that the railroads of the United States in that month handled over three billion more ton miles than were handled during the same month in 1916—an increase in business amounting to 16 per cent. And the traffic in April, 1916, although there was a strike impending, was heavy compared to almost any year before the beginning of the European war."

Mr. Willard said that, in the judgment of many railroad men who have followed the situation closely, vital congestion would have hindered the transportation of troops, seriously delayed the completion of the cantonnements and aggravated the coal situation if the railroads had not voluntarily made themselves ready to act as a unit in response to the suggestions of the War Board.

"Beginning with April 6," he said, "business activity has been greater than ever before in America, I think. It was stimulated in many directions—by the manufacture of uniforms, clothing, materials for the building of cantonnements, making of ammunition, etc. Then traffic was increased by the withdrawal of many of the lake boats and the roads had to assume that extra burden. Boats were also withdrawn from coast traffic, both on the Atlantic and Pacific, and much of the bulk that has been going through the Panama Canal was turned over to the railroads. And there were other factors. For instance, the farmers of the country responded in fine spirit to the request of the Secretary of Agriculture that they plant more land. They planted 30 per cent more land than a year ago and called upon the railroads to move large quantities of agricultural implements, fertilizer, seed, etc."

Before America's entrance into the war, Mr. Willard said, there was serious railroad congestion, not because the railroads were broken down but because traffic had been extraordinarily heavy and there was no concerted move possible to get greater efficiency. One of the first steps of the War Board was to request the railroads to give preference to the movement of coal, particularly coal for the government, and that the second preference should be given to ore. Means for identifying government shipments were devised and orders were sent out by the railroads to send government freight through to destination whether or not there were through rates and divisions prevailing. Ways were also planned to accelerate allied shipments, after conferences with representatives of the allied nations, and the roads were encouraged and urged to expedite the repair of cars and of locomotives and to load cars to their utmost capacity.

THE ROADMASTERS' CONVENTION

At a meeting of the Executive Committee of the Roadmasters' & Maintenance of Way Association, held in Chicago on July 14, it was decided to hold the annual convention at Chicago on September 18 as planned but to shorten it to three days.

The advisability of postponing the meeting this year was considered carefully and it was decided that the unusual and serious problems confronting track men in the securing of labor and materials made the exchange of information more than usually advisable at this time. The program of committee work was revised radically to enable most of the time to be devoted to the consideration of those problems of particular importance at the present time. The program as outlined is as follows:

TUESDAY, SEPTEMBER 18.

- 9:30 A. M.—Convention called to order.
Reports of president, secretary and treasurer.
Appointment of committees on nominations, resolutions, auditing, etc.
- 10:30 A. M.—Committee report: Recommended methods for the inspection of ties in track and recommendations for renewals.
- 2:00 P. M.—Committee report: The best methods of securing and retaining track labor.
- 4:30 P. M.—Paper: Maintenance of track in large terminals. C. J. Coon, engineer of track, Grand Central Terminal, New York.
- 7:30 P. M.—Paper: Economical methods of maintaining street and highway crossings. M. J. Griffin, supervisor, C. R. R. of N. J., Jersey City, N. J.
- 8:30 P. M.—Building the tracks at the cantonnements. Coleman King, supervisor, Long Island, Jamaica, N. Y., and others.

WEDNESDAY, SEPTEMBER 19.

- 9:30 A. M.—Paper: The present maintenance of way material problem. W. A. Summerhays, assistant purchasing agent, Illinois Central.
- 11:30 A. M.—Paper: The oiling of rails and fastenings to protect them from corrosion. E. T. Howson, engineering editor, *Railway Age Gazette*.
- 2:00 P. M.—Paper: Housing and feeding maintenance of way laborers.
- 3:00 P. M.—Paper: Labor saving devices for track work.
- 4:00 P. M.—Inspection of exhibits, Track Supply Association.
- 7:00 P. M.—Annual banquet given by the Track Supply Association, Thursday, September 20.
- 9:30 A. M.—Discussion of current track problems.
- 10:30 A. M.—The inspection of rails during their manufacture, by Chas. W. Gennett, Jr., manager, rail inspection department, R. W. Hunt & Co.
- 11:00 A. M.—Election of officers.
Selection of meeting place for next convention.
Closing business.
- 1:00 P. M.—Leave for inspection of rail mill of the Illinois Steel Company, Gary, Indiana.

The Track Supply Association will present an exhibit in connection with this convention.

SPANISH RAILWAY CAPITAL.—Of the capital invested in railroads in Spain \$37,000,000 is foreign. France having about \$20,000,000, Belgium \$15,000,000, and England \$2,000,000.

Fuel Department of the Rock Island

The Purchase, Distribution, Handling and Consumption of All Fuel Is Controlled by a Separate Department

THE fuel department of the Chicago, Rock Island & Pacific is unique in that the purchase of the fuel, its distribution, method of handling, and its consumption are in the hands of the mining and fuel department, the manager of which reports direct to the chief operating officer of the road. This brings under one head all questions pertaining to fuel and presents an opportunity for the obtaining of a true fuel economy, cost and consumption considered.

ORGANIZATION

The officers of this department rank as general officers and deal directly with the superintendents of the various divisions. Each superintendent is held responsible to this

Instructions regarding the use of fuel in locomotive service and at stationary plants emanate from the office of the mining and fuel department. They are sent to the division superintendents for distribution to the assistant engineers of fuel economy, the road foremen of equipment, stationary plant engineers, or whoever is affected by them. All questions which arise on the road concerning fuel are submitted through the various division superintendents to the Mining and Fuel Department.

The duties of the superintendent of fuel are the negotiation of contracts and the purchase of fuel, including coal for locomotives and stationary plants, coke, and oil, and such other special fuels as may be required. His staff looks after the inspection of the fuel, the checkweighing of cars, including surprise checkweighing tests to eliminate carelessness, deliberate or otherwise, on the part of the mine weighmaster.

The fuel inspectors advise the main office regularly as to labor matters and any unusual conditions existing at the mines which may in any way interfere with the prompt delivery of coal. Fuel inspectors also send in samples of coal from the various mines for laboratory test, so that from the information available the most suitable coals can always be selected for the respective requirements.

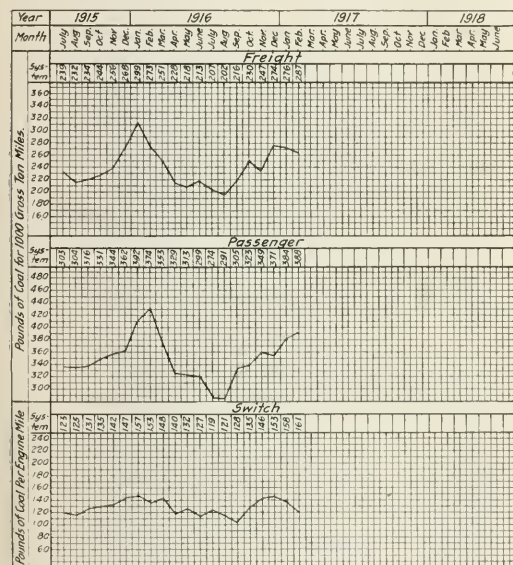
The duties of the coal chute supervisor are to look after the cost of handling fuel and the operations of the 157 chutes on the system. With his two inspectors he sees that the fuel is handled at the lowest possible cost, and where necessary he recommends changes which will reduce the cost, co-operating with the superintendents on their respective divisions.

The duties of the superintendent of fuel economy and his six assistants are to look after the economical use of fuel on locomotives, which consists in the instruction of the engine crews in the best method of firing and the supervision of the condition of locomotives as far as they affect the consumption of fuel. This includes the inspection of engines at terminals to the extent that the boilers are properly cleaned inside and outside; that the required size of nozzle is maintained; that all packings are in a condition for best operation.

The fuel economy staff also holds general meetings at the larger centers, where by moving pictures and lantern slides the essential features of fuel economy are vividly brought to the attention of the men using the coal. These instructions include the prevention of obnoxious smoke and other features which are essential to the best results.

The duties of the supervisor of stationary plants are to look after the fuel consumption of the stationary plants and to generally supervise the steam generating plants used for the operation of shops, pumps and for heating. He sees that the boilers are fired in the proper manner and that boilers, steam and air pipes are maintained to prevent leaks which cause an increase in fuel consumption.

The entire staff co-operates in any method which may bring about the most economical results, and while certain assignments of duties are made, there is a general interchange of work on matters which bring about final results; in traveling over the system every employee is required constantly keep fuel economy before him. The coal inspectors traveling from one mine to the other are required to travel on locomotives in order to note that tanks are not overloaded at fuel stations, which is the particular duty of the coal chute inspectors; in like manner the coal chute



supervisors at terminals check the movement of coal cars, loaded and empty.

DISTRIBUTION

The Rock Island uses coal from approximately 70 coal mines. The most economical grade of coal is determined for each point on the system and daily schedules of delivery are drawn up each week in the general office, and the amount of coal to be delivered during the coming week is determined from the previous week's consumption. A coal report is made up in the office of each superintendent daily, the day ending at 6 p. m.; this is wired to the general office before 3 a. m. the next morning. The information conveyed in this report is as follows: Amount of coal in pockets at the coaling stations and on the chutes in cars; number of cars not placed at the chutes; amount of coal used at each station during the preceding 24 hours; number of cars in transit for this and other divisions and to what stations consigned; number of loaded cars with company coal waiting for train, including the stations at which the cars are held and to what station they are consigned; amount of coal received from each individual mine and from junction points; amount of company coal in cars billed from the mines and junction points and to what stations it is consigned; number of cars of company coal loaded at the local mines; number of empty cars delivered to the local mines for company coal; number of cars of company coal received from local junction points with other roads and the number of empty cars delivered to those points; amount of storage coal loaded or unloaded; together with the amount on the ground at the various stations; amount of fuel oil on hand in storage tanks and in cars, and the number in transit at each station. Also the number of gallons of fuel oil consumed during the preceding 24 hours.

This report gives the general office complete information regarding the amount of coal on hand at each station, shows the location of the cars in transit to other divisions and shows whether or not the mines are keeping up with their daily schedule of output.

Under normal conditions, about 1000 cars are required to keep the stations supplied, and this represents about $\frac{4}{5}$ days' consumption for the system. In addition to this, about one day's supply is kept in the various chutes and fuel station bins. Particular attention is given to the proper utilization of cars, and box cars are frequently used even though the cost of handling is greater, to effect greater car efficiency. Self-cleaning cars are assigned to chutes equipped for mechanical handling and flat bottom cars where unloaded by hand.

Special efforts are made to prevent the mixing of coal and to furnish regularly the same grades of coal for use on a given territory.

LOCOMOTIVE PERFORMANCE

To this time no attempt has been made to check the individual performance of each engine crew, but collective statements showing the performance on each division, divided into freight, passenger and switch service are posted in the round houses which show the performance of each division compared with the same month of the previous year and the loss or gain reduced to dollars and cents and the respective position which each division occupies toward the entire system. These statements are furnished in the shape of graphic charts and in tabulated figures as well. The engine crews are fully informed that these tables do not reflect conditions entirely within the control of the management. There are certain factors, such as the quality of coal available, type and size of engine used, grade conditions, and density, direction and distribution of traffic, which all have an important bearing on coal consumption, but inasmuch as some of these conditions are more or less permanent, any change of conditions is readily observed by the up or

down grade lines on the graphic charts, and considerable competition has been developed in this direction.

It is contemplated in the very near future to adopt an individual performance record, which will be prepared in the office of each division superintendent immediately at the end of each run. The information as to the consumption of coal will be obtained from a slip made out by the engineers showing the amount of coal used on each trip. This fuel consumption slip is a part of the time check and will be handed in at the superintendent's office with the time slip so that the information will be promptly available and enable the immediate compilation of the performance of each engine. This method will obviate the necessity for coal tickets which are now used but from which no satisfactory reports can be compiled.

RESULTS

This organization has been in operation for about a year, and while this period is entirely too short to determine the full possibilities, it may nevertheless be of interest to point to the following comparisons:

For the year ended June 30, 1915, the amount expended for coal for all uses amounted to \$7,168,378.41, and for the year ended June 30, 1916, the corresponding amount was \$6,762,430.88, or a difference of \$405,947.53. This saving was made with an increase in 1000 ton-miles in freight service of 913,866. This indicates a saving of \$826,802.56. In other words, had as much work been done in 1915 as was done in 1916, the fuel bill for 1915 would have been 12.2 per cent greater than it was during the year 1916. It is safe to anticipate that the increased cost of coal due to higher wages calls for intensified work in the direction of fuel economy and that the use of improved mechanical appliances and better firing methods will result in a decided reduction in the quantities consumed, a situation most necessary in view of the rapidly climbing cost of coal at the mines.

CO-OPERATION IN LAND VALUATION

Up to the present time the Division of Valuation of the Interstate Commerce Commission has made its valuations of land entirely independent of the carriers. There have been many objections to this practice and a plan of co-operation has recently been authorized by the Director of Valuation for the determination of the normal or naked land values. The following memorandum has been issued by the Division of Valuation under date of June 25, 1917.

Steps to be taken in order:

1. Blue prints in duplicate are to be furnished by the carriers, one set to become the official maps of the Commission's appraiser, and the other to be marked as hereinafter described and returned to the carrier.

2. The appraisal work will be done by the forces of the Commission and those of the carrier without co-operation, except in the case of fixing zone limits, which, if possible, should be agreed upon. (It is understood that such zone limits are only tentative, and after further information—sales, opinion, etc.—are gathered, may be changed either by the railroad or the Commission.)

All information such as opinions are to be separately gathered and considered, and unit prices are to be set by both the carrier and the Commission without joint discussion. It may be profitable, both in the saving of time and money, that record information such as sales and assessments, ground rents, etc., be exchanged; but this will simply be the *record information* and should not indicate the relative importance set by the appraiser on each such piece. Additional information, such as true considerations, etc., where this is not a matter of record, should not be furnished by the Commission to the carrier; but where the carrier desires

to do so, in a spirit of helpfulness, it will be received by the Commission's representative.

3. Returns to Order No. 7 should be in the hands of the Division of Valuation.

4. When the field appraisal work has been completed by the Commission, the areas will be calculated and marked upon the duplicate maps, together with the zone limits, classification as between carrier and non-carrier, and excluded areas, and returned to the carrier in order that it may have full knowledge of the quantities, etc., upon which the Commission bases its findings.

5. Areas by zones should be checked by the carrier. It will be understood that the Commission's figures have not previously been checked, and may contain errors. The carrier may not agree to some features, such as the exclusion of certain areas, but for the purpose of agreeing as to unit prices it should make its calculations on the same basis—i. e., the same zones and exclusions—as used by the Commission. Differences as to area, and objections to classification, should be furnished by the carrier to the Commission within 30 days after receipt of duplicate maps for a valuation section. The Commission will recompute all disputed areas and advise the carrier so that all disputed questions in this connection may be settled. It will also consider the carrier's objections to classification and advise of any changes in this respect. It will be understood that the district office has no authority to modify classification where the point is distinctly covered by instructions, nor can such cases be modified by the joint conference hereinafter referred to. However, points which depend upon an interpretation of the instructions, or an understanding of the facts, and may under the instructions be modified, may be brought up and discussed at the joint conference. In every case, however, the carrier should, prior to the conference, furnish a written statement to the district office covering each instance of such classification. In passing these points the carrier waives none of its rights to later present them to the director.

6. When the field work has been completed, the carrier will furnish a statement to the supervisor of land appraisals, showing the total area and total value, by valuation sections. By value is meant normal land value only, in terms of adjoining or adjacent similar land.

7. The Division of Valuation will thereupon at once furnish the carrier a statement of its totals, area and value, by valuation sections.

8. Some of these valuation sections will doubtless be accepted by the railroad and no further work need be done on them. Where they do wish to dissent, however, they should then prepare and submit a tabulation, such as shown on the attached form, giving the Commission's zone number; the carrier's corresponding zone or zones; the area agreed upon or the basis of the Commission's methods (it being understood the carrier does not waive any of its rights in this connection to later present its claims to the director for areas in industrial tracks, public streets, etc.); unit price, or prices, with the carrier's average price for the commission's zone, and the total value for each zone.

The other columns on the form will then be filled out with the Commission's figures, so that the comparative values will be clearly shown, and a copy sent to the carrier.

9. After this statement has been prepared a joint conference shall be had between representatives of the carrier, the district office, and the supervisor's office, with a view to harmonizing, where possible, these differences. At this conference all information gathered by the appraisers of both sides should be available and will be offered freely. The carrier will be required to have its supporting information so indexed as to be available for ready reference. The conference will in the first place be held at some convenient point and such differences as can be eliminated disposed

of without the necessity of visiting the property. In some cases, however, it may be necessary to make a personal inspection of the property. In the case of the larger roads, it may be desirable to take the matter up by several convenient divisions rather than to have one conference only for the entire system. It will be understood that the findings of this joint conference will not be binding upon either party until ratified by both the director and the carrier. In addition to the discussion of unit prices at this conference as many differences as possible in classification as between carrier and non-carrier should be eliminated.

INTERSTATE COMMERCE COMMISSION DIVISION OF CAR SERVICE

The announcement of the establishment of the Division of Car Service of the Interstate Commerce Commission was briefly reported in last week's issue. The notice issued by the commission on July 12 describing the organization and purposes of the commission gives some further details as follows:

"The Interstate Commerce Commission has created a Division of Car Service under the authority conferred by the car service act approved May 29, 1917, amending Section 1 of the act to regulate commerce, to deal with the movement, distribution, exchange, interchange, and return of freight cars. E. H. DeGroot, Jr., until recently superintendent of transportation of the Chicago & Eastern Illinois, now in the exclusive employ of the Interstate Commerce Commission, has been appointed chief of the Division and with A. G. Gutheim, attorney-examiner of the Interstate Commerce Commission, will take immediate charge of its organization and operation. The commission has also secured temporarily for this work the services of H. C. Barlow, chairman of the executive committee of the National Industrial Traffic League. During its formative period the division will have the collaboration and advice of Mr. Barlow.

"The Interstate Commerce Commission through this division will regulate car service throughout the United States, and, where occasion requires, orders or directions of the Interstate Commerce Commission will issue under the Car Service Act direct to the carrier or carriers concerned. Subject to this fundamental principle, the Division of Car Service will, as far as practicable, avail itself of co-operative effort on the part of the carriers' Commission on Car Service now located in Washington. This latter body consists of seven members, all superintendents of transportation of different railroads which territorially cover practically the entire United States. The Commission on Car Service has a large force of assistants under its control in Washington and in the field.

"Complaints and communications regarding car service received by the Interstate Commerce Commission will be handled through the new division. The field service will be developed as occasion may require. It is expected that shippers and receivers of freight will to the fullest extent aid in promoting car service by promptly loading and unloading carload shipments, by capacity loading, where possible, regardless of carload minima, by readily adapting themselves to such modifications in the handling of less-than-carload shipments as may be found necessary, and by hearty co-operation in the other methods which have been or may be devised to meet the transportation problems confronting the country.

"The commission is advised that the carriers have appointed local car service committees at some 25 points throughout the country, and that the National Industrial Traffic League has appointed similar committees of shippers at the same points, the aim being to secure harmony and co-operation between shippers and carriers. The

commission suggests that these committees should meet jointly, where necessary, to adjust local affairs; any irreconcilable differences which arise may be referred to the carriers' commission on Car Service or to the Division of Car Service of the Interstate Commerce Commission for adjustment."

A brief account of the life of Edward H. DeGroot, Jr., the chief of the new division, was published in these columns last week.

Mr. Gutheim was born in 1878 at Cambridge, Mass., and entered railway service with the Fitchburg Railroad, now part of the Boston & Maine, in 1896. He was connected with the accounting department of that railroad and of the Boston & Maine until 1906, when he resigned to become a special agent of the Bureau of Corporations of the Department of Commerce and Labor. At the time of his resignation he was chief clerk in the general accounting office and had just been promoted to traveling auditor. He had studied law and had been admitted to the Massachusetts bar and for a time practiced law in Massachusetts. On October 1, 1908, he became connected with the Interstate Commerce Commission as an examiner of accounts and since that time has been special agent, assistant chief of the division of inquiry, attorney for the commission on several in-

the purpose to make a thorough study of the situation in order to ascertain what steps it may be advisable for the commission to take in addition to the work which has been carried on by the Commission on Car Service for several months. Attorney-Examiner Gutheim has been attending the meetings of the Commission on Car Service for the past three months and, therefore, is thoroughly familiar with the work that has been done; and as the representative of the Interstate Commerce Commission he has handled complaints and communications from shippers in regard to matters pertaining to car service. He has co-operated actively with the railroads' committee in its efforts to secure greater efficiency from the existing transportation facilities by promoting heavier loading of cars and prompt loading and unloading, etc. Moreover, the Interstate Commerce Commission has co-operated with the Commission on Car Service and its predecessor, the Committee on Car Efficiency, since the latter went to Washington in November, first through Commissioner McChord and Attorney-Examiner F. B. Dow, who attended the meetings of the railroad committee, and later through Commissioner Hall and Mr. Gutheim. Commissioner Clark also attends meetings of the Railroads' War Board as an ex-officio member and participated in the discussions which led to the adoption of new car service rules on April 26, under which



A. G. Gutheim



E. H. De Groot, Jr.



H. C. Barlow

vestigations, attorney-examiner, and in connection with work for the commission, has been special United States attorney in different districts on numerous cases.

Henry C. Barlow is traffic manager of the Chicago Association of Commerce and has been connected with that association and its predecessor, the Chicago Shippers' Association, since 1904. He was born on August 15, 1850, at Niles, Mich., and entered railway service in 1866 as office boy and clerk for the Illinois Central. He was later telegraph operator for the Chicago & North Western, and later clerk, agent and traveling freight agent for the same road. In 1881 he became division freight agent for the Winona & St. Peter and Dakota Central Railroads and from July, 1882, to November, 1884, was assistant freight agent of the Atchison, Topeka & Santa Fe. In 1883-1884 he was general freight agent of the same road and from 1884 to 1886 was traffic manager of the Mexican Central. From 1887 to 1893 he was traffic manager of the Wisconsin Central Lines, leaving that system in 1893 to become vice-president and general manager of the Evansville & Terre Haute. From 1894 to 1901 he was president of the same road. He was afterward traffic manager for the General Paper Company and in September, 1904, became general manager of the Chicago Shippers' Association, later becoming traffic director of its successor, the Chicago Association of Commerce.

For the present it is understood that the new division does not contemplate any great activity on its own account as it is

the freight car equipment of the country has been practically pooled.

The text of the Esch-Pomerene law, is defined as an amendment to the act to regulate commerce, is as follows:

The term "car service," as used in this act, shall include the movement, distribution, exchange, interchange, and return of cars used in the transportation of property by any carrier subject to the provisions of this act.

It shall be the duty of every such carrier to establish, observe and enforce just and reasonable rules, regulations, and practices with respect to car service, and every unjust and unreasonable rule, regulation, and practice with respect to car service is prohibited and declared to be unlawful.

The Interstate Commerce Commission is hereby authorized by general or special orders to require all carriers subject to the provisions of the act, or any of them, to file with it from time to time their rules and regulations with respect to car service, and the commission may, in its discretion, direct that the said rules and regulations shall be incorporated in their schedules showing rates, fares, and charges for transportation and be subject to any or all of the provisions of the act relating thereto.

The commission shall, after hearing, on a complaint or upon its own initiative without complaint, establish reasonable rules, regulations, and practices with respect to car service, including the classification of cars, compensation to be paid for the use of any car not owned by any such common carrier and the penalties or other sanctions for nonobservance of such rules.

Whenever the commission shall be of opinion that necessity exists for immediate action with respect to the supply or use of cars for transportation of property, the commission shall have, and it is hereby given, authority, either upon complaint or upon its own initiative without complaint, at once, if it so orders, without answer or other formal pleading by the interested carrier or carriers, and with or without notice, hearing, or the making or filing of a report, according as the commission may determine, to suspend the operation of any or all rules, regulations, or practices then established with respect to car service for such time as may be determined by the commission, and also authority to make such just and reasonable directions with respect to car service during such time

as in its opinion will best promote car service in the interest of the public and the commerce of the people.

The directions of the commission as to car service may be made through and by such agents or agencies as the commission shall designate and appoint for that purpose.

In case of failure or refusal on the part of any carrier, receiver, or trustee to comply with any direction or order with respect to car service, such carrier, receiver, or trustee shall be liable to a penalty of not less than \$100 nor more than \$500 for each such offense and \$50 for each and every day of the continuance of such offense, which shall accrue to the United States and may be recovered in a civil action brought by the United States.

ILLINOIS CENTRAL 2-10-2 TYPE LOCOMOTIVES

The Illinois Central has received from the American Locomotive Company three locomotives of the 2-10-2 type which are being used in hump yard service, and which have been giving good results. As it was thought that freight locomotives of this type might be adopted later, the details were worked out to make these engines suitable for road service as well as yard service. As many parts as possible were made interchangeable with the Mikado type locomotives which are now in use in main line freight service. The tenders used for these two classes are identical, as are also the foot plates, driving boxes (except for the main driver), driving springs, crossheads, fire door, valves, certain valve motion parts and the cab.

The boiler is of the wagon top type designed to carry 185 lb. pressure with a factor of safety of 4.5. It has an outside diameter of 96 in. at the dome course and 82½ in. at the front course. The firebox has an unusually large volume; the grate area is 80.4 sq. ft. and the firebox is 82 in. deep at the back and 97½ in. deep at front. It has a combustion chamber 48 in. deep and is equipped with a

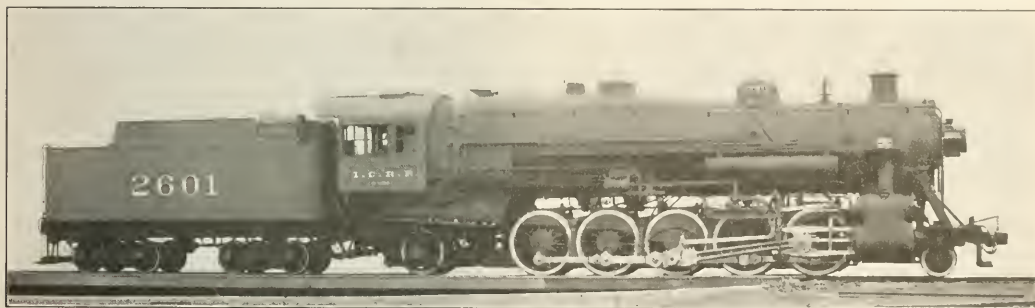
The main crank pins are hollow. The crank and crosshead pins are of acid open-hearth steel, while the crosshead keys are chrome-vanadium steel and the piston rods nickel-chrome steel. The pistons and piston rings are of Hunt-Spiller iron and the cylinders have bushings ¾ in. thick of the same material. The piston valves are 15 in. in diameter and have extended valve stems. The valve motion is of the Walschaert type, being controlled by a power reverse gear. All the pins are case hardened and work in brass bushings.

To make the valves on the turret more accessible it is placed on the backhead of the boiler. A special arrangement has also been used to prevent trouble due to pipes being shaken loose by the vibration of the cab. The holes in the cab are made 1 in. larger than the pipes which pass through them and all steam pipes have leather collars which are clamped to the cab by means of metal rings, thus forming a tight joint between the pipe and the cab.

The brake equipment used on these locomotives is the New York Air Brake Company's Type L T, with two No. 5 air compressors. Two 14-in. brake cylinders are provided for the first six drivers and two 12-in. cylinders for the last four drivers. One 14-in. by 12-in. brake cylinder is used on the tender.

The principal dimensions and ratios of these locomotives are as follows:

General Data	
Gage	4 ft. 8½ in.
Service	Yard
Fuel	Bit. coal
Tractive effort	67,173 lb.
Weight in working order	367,000 lb.
Weight on drivers	286,000 lb.
Weight on leading truck	29,500 lb.



Locomotive of the 2-10-2 Type Designed for Yard or Road Service

brick arch. The design is such that the back tube sheet can be removed without disturbing any of the firebox or combustion chamber sheets. An auxiliary dome placed behind the main dome is provided to facilitate inspection. This dome carries the safety valves and also a blow-off valve. The ashpans of the hopper bottom type and has an opening with a separate cover plate for passing grate bars into the firebox. The grates are of the box type shaking in four sections.

The frames are of cast steel. The top rail is 6 in. by 5¾ in., the depth being increased to 7 in. over the pedestals. The bottom rail is 6 in. by 4 in. and the cylinder fit 6 in. by 11½ in. The waist sheet T-bars are not riveted to the boiler but have a sliding fit against the boiler when hot. As the service in which these locomotives will be used made good curving qualities necessary the main tires were made flangeless. An engine truck of the inverted rocker type was applied and 4¾ in. motion each side of the center was provided in the trailing truck. This construction enables the locomotives, in spite of their long wheel base, to take 16-deg. curves.

Weight on trailing truck	51,500 lb.
Weight of engine and tender in working order	537,000 lb.
Wheel base, driving	23 ft. 0 in.
Wheel base, total	41 ft. 2 in.
Wheel base, engine and tender	71 ft. 6 13/16 in.

Ratios

Weight on drivers ÷ tractive effort	4.25
Total weight ÷ tractive effort	5.46
Tractive effort × diam. drivers ÷ equivalent heating surface*	659
Equivalent heating surface* ÷ grate area	79.9
Firchcox heating surface ÷ equivalent heating surface* per cent.	5.70
Weight on drivers ÷ equivalent heating surface*	44.5
Total weight ÷ equivalent heating surface*	57.2
Volume both cylinders	24.4 cu. ft.
Equivalent heating surface* ÷ vol. cylinders	263
Grate area ÷ vol. cylinders	3.29

Cylinders

Kind	Simple
Diameter and stroke	29 in. by 32 in.

Valves

Kind	Piston
Diameter	15 in.
Greatest travel	6½ in.
Outside lap	1½ in.
Inside clearance	0 in.
Lead in full gear	¼ in.

Wheels

Driving, diameter over tires	63 in.
Driving, thickness of tire	12 in.
Driving journals, main, diameter and length	12 in. by 12 in.
Driving journals, others, diameter and length	11 in. by 12 in.
Engine truck wheels, diameter	30½ in.

Wheels (Continued)

Engine truck wheels.....	6½ in. by 12 in.
Trailing truck wheels, diameter.....	45 in.
Trailing truck wheels, diameter.....	3 in. by 14 in.

Boiler

Style.....	Wagon top
Working pressure.....	185 lb. per sq. in.
Outside diameter of first ring.....	96 in.
Firebox, length and width.....	120½ in. by 96 in.
Firebox plates, thickness.....	Side, back and crown ¾ in.; tube, ½ in.
Firebox, water space.....	5 in.
Tubes, number and outside diameter.....	229—2¼ in.
Flues, number and outside diameter.....	43—5½ in.
Tubes and flues, length.....	22 ft. 0 in.
Heating surface, tubes and flues.....	4,311 sq. ft.
Heating surface, firebox.....	366 sq. ft.
Heating surface, total.....	4,677 sq. ft.
Superheater heating surface.....	1,162 sq. ft.
Equivalent heating surface.....	6,420 sq. ft.
Grate area.....	80.4 sq. ft.

Tender

Tank.....	Water bottom
Frame.....	Cast steel
Weight.....	170,000 lb.
Wheels, diameter.....	33 in.
Journals, diameter and length.....	6 in. by 11 in.
Water capacity.....	9,000 gal.
Coal capacity.....	15 tons

* Equivalent heating surface = total evaporative heating surface + 1.5 times the superheating surface.

† Includes archbride and combustion chamber heating surface.

TRAIN ACCIDENTS IN MAY¹

The following is a list of the most notable train accidents that occurred on the railways of the United States in the month of May, 1917.

Collisions

Date	Road	Place	Kind of accident	Kind of train	Kil'd	Inj'd
9.	Phila. & Reading.....	Frackville.	rc	F. & F.	1	1
10.	Baltimore & Ohio.....	Cove Run.	rc	F. & F.	3	4
†13.	St. Louis-S. F.....	Vinita.	xc	P. & F.	2	0
	N. K. & T.....					
19.	Louisville & N.....	Wheelerton	rc	P. & F.	1	1
22.	Baltimore & Ohio.....	Irving.	rc	F. & F.	1	3
29.	L. & Hend's'n & St. L.	Baskett.	bc	F. & F.	3	0

Deraillments

Date	Road	Place	Cause of derailment	Kind of train	Kil'd	Inj'd
1.	Pennsylvania.....	Leetonia.	d. switch	P.	0	1
2.	Ach., T. & S. F.....	Holbrook.	boiler	P.	1	2
7.	Pennsylvania.....	Arcola, Ill.	b. rail	P.	0	0
10.	Taahash.....	Bonfils.	.....	F.	1	1
†12.	C. C. C. & St. Louis.	Twin Grove.	.....	F.	0	0
13.	W. Pacific.....	Gerlach.	unx	F.	..	..
24.	Baltimore & Ohio.....	Mineral, Ohio.	b. truck	P.	..	14
29.	Louisville & N.....	Eminence.	unx	P.	0	9

The trains in collision near Frackville, Pa., on the ninth were southbound freights. One trainman was killed and one was injured. The leading train had been stopped and was not well protected by flag.

The trains in collision at Cove Run, W. Va., on the 10th were a wrecking train, which had stopped at a water station, and a through freight, the freight running into the rear of the wrecking train. Three trainmen were killed and four were injured. The collision is attributed to insufficient flagging combined with poor judgment on the part of the engineman of the freight.

The trains in collision at Vinita, Okla., on the 18th were a passenger train of the St. Louis-San Francisco and a freight of the Missouri, Kansas & Texas, the passenger running into the freight at the crossing of the two roads. Two passengers were killed. The passenger train had approached the crossing at uncontrollable speed because the engineman had left his cab in order to avoid being scalded by steam from a ruptured pipe.

The trains in collision near Wheelerton, Tenn., on the morning of the 19th, were southbound passenger No. 1, and southbound freight No. 73, the passenger running into the rear of the freight which had been stopped preparatory to entering a side track. The engineman of the passenger train was killed and the fireman injured. Five cars of the freight train and the two leading cars of the passenger train were wrecked. The cause of the collision was failure of the flagman of the freight to properly protect his train.

The trains in collision at Irving, W. Va., on the 22nd were an eastbound wrecking train and an eastbound freight, the wrecking train running into the rear of the freight. One employee was killed and three were injured. The collision was due to some inefficiency or misunderstanding in regard to the flag-protection of the work train.

The trains in collision near Baskett, Ky., on the 29th were westbound freight No. 163 and eastbound engine No. 23 without a train. Engine 23 was wrecked. One engineman and both firemen were killed. The men in charge of the westbound train overlooked an order and ran past the appointed meeting station.

The train derailed at Leetonia, Ohio, on the first about 3 a. m. was eastbound passenger No. 2. The engine and first four cars ran off the rails and the engine was overturned. The fireman was injured. The cause of the derailment was a loose movable point frog, the rod connecting the frog to the interlocking machine having been broken.

The train derailed near Holbrook, Ariz., on the second was westbound passenger No. 7, drawn by two engines. The leading engine was wrecked by the explosion of its boiler and the other engine and the mail car and the baggage car were ditched. One fireman was scalded fatally and one engineman and one fireman were injured. The cause of the explosion was low water.

The train derailed near Arcola, Ill., on the evening of the seventh was an eastbound special passenger train carrying officers of the United States Government and their guests from France, Messrs. Viviani, Joffre and others. The train consisted of two locomotives and five steel cars. The tender of the second engine and the first car ran off, but the cars remained upright except the leading one, a combination car, which lay at an angle of 45 degrees. There were no serious personal injuries. The train was running at moderate speed—about 30 miles an hour, on a straight line—and the derailment was due to a broken rail; a square break, 7 ft. from the end.

The train derailed near Bonfils, Mo., on the 10th was a westbound freight. Four cars were ditched. The conductor of the train was killed and a brakeman was injured. Both of these men were in the cupola of the caboose, which was overturned.

The train derailed at Twin Grove, Ill., on the 12th of May was an eastbound freight, made up of cars of oil, running as No. 94. Five cars of oil were burnt up. The road was blocked 14 hours. The derailment is believed to have been due to the rocking of a car, allowing the flange of a wheel to mount the rail.

The train derailed at Gerlach, Nev., on the 18th was a westbound freight, of 30 cars of oil. The oil took fire and twelve cars were burnt up.

The train derailed at Mineral, Ohio, on the 24th was westbound passenger No. 3. The engine and four cars ran off the rails and one car fell off a bridge into a creek. Eleven passengers and three trainmen were injured, none seriously. The cause of the derailment was a breakage in one of the trucks of the tender.

The train derailed near Eminence, Ky., on the 29th was eastbound passenger No. 16. Two coaches were overturned and nine passengers were injured. The cause of the derailment was an unfastened switch; how it came unfastened has not been determined.

¹ Abbreviations and marks used in Accident List:

rc—Rear collision—bc, Butting collision—xc, Other collisions—b, Broken—d, Defective—un, Unforeseen obstruction—unx, Unexplained—derail, Open derailing switch—ms, Misplaced switch—acc, obst., Accidental obstruction—malice, Malicious obstruction of track, etc.—boiler, Explosion of locomotive on road—fire, Cars burned while running—P. or Pass., Passenger train—F. or Fr., Freight train (including empty engines, work trains, etc.)—Asterisk, Wreck wholly or partly destroyed by fire—Danger, One or more passengers killed.

Some Constructive Thoughts on Car Interchange

Mechanical, Financial and Operating Aspects Should be Considered in a System of Car Service and Interchange

By Samuel G. Thomson*

THE development of a proper system of car interchange and car service is probably one of the most important transportation problems before the country today. Several months ago the customary rules for car service and interchange were modified and greatly intensified through the combined efforts of the Interstate Commerce Commission and the larger railroads. Stringent regulations and a much higher per-diem rate were used to compel vigorous action along the line of individual ownership and prompt return of the car to its owner. This quickly developed the inherent weakness of our present-day interchange and car service system by greatly increasing empty mileage and consequently reducing the car supply at a time when an urgent increase was needed to meet war conditions. A complete reversal of practice was then instituted, entirely abandoning the individual ownership idea and establishing a general car pooling arrangement under centralized control. In this plan which is now in force, all cars are to be used for the best interests of the country regardless of the separate railroads and individual ownership. The question now arises whether or not our former interchange and car service rules, which considered the owner, will again be good enough for normal times after the war, or whether a combination of the individualistic and the pooling system should be developed.

Should we try then to determine how far the car which best serves the country can be made to best serve its owner's business? One might think generally that the best use of the car for the nation would result in its best use for the owner on account of economic laws, and it may be that a general interchange can be worked out in which such an ideal dual function will be approximated. However, the struggle of the separate railroads as individuals in the normal transportation competition of the country will be a force at work in the opposite direction from such an ideal service. The natural tendency will be to drift back again towards the "each-one-for-himself" rule of competitive business and to require the car to make its best showing for its owner as a business investment regardless of the showing that it makes for the country in general. The problem then may resolve itself into a vigorous effort to determine just how far the car can be made to perform its function after the war for the general service of the country, while at the same time performing its maximum service for its owner. Will the system be permitted to develop through normal business channels as a purely economic problem, or will it be determined on an ethical basis and be prescribed by law? This question is closely related to some of the principles of government ownership. Fortunately, however, argument in favor of the latter is rapidly losing force in this country, and it is to be hoped that this waning tendency will be effective in preventing legislators from interfering with the development of a car interchange best suited to all concerned, and also in preventing these same lawmakers from robbing the railroad of an equitable return from its business of selling transportation, the success of which is vital to the best interests of all the people.

An analysis of the practical problem seems to show three main aspects: Mechanical, financial and operating.

Mechanical Aspect.—An ideal interchange would require that all of such classes of cars as are not designed for special

local service or for certain districts, should circulate freely throughout the country regardless of ownership. This, of course, would involve standardization, which in any event and also for economical reasons should be accomplished sooner or later to as great a degree as possible. The railroads already have made some progress through the Master Car Builders' Association in reducing their mechanical practice to standards, and through the American Railway Association in the construction of a few sample standard cars. Little, however, has yet been accomplished in placing standard cars actually in service, such as would aid in the immediate development of a satisfactory interchange system; however, it is quite within the realm of possibility to start such a movement as would quickly lay the foundation for a successful and universal car pooling and interchange service. It is unnecessary to dwell on the various merits of standardization and the savings which would be realized by it in any system. This is probably the greatest fundamental requirement for the mechanical success of car interchange, and the railroads should be making still greater efforts to agree on the designs for several classes or standard types of cars such as could make their home anywhere, and which could be repaired promptly on any railroad without losing much time out of service and without the necessity of sending across the country for special material.

Financial Aspect.—The principle laid down by the American Railway Association—that each railroad is entitled to the possession of cars equal to its ownership—is right because it involves fundamental investment and business principles. That is, a railroad, as any other business concern, is entitled to receive liberal interest and an equitable return on the money which it invests in equipment. In the first place, the operation of a car should yield to the owning railroad interest on a sum equal to the original cost of the car plus the cost of any betterments. And again, the owner is also entitled to receive sufficient return to keep the car in repair and to set aside an adequate reserve fund to replace the car when it becomes obsolete. In addition to these three items, the owning railroad also should be allowed to realize from each car *wherever it happens to be used*, a business remuneration over and above the interest, repair and replacement costs—an amount equal to whatever would be a good average yearly earning for the car extending over prosperous and lean periods when there is a shortage and a surplus of cars. This is the car's contribution to the net earnings of the business enterprise in return for service rendered; and it is from this return in excess of the cost of the car to the road that the road is able to improve its transportation organism, to pay dividends, to keep its credit good and to induce more capital for further growth.

The most successful interchange, therefore, will necessarily return to the owner of the car, *whether he uses or loans it*, this interest on the investment, his cost of maintenance, a reserve for replacement, and a proper yearly earning. If it does not do this, there will be no inducement for railroads to improve or to increase their equipment to meet the growing needs of the country. In fact, a lack of such earnings, particularly when the car is loaned to other roads, might tend to reduce the amount of equipment; since, as now often happens due to certain traffic conditions, many roads would find that it paid better to use the other fellow's cars, thus throwing the burden on the "willing horse," who in turn

* Formerly superintendent of motive power and rolling equipment of the Philadelphia & Reading.

might finally decide that it did not pay to make investments for the benefit of others. This, of course, is on the basis that the cars were operated in a general pool without much penalty requiring their return to their owners.

Operating Aspect.—It would seem to be a desirable feature in car interchange to regulate the per-diem rate so that, when all items are provided for, including sums to cover interest, repair costs, depreciation and net earnings, it would be a slight advantage to the owner to have his car used on a foreign road. This would place a small penalty on the borrower and would encourage increases of equipment by preventing the excessive use of one road's equipment by another. During active periods when cars were in demand there would then be a natural or normal tendency for the car to automatically gravitate towards home, and yet the penalty for borrowing it would not be sufficiently high either to prevent its economical use temporarily on any road or to produce useless empty mileage in speeding it home. Thus, during busy times the owner would have the opportunity to do the greater portion of his rebuilding and extra heavy repairs. At the approach of slack times and during periods of surplus equipment the cars would all find their way home on account of the high cost to the borrower when they were not earning anything for him. In this way both in good and bad times the owner would have ample opportunity to keep his equipment in good order.

Any concrete plan for interchange and car service must naturally be developed by the "trying out" process. The first problem is to establish the proper principles and then to translate them by actual practice into a definite working arrangement controlled by the necessary regulations. A practical start might be instituted by the concerted action of some of the railroads towards standardization, in agreeing actually to put into service some standard cars of the same design. Another practical suggestion might be for the railroads to collect such data concerning the operation of their present equipment as would indicate about how much gross revenue each class or type of car is actually turning in. Perhaps a start might be made by using an average return for all cars, obtained by dividing the gross freight operating revenue by the total number of cars, not including the non-revenue producing equipment. Such an investigation might then be extended to determine the return from each general type of car separately, such as box, gondola, flat, stock, refrigerator, etc., or at least to collect such information as would permit the establishing of approximate ratios of earnings to be assigned to each of these different kinds of cars.

In this connection the railroads might make other practical studies of the cost of car operation and maintenance. The cost of operation might vary somewhat for the different classes of cars according to the nature of the business and the length of the train in which they were usually handled. The cost of maintenance would naturally vary considerably, and it would be an interesting study for the railroads to analyze or separate their freight-car-pool costs sufficiently to give them an estimate of their car costs by classes. Such information should prove interesting to any railroad as an accurate guide in buying new equipment, aside from any question of interchange. In regard to interest and depreciation, it would not be difficult to arrive at a fair valuation by classes, in order to determine the amount to be checked off from the gross receipts for these items. With the above data fairly well in hand, it would not be hard to show earnings to the operating manager in "real figures," which would be over and above interest, depreciation and his operating and maintenance costs. These would be the vital figures to be used in adjusting and setting an equitable per-diem rate.

The collection of such data would be too burdensome to become a part of the regular monthly statistics of the rail-

roads; but such analysis could be extended over certain sections or divisions during different periods so as to give good approximate results. The whole matter of the receipts and expense of a car, either on a general-average basis or by classes, would be a very good field of investigation for a committee of the American Railway Association.

The closer we are able to determine and to establish the correct principles of interchange, and the more carefully the statistical figures of present conditions are determined, the less complicated and the less troublesome will be the operation of the resultant system. The development should be rather towards an automatic than an arbitrary operation, and the car should yield its maximum earnings the year round. An equitable per-diem rate is the practical problem to be determined, based on accurate statistics, so that the car, wherever it might be used, would "earn its feed" and would also make an additional contribution to its owner for net earnings and for its own perpetuation.

The operating conditions of the various railroads, particularly those located in the different sections of the country, are so different and the occasional congestions of traffic are so variable that no system could always be entirely fair; but a system can be developed which will produce good averages and which has sufficient flexibility to meet unusual conditions. If, then, we assume for our proposed system that vigorous car service rules are to be enforced for loading and unloading, and that means have been developed for adjusting properly the per-diem rate applied to borrowed equipment, and that a reasonable amount of standardization had been attained, so that prompt repairs can be made on any railroad, then the car always will be busy turning its wheels with revenue freight during all periods when there is a demand for its service; and it seems that it will not be adding too much optimism to say that this may be accomplished without elaborate rules or expensive distributing and accounting agencies, and in such a way as to minimize empty mileage and to allow the car to be used to advantage wherever it happens to be for the best service of the community and the car owners.

WOOD PRESERVATIVE STATISTICS

The proceedings of the American Wood Preservers' Association for 1917 which have just been issued contain statistics regarding the quantity of wood treated and the preservatives used in the United States during 1916. These statistics were compiled by the Association in co-operation with the Forest Service of the United States Department of Agriculture. In 1916 a total of 150,522,892 cu. ft. of wood was treated by the 117 treating plants which were active during the year. This is 9,664,019 cu. ft., or 6.9 per cent more than was treated by the 102 plants which reported in 1915.

An increase of 383,783, or 2.5 per cent, was recorded in the number of cross ties treated during 1916 over the number reported in 1915, while the quantity of piling treated was more by 3,382,448 lineal ft., or 36.3 per cent. The largest increase occurred in the number of poles treated, which amounted to more than twice the number reported during the previous year. In only two of the seven classes of material covered by the report were decreases registered in the quantity treated. These items consist of construction timber and miscellaneous lumber and the amounts given fall short of the 1915 figures by 3,119,819 and 913,509 ft. b.m. respectively.

The quantity of preservatives used during 1916 amounted to 90,404,749 gal. of creosote and refined water-gas-tar, 26,746,577 lb. of zinc chloride, 5,675,095 gal. of paving oil and 582,754 gal. of miscellaneous preservatives. The amount of creosote and refined water-gas-tar used was 9,545,307 gal. greater in 1916 than in the year previous,

while a decrease of 6,523,027 lb. was recorded in the consumption of zinc chloride.

Approximately 48 per cent of the creosote used was imported as compared with 46 per cent the preceding year and over 60 per cent in all years previous to that date, the cost of the creosote ranging from 7½ to 13½ cents per gal. and that of zinc chloride from 6 to 9½ cents per lb.

A total of 37,469,368 ties were treated, of which 26,499,954 were sawed and 10,969,414 were hewed. Approximately 44.9 per cent of the ties treated were of oak, 28.1 per cent of yellow pine and 8.1 per cent of Douglas fir. The number of ties treated with creosote was 20,858,801 and with zinc chloride was 4,619,676, while the number treated with an emulsion of these two materials was 1,978,414. The average impregnation with creosote and refined water-gas-tar was 8.09 lb. per cu. ft. and with zinc chloride 0.50 lb. per cu. ft. Where the ties were treated with emulsion an average of 2.75 lb. of creosote and refined water-gas-tar and 0.48 lb. of zinc chloride were used.

Approximately 12,690,867 lineal ft. of piling was treated in 1916, mainly of yellow pine and Douglas Fir. Where creosote was used the average injection made was 14.36 lb. per cu. ft. and where zinc chloride was used 0.43 lb. per cu. ft. was injected.

STORAGE OF COAL*

The general breakdown in the system of distributing coal throughout the United States and Canada during the past 10 months emphasizes very forcefully the necessity of taking immediate action to perfect plans and arrangements for stocking coal during the spring and summer months. There is no question but that the practice of stocking coal will be the most effective method of equalizing the output of mines, and if the coal is stored at destination it is the most effective means of equalizing the power and car usage for the carriers.

One railroad in Southern Colorado stocks coal each summer, usually during June, July and August. The coal in that district is affected very little by weather, and ¾-in. bar screenings has been stored for an indefinite length of time, and has never shown signs of heating, although no special care has been taken to ventilate the storage piles or regulate their height. The practice on that road has been to store coal at coaling stations, it being unloaded and recovered with locomotive cranes equipped with grab buckets, and wherever possible the coal is picked up from the storage piles and placed directly on the engine tenders, thereby saving labor expense, as well as breakage, due to subsequent handling.

The extreme shortage which has existed in Canada during the past 10 months has, however, aroused the public to the point of working out better plans for their coal supply in the future. A movement is on foot in Toronto, Canada, to prosecute actively the development of the hydro-electric power in that province. Also a resolution is soon to be placed before the House of Commons at Ottawa, advocating a special inquiry into the possibilities of briquetting lignites for domestic and other purposes.

Not only does it appear that no progress has been made in providing up-to-date facilities for the handling of coal in storage by the great majority of consumers, but the present outlook indicates that consumers who are desirous of storing coal the present year will find extreme difficulty in supplying such needs.

The coal operators of Illinois and Indiana have been giving some thought and attention to the matter of subaqueous storage. The New Kentucky Coal Company has equipped a subaqueous storage plant near Kankakee, Ill. The pit in question is an old abandoned stone quarry that is uni-

form in depth, and the walls being of channel rock, it provides an ideal place for the storage of coal. There is an abundance of water, the quarry being fed by springs, so it is not necessary to pump the water into the pit. The expense for labor and material to equip this plant amounted to approximately \$20,000. Running along one side of the storage pit are the railroad tracks, equipped with two chutes leading down to the edge of the water. These chutes are 40 ft. long, and will accommodate the full contents of a drop bottom coal car. The plant is so equipped that the coal may be flushed out of the car and down the chutes by water pumped out of the pit by means of a large pump, located between the two chutes. The coal flows down into the pit, and as it piles up above water level it may be transferred to another point in the pit by a 10-in. centrifugal pump, operated by a 75-h.p. motor. The pipe line is carried to any desired part of the pit on pontoons, and the coal is forced through these pipes by hydraulic pressure. In reclaiming the coal the action of the pump is reversed, and the coal is transferred by suction from any point in the main pit to a small pit located along one side of the reservoir. This small pit is constructed of concrete walls, and as it fills up with the coal the water is forced over the edge and runs back into the main reservoir. Leading from this pit up to the railroad track is an ordinary flight conveyor elevator, equipped with perforated buckets. As the coal is hoisted out of the pit the water drains off and the coal is in about the same condition as ordinary washed coal when it is dropped into the car. It is estimated that the expense of putting the coal in and reclaiming it will not exceed 10 cents per ton; in fact, they feel confident that the cost will not reach that figure.

As to the absorption of water by reason of the submersion of coal, the following statement by Oscar W. Palmerberg, B. S., analytical and fuel engineering chemist, New York, is of interest: "All coals absorb water to a greater or lesser extent. Anthracite coal, after being dried, may absorb ½ per cent; bituminous 1 per cent or more, and the sub-bituminous and lignite coals as much as 10 per cent and more. This moisture may be called that which is retained by capillary attraction, and is not apparent to the touch, and the coal may appear for all purposes 'bone dry.' The amount of water which the coal will hold as surface water depends upon the physical nature of the coal. The finer the particles, the greater the surface and therefore the larger the amount of water.

"As to the storing of coal under water, the coal does not undergo any change, and the water retained after submersion may not be any greater than before if a reasonable amount of time is allowed for drainage and exposure to air. Here again the physical nature of the coal will determine what amount of water the coal will absorb after submersion and drawing for consumption."

The committee is of the opinion that systematic co-operation and organization, as between the producers, carriers and consumers, is necessary in order to promote the storage of coal, and there is no question but that the carriers will have to start this movement by making permanent arrangements for storing coal at fuel stations.

The report was signed by: C. G. Hall, chairman; Carl Scholz, A. H. Davies, J. B. Hutchinson, R. E. Rightmire, A. P. Wells, Herbert Woods, and S. L. Yerkes.

DISCUSSION

The storage of coal is especially important this year to anticipate any difficulty in securing a supply next winter. Some roads have arranged to use industrial tracks which are now idle for storage purposes. Coal should be stored in dry locations. Large sizes are to be preferred and slack should be screened out if possible. Coals which break up when exposed to weather and those with a high sulphur content are

* Abstract of a committee report presented at the 1917 convention of the International Railway Fuel Association.

dangerous to store. Flues extending to within two or three feet of the bottom of the piles are used to note the temperature of the coal and in case it heats the pile is worked over. Illinois coal is stored to a depth of 15 feet without trouble from spontaneous combustion and Pittsburgh coal has been stored in piles 30 feet high. To get the best results when using coal which has been stored, locomotives should have the draft adjusted especially for the fuel.

KNIFE-EDGE MATERIALS AND STRESSES*

By H. L. Van Keuren

Assistant Physicist United States Bureau of Standards.

In the field of weighing devices there is probably no subject on which so little is recorded as that of knife-edges. It is the purpose of this discussion to call attention to certain requirements of the knife-edges of railroad track scales; the materials that have been employed and the allowable stresses for use in their design. It is hoped that the suggestions offered herein may act as a stimulus toward the collection, preservation and application of more definite data than is now available on the subject.

REQUIREMENTS OF KNIFE-EDGES AND BEARINGS

A prerequisite consideration for a knife edge is that it retain as far as possible its contact edge. To this end it must have a combination of properties among which are high ultimate strength with an elastic limit close to the ultimate strength, a high resistance to penetration and abrasion and a moderate degree of ductility and toughness. A high elastic limit close to the ultimate strength embodies the ability of the material to return to its original shape after having been strained or stretched nearly to its breaking point. A knife-edge or bearing should have the property of hardness in order that the temporary deformation when in a condition of stress below the elastic limit will be small; and in order that it will resist abrasion.

It appears to be the practice to construct knife-edges in accordance with the methods common in making tools for cutting very hard materials and there is a tendency to leave knife-edges glass hard. If the ductility of the material has been thus sacrificed for hardness, it is very apt to crack off at the contact edge when in service. In this connection there has come under observation a case where a glass-hard point bearing would not hold up under a load that was applied practically without impact, but when the temper of the contact point was drawn slightly it held without trouble. Besides the property of hardness, a knife edge should not be so brittle as to fracture as the result of an impact blow, but it must be tough and ductile in order to withstand the shocks occasioned in service.

In connection with the requirements of knife-edges and bearings, it may not be without interest to consider the probable occurrence when a knife-edge and bearing are imposed under load. Referring to Fig. 1, which shows the familiar form of knife-edge and bearing it is self-evident that the knife-edge E cannot sustain on a line contact the load imposed by the bearing B. Fig. 2 shows a hard bearing engaged with a soft knife-edge. Fig. 3 shows a soft bearing engaged with a hard knife-edge. Fig. 4 shows a bearing and its opposing knife-edge of the same material. It appears logical to allow the bearing to be deformed as much as the knife edge, as is indicated in Fig. 4 in order that the elastic properties of both parts may be utilized in the temporary deformation required to support the load. Therefore, the practice of making the bearing of the same material with the same treatment as the knife-edge seems justifiable, and in what follows the data given in regard to knife-edges might well be applied to bearings.

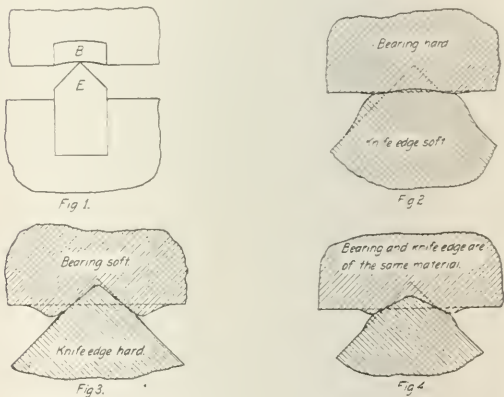
Another requirement that would be desirable, particularly in knife-edges of railroad track scales or other scales that are installed out of doors is that the material be non-corrosive.

KNIFE-EDGE MATERIALS

In the construction of knife-edges and bearings of track scales the choice of materials has been confined practically to steels. Until recently carbon steel was employed almost exclusively, but at present the use of some alloy steels is attracting special attention.

The properties of simple carbon steel depend almost entirely upon the amount of carbon content, which varies from about 0.10 to about 1.5 per cent. According to information furnished by scale manufacturers the practice has been, when carbon steel is used, to employ a steel containing about 1.20 per cent carbon which when annealed will have an ultimate strength of 90,000 pounds per square inch and a Brinell hardness of 170. With heat treatment the ultimate strength is approximately 120,000 pounds per square inch and the hardness 400.

Chromium and chromium-vanadium steels that have been employed in knife-edge construction may be obtained on the market under the name of "special Alloy Knife-edge and Pivot Steel." They are very hard and tough and the com-



The Relation Between Knife-Edge Materials and Deformations.

mercial grades as secured from the manufacturers in the annealed condition and in this state are supposed to have the following properties:

Ultimate strength	100,000 lb. per sq. in.
Elastic limit	70,000 lb. per sq. in.
Per cent elongation in 2 in.	25
Per cent reduction in area.....	50

Heat treatment will approximately double the strength and hardness without altering the ductility.

High speed steel has been used with success as a knife-edge material. There is nothing particular about it that would indicate its superiority over a chromium or a chromium-vanadium steel except the fact that it has been used with success.

A combination of nickel and chromium as alloying elements has apparently not been employed for knife-edges, yet nickel chromium steels have been developed that have, perhaps, combinations of physical properties in a higher degree than almost any other form of steel. In order to show the possibilities of a nickel chromium steel, the following example is cited. When quenched in oil from a temp-

* Abstracted from a paper presented before the last convention of the National Scale Men's Association at Chicago.

erature of 1472 deg. F. A specimen developed the following properties:

Ultimate strength	292,280 lb. per sq. in.
Elastic limit	289,440 lb. per sq. in.
Per cent elongation	9.5
Per cent reduction in area	36.3
Brinell hardness	425.

The extremely high ultimate strength and elastic limit developed in this steel together with an exceptional degree of ductility for a hardened steel suggests that the material is at least worthy of trial as a knife-edge material.

There has recently been introduced commercially a product known as stellite, which appears to offer some unique possibilities in the way of knife-edge construction. Stellite, since it contains iron only as an impurity is not a steel. It is an extremely hard substance, which is practically immune from corrosion, even under the action of most acids; and it would therefore be very desirable for use as knife-edges of scales that are exposed to severe adverse conditions tending to cause corrosion. It requires no heat treatment and is so hard that it cannot be tooled. It is therefore, usually furnished in bars cast to approximately the desired shape and it is brought to the final shape by grinding. Stellite is rather brittle and is not adapted to resisting transverse strains, a fact, that would necessitate a knife-edge of stellite being supported throughout its entire length.

ALLOWABLE DESIGN STRESSES FOR KNIFE-EDGES

In considering the stresses that may be allowed in the design of knife-edges of railroad track scales, the most important consideration is the stress per lineal inch of contact. The allowable stress for the transverse bending of knife-edges is of relatively minor importance as in a well-designed scale the knife-edges are reinforced so as not to be subject to transverse bending, except where the load carried by the knife-edge is relatively small.

In the absence of experimental data, the stress per lineal inch of contact that may be allowed in the design of knife-edges, in order that they may last for a reasonable length of time, can be determined by judging from the performance of knife-edges in scales. In judging the performance of the knife-edges of any installation there are two considerations of prime importance: The actual capacity of the scale and the service required of it. Attention is called to the fact that scales have been greatly over-rated, that is, the nominal capacity as represented by the capacity available on the beam equipment is in nearly every case greatly in excess of the weight of the largest cars normally weighed over the scale.

In addition to the weight of the cars weighed it is necessary to consider the number of cars weighed over the scale. It is evident that the knife-edges and other parts of a scale over which but a few cars per day are weighed, will with proper care and protection have a considerably longer life than a similar scale, which is called upon to weigh several hundred cars per day.

It appears from the data available that a stress of 4,000 lb. per lin. in. of knife-edge contact for carbon steel for scales in heavy service is as high as may safely be assumed at the present time. It seems justifiable, however, that some of the alloy steels might be used at a stress higher than 4,000 lb. per lin. in. However, for scales in heavy service a stress of 6,000 lb. per lin. in. is probably as high a value as could be justified even for the most suitable alloy steels. For scales over which but a few cars per day are weighed, a stress per lineal inch of knife-edge contact of not over 5,000 lb. for carbon steel, and of not over 7,000 lb. for the best of the more suitable alloy steels is probably the upper limit which should be attempted.

A SUGGESTION TO COMMUTERS.—When you stay in the office after hours don't run for that 7:20 train until you have made sure that the railroad hasn't taken it off.

MOBILIZATION OF THE NATIONAL GUARD

The mobilization of the National Guard preparatory to its mustering into the federal service began on Sunday under an executive order in eleven states. The forces ordered out are the first of three increments, of which the others will follow on July 25 and August 5. The first movement of the guardsmen to the number of approximately 125,000 will be from local armories to state mobilization camps, from which they will be sent to training camps located principally in the south, although in some cases they may be sent direct. Transportation arrangements for the movement to state camps will be handled by the local railroads and quartermasters. The later movement to the training camps will be directed from Washington by the War Department and from the railroads' standpoint by the central bureau of the Railroads' War Board. The assignments of the National Guard troops to the training camps were announced by the War Department as follows:

To Charlotte, N. C., division 5, from the States of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut; to be called into Federal service on July 25.

To Spartanburg, S. C., division 6, from the State of New York; to be called into Federal service on July 15.

To Augusta, Ga., division 7, from the State of Pennsylvania; to be called into Federal service on July 15.

To Anniston, Ala., division 8, from the States of Virginia, Maryland, Delaware, New Jersey, and the District of Columbia; to be called into Federal service on July 25.

To Greenville, S. C., division 9, from the States of Tennessee, North Carolina, and South Carolina; to be called into Federal service on July 25.

To Macon, Ga., division 10, from the States of Alabama, Georgia and Florida; to be called into Federal service on August 5.

To Waco, Tex., division 11, from the States of Wisconsin and Michigan; to be called July 15.

To Houston, Tex., division 12, from the State of Illinois; to be called July 25.

To Deming, N. Mex., division 13, from the States of North Dakota, South Dakota, Nebraska, Iowa, and Minnesota; to be called July 15.

To Fort Sill, Okla., division 14, from the States of Kansas and Missouri; to be called August 5.

To Fort Worth, Tex., division 15, from the States of Texas and Oklahoma; to be called August 5.

To Montgomery, Ala., division 16, from the States of Ohio and West Virginia; to be called July 15.

To Hattiesburg, Miss., division 17, from the States of Indiana and Kentucky; to be called August 5.

To Alexandria, La., division 18, from the States of Arkansas, Mississippi, and Louisiana; to be called August 5.

To Linda Vista, Cal., division 19, from the States of California, Utah, Nevada, Colorado, Arizona and New Mexico; to be called August 5.

To Palo Alto, Cal., division 20 from the States of Washington, Montana, Idaho, Oregon and Wyoming; to be called on July 25.

In addition to the camp sites previously mentioned in these columns, Hattiesburg, Miss., and Alexandria, La., have been selected and Charlotte, N. C., has been substituted for Fayetteville, N. C., making a total of 16 in all.

THE RAILWAYS OF WESTERN AUSTRALIA.—The Government railways of Western Australia comprise 3,352 miles of railway and 334 miles of sidings now open on the 3 ft. 6 in. gauge, the capital cost of which has been £17,118,195 (\$83,194,428), including £3,898,856 (\$18,948,440) for rolling-stock. Of the railway mileage 106 miles are double-track. The first government line opened in the state was that from the coast at Geraldton to Northampton, a length of 34 miles.

REDUCING ERRORS IN HANDLING L. C. L. FREIGHT

During the eight months from April, 1916, to November, inclusive, the number of errors made in the handling of l.c.l. freight chargeable to station performance on the Eastern district of the Northern Pacific was reduced 11 per cent in spite of an increase of 36 per cent in the tonnage of this class of freight. This performance was the result of a campaign inaugurated by the Bureau of Efficiency having for its purpose the reduction of loss and damage claims arising from the handling of this class of business. The campaign was confined to the Eastern district at the beginning, this territory including five operating divisions with 2,530 miles of line and 300 open freight stations, handling a total of over 86,000 tons l.c.l. freight in November. There has been a relative decrease in the number of errors of this class on each division during this period and an actual decrease on all but one division. Likewise the number of errors per 100 tons of l.c.l. freight handled has decreased on all but one division, the net reduction for the district being 36 per cent, as shown in the table. This campaign is now being extended to other parts of the system.

tinuously and checks the loadings and the methods of handling freight at stations and educates the employees regarding proper methods. At the more important stations periodical meetings are attended by the entire force of station and yard employees and also by those from adjacent stations. At these meetings different phases of the subject of claim prevention are discussed and co-operation is encouraged in every practicable manner.

Investigations are confined to shipments valued at five dollars or more; this in the belief that if conditions leading to possible claims on these shipments are corrected the others will be taken care of automatically. Slightly over one-half of all the items exceed five dollars. The damages resulting from defective equipment are brought to the attention of the mechanical superintendent for remedy. All shortages resulting from pilferage and robbery are referred to the chief special agent. Errors on the part of shippers are brought directly to their attention either through the traffic department or representatives of the Western Weighing and Inspection Bureau. In this way action is taken on every inefficiency involving over five dollars in amount.

The report made to the division superintendent each month shows the total number of errors charged to each

PERFORMANCE SUMMARY OF FREIGHT CLAIM PREVENTION DEPARTMENT
FOR APRIL, 1916, AS COMPARED WITH NOVEMBER, 1916.

DIVISION	TONS FORWARDED LCL FRT. HANDLED			STATION ERRORS			PER CENT OF STATION ERRORS PER 100 TONS FWD. FRT. HANDLED		
	April	November	Increase or Decrease	April	November	Increase or Decrease	April	November	Increase or Decrease
Lake Superior	12275	19999	.63 Inc.	66	94	.42 Inc.	.64	.47	.07 Dec.
Saint Paul	30653	36987	.21 Inc.	235	206	.12 Dec.	.77	.56	.21 Dec.
Minnesota	3936	7331	.86 Inc.	69	54	.22 Dec.	1.75	.74	1.01 Dec.
F a r g o	6484	4961	.23 Dec.	95	79	.17 Dec.	1.47	1.59	.12 Inc.
D a k o t a	9965	17085	.71 Inc.	140	101	.28 Dec.	1.40	.59	.81 Dec.
M a n d a n				45	47	.04 Inc.			
T-O-T-A-L	63313	86363	.36 Inc.	650	581	.11 Dec.	1.03	.67	.36 Dec.

21 % Increase in O S & D's Issued

79 % Increase in number of O S & D's Investigated

A Summary of the Freight Claim Performance by Divisions

The fundamental feature of the campaign is the thorough investigation of all errors to determine their cause and to endeavor to eliminate them in the future. An O. S. & D. investigator has been placed in each division superintendent's office. He receives a copy of every O. S. & D. report issued by agents, each of which he investigates to ascertain the cause. When the investigation is complete the file is forwarded to the office of the Bureau of Efficiency at St. Paul, where it is reviewed by an expert and if approved is entered on the work sheets of this bureau.

A monthly report of this work sheet is prepared and sent to all officers concerned. This sheet shows the number and character of the errors charged to each station and also the names and positions of the parties at fault wherever it is possible to place the responsibility. If the error arises from a "man failure," educational methods are applied, while if there is a case of improper methods or inadequate facilities the necessary attention is given to their improvement.

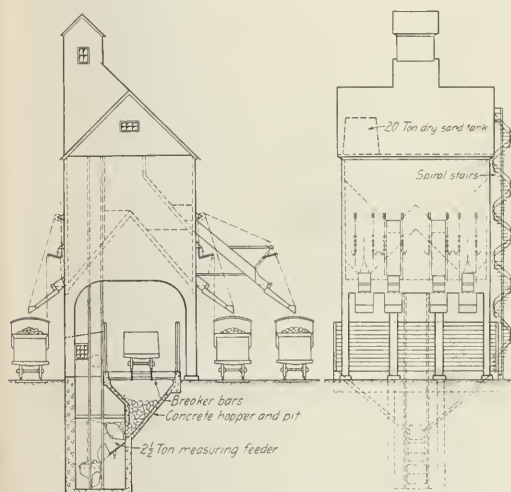
A traveling representative is also employed on each general superintendent's district who rides freight trains con-

station, classified under 11 heads chargeable to stations and 19 classes not chargeable in this way. The stations are also ranked on this report in the order of their performance. After the superintendent has had an opportunity to analyze his monthly reports he writes letters to the agents, trainmen and others interested in his territory informing them of the previous month's performance. Where an employee is charged with an unusual number of errors his attention is called to this fact and he is warned to improve his methods.

In addition to investigating all items of over five dollars all loss and damage claims involving settlements of \$15 or more are referred to the Bureau of Efficiency for review and record and for such further educational action as may be considered advisable. Up to the present time this freight claim preventive work has been confined to l.c.l. shipments, but it is expected that ultimately it will be expanded to include all shipments. As a result of the Bureau's activities a reduction has been effected in the amounts paid for freight claims, which are now but eight mills per dollar of freight earnings as compared with 1.25 cents previously.

A NEW COALING STATION ON THE ILLINOIS CENTRAL

A new reinforced concrete coaling station of 600 tons capacity was recently placed in service at Effingham, Ill., on the Illinois Central to replace an old timber structure of the trestle type. The new coaling station is the first reinforced concrete plant to be installed on the Illinois Central, although several plants of the same type constructed of timber have been in use on that road for some time. While serving as a terminal coaling station for the branch of the Illinois Central extending from Effingham to Indianapolis, it is essentially a way station, serving two main tracks and a passing track on the main line between Chicago and New Orleans, and delivering coal to all freight trains operating on the engine district between Champaign, Ill.,



Side and End Elevation of the Plant

and Centralia. The average daily consumption is from 200 to 250 tons, from which it is obvious that the capacity of the new layout allows for a considerable increase in the traffic.

The plant consists essentially of a bin 33 ft. square, supported on eight columns arranged in two rows along the two sides of the structure. The floor of the bin is shaped like a gable roof to deflect the coal to the outlets along the two sides and is supported on concrete girders spanning from column to column across the width of the bin. As shown in the drawing, the southbound main track cannot be served with coal from the bottom of the bin. To overcome this a separate coal pocket was provided with its bottom at a sufficient elevation to give the extension spouts the necessary pitch to reach the outer track. This upper pocket is 11 ft. 2 in. wide and occupies the full length of the bin. The outlets for this pocket are 12 ft. above those for the main pocket. The lower or main pocket of the bin is not subdivided and occupies the entire bin space except for the hoistway approximately 9 ft. square, through which the coal is hoisted to the top of the structure.

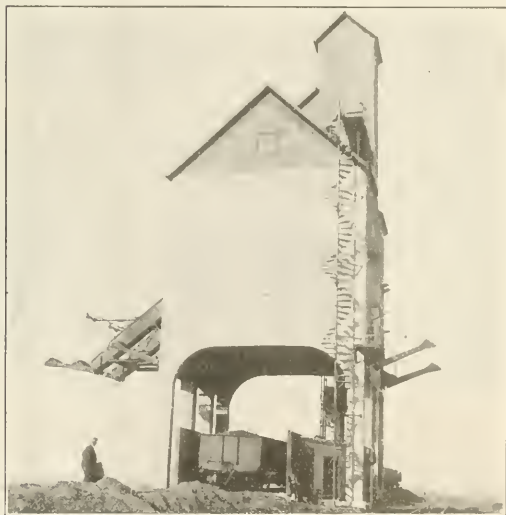
The track hopper to receive the coal from cars is located below the ground level directly under the bin. The bottom of the bin and the columns which support it give sufficient clearance for the operation of cars through the structure on a track passing over the hopper. The coal is delivered from the track hopper into an elevator bucket of 2 1/2 tons capacity

by means of a Schraeder measuring feeder which operates automatically with the movement of the bucket. The operation of a hoist bucket is also automatic. It is raised and lowered by a Rands electric traction hoist which reverses direction when the bucket reaches the top or bottom of a shaft through the agency of a Cutler-Hammer automatic controller.

The arrangement of spouts at the top of the bin is such that the coal falls directly on the partition at the back of the upper pocket. In consequence most of the coal goes into the latter until it is filled, when the heaping up of the coal causes it to fall into the lower pocket.

The plant is built entirely of non-combustible materials. The house covering the top of the bin and the hoist house at the track level have structural steel frames covered with No. 20 gage black corrugated iron. A metal spiral staircase provides means of communication between the ground level and the headhouse. The construction of the new coaling station was started in August, 1916, and was well under way when a fire on November 19 destroyed the old timber coal dock. Temporary coal pockets, filled by a grab bucket, handled by a Brownhoist locomotive crane, were installed to serve until the new station could be completed. Special efforts were made to hurry the work on the new station and it was placed in service about January 15, 1917.

It is expected that the new coaling station will serve coal to locomotives at a material reduction from the cost of operating the old plant which averaged from six to seven



Coaling Station from the Passing Track Side

cents per ton. The new station has not been in use a sufficient length of time to permit of the compilation of cost data, but results secured on the Illinois Central with stations of the same type indicate that the cost of handling coal will not exceed three cents per ton including the cost of breaking up lumps of coal to pass them through the breaker bars covering the track hopper. The plant was built by the Roberts & Schaefer Company, Chicago, under the general direction of A. S. Baldwin, chief engineer of the Illinois Central.

RUSSIA TO SAVE DAYLIGHT.—All clocks in Russia were advanced one hour on July 14 under the daylight saving plan which has been adopted by the provisional government.

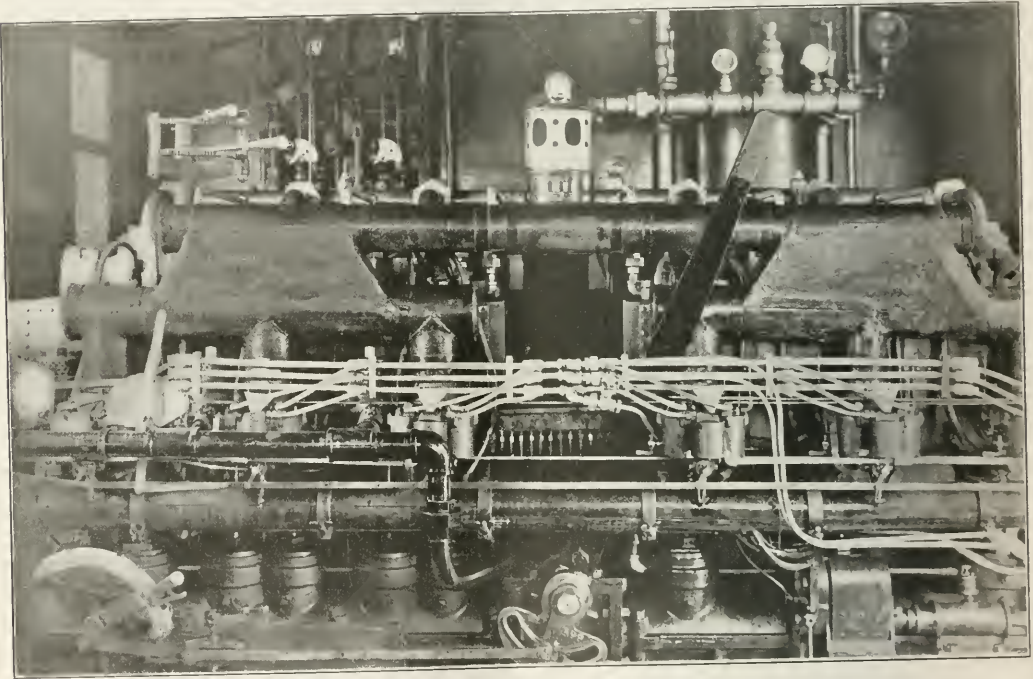
KEROSENE AS FUEL FOR RAILWAY MOTOR CARS

The McKean Motor Car Company, Omaha, Neb., has developed a method for using kerosene instead of gasoline as fuel in its railway motor car engines. Cars operating with this fuel have been in use for about two months and the results are reported to be satisfactory in all respects. The use of kerosene effects a saving of 74 per cent of the cost of fuel as compared with gasoline and a reduction in the cost of operation per train-mile of 31 per cent. There is no appreciable increase in the cost of maintenance, a little more attention from the motorman being all that is required.

The successful use of kerosene is the result of a series of

is substituted. The trouble which is sometimes encountered with the lubrication of internal combustion engines when kerosene is used as a fuel has been satisfactorily overcome.

The first car equipped to use gasoline was a steel passenger car weighing 65,000 lb. It has a 200-horsepower, 6-cylinder engine, of the variable speed type. At the present time it is in branch line local passenger service, making an average of 210 miles a day. Since kerosene has been substituted for gasoline on this run there has been an increase of from 25 to 50 per cent in the mileage per gallon of fuel. The power developed on grades is materially increased and the motorman has expressed satisfaction on account of the greater ease in making the scheduled running time. It is felt that the slight additional complication of parts and the increase in



Engine of McKean Motor Car Which Uses Kerosene as Fuel

experiments carried on during the past five years by this company. Various grades of distillate have been used for about two years and the latest developments have made it possible to go a step farther and utilize kerosene. The operation of kerosene carburetors was found to be unsatisfactory. In the present design one carburetor of the multiple jet type is applied to each cylinder. The kerosene is atomized and delivered to the cylinder with a mixture of tempered air, there being eight nozzles for each cylinder. When running light only one nozzle per cylinder is used, the others coming into action when the throttle is opened. Through the use of one carburetor for each cylinder the manifold has been eliminated. The supply of hot and cold air can be regulated and for use on heavy grades water jets are provided. Kerosene does not mix with air as readily as distillates or gasoline, but the use of tempered air and mechanical means of regulating the quantity as well as atomizing the fuel make it possible to secure the proper explosive mixture under all conditions. To avoid undue complications in control the engine is started on gasoline and after it is in motion kerosene

the cost of the apparatus is insignificant as compared with the economy which has been obtained by the use of kerosene.

SYNDICATE MAY BUY CHACO RAILWAY LINE.—According to press despatches, an American syndicate has offered to purchase the Chaco railways from the Argentine government for the sum expended for their construction and to undertake to extend the system into Bolivia. The construction of the Chaco railways was undertaken by the Argentine government to exploit the vast territories of the Chaco and Formosa sections, a large portion of which is still covered with unexplored forests. With that object a comprehensive railway scheme was drawn up in 1905 and the work on the lines begun. They consist of two penetration railways, starting from the banks of the Río Paraná, and running parallel to its larger tributaries. The activity displayed in both Argentina and Bolivia in the extension of railway lines into the Gran Chaco is considered as marking this vast, unsettled territory in the center of the continent as area in which great development will be witnessed within the next few years.

General News Department

According to a recent announcement of the Chicago & North Western, 79 employees have entered army or navy service. There have been enlistments from practically all departments.

Representative Adamson of Georgia, chairman of the House Committee on Interstate and Foreign Commerce, has introduced in Congress a bill to provide for the exchange of railroad transportation for advertising.

The Lower House of Congress on July 13 voted to insist on the House amendments to the freight priority bill, as passed by the Senate; and Representatives Adamson, Sims and Esch were appointed conferees on behalf of the House. The Senate had previously appointed its conferees.

During the conferences between representatives of the steel companies and the government officers in Washington last week Secretary of Commerce Redfield perfected an arrangement with the steel manufacturers by which steel will be more promptly furnished for the completion of railway cars and locomotives now being built, and which have been somewhat delayed because of the preference given to orders of the government for steel.

A meeting of operating officers and watch inspectors of the Missouri, Kansas & Texas lines was held at Dallas, Tex., on June 26 and 27. Matters pertaining to watches of employees subject to time service regulations, the maintenance of watch records, and the rendition of proper reports were considered. Among those who participated in the discussion were Webb C. Ball, general time inspector, and W. F. Hayes, superintendent of time service.

The Baltimore & Ohio announces another anti-spitting day. Slips will be placed in every seat of day coaches, pointing out the menace to public health in the persistence of this practice, and embodying a polite request that public opinion itself put the stamp of its disapproval upon the obnoxious habit. It is not easy for trainmen openly to call offenders' attention to the rule, therefore the slips are adopted as affording the best medium of counteracting the spitting evil.

Alton B. Parker, acting as arbitrator, has decided that the New York, New Haven & Hartford shall pay to Charles S. Mellen, former president of the road, \$95,000 to reimburse him for expenses incurred in law suits growing out of his connection with the railroad. Judge Parker decides that Mellen is not entitled to \$60,000 for two years services as adviser since he retired from the presidency. Soon after Mr. Mellen left the road he wrote a letter saying that he had decided not to accept the directors' offer of \$30,000 a year; and the arbitrator decides that he must abide by this waiver.

An Advisory Committee on Terminal Facilities has been appointed by the general munitions board of the Council of National Defense to promote the orderly, rapid and careful loading of vessels with munitions and supplies required by our armies in Europe and by the Allies. Francis L. Stuart, of New York, formerly chief engineer of the Baltimore & Ohio, is chairman of the committee, which will at once begin consideration of these problems. It is expected that new terminals will be established at the principal ports, especially for the assembling and loading of supplies designed for the overseas forces, and those of the Allies, so as to relieve existing terminals, with a view to preventing freight embargoes and congestion.

A controversy between the railroads and the shopmen employed on the southeastern railroads, involving about 25,000 men, who demanded an increase of 10 cents an hour and an eight-hour day, has been referred to the United States Department of Labor for mediation, with an agreement on the part of both the employers and the men to abide by the decision of the Secretary of Labor in case the conciliators of the department are not able to effect a settlement. The railroads offered increases amounting to six cents an hour, with an eight-hour day, for about 90 per cent of the men involved, but this was not accepted by the men

and a strike had been called, to become effective last Thursday, when the mediation agreement was reached. The wage increase will amount to about \$1,000,000 a year, for the roads involved, for each cent per hour; six cents an hour would mean six million dollars.

Henry W. Hodge, a member of the New York State Public Service Commission, First district (New York City), is going to France as a bridge engineer for the government, having accepted a commission as major in the Engineering Reserve Corps. After a conference with the governor, Mr. Hodge declined a commission as major some weeks ago, but has now yielded to a second request. He has to relinquish important duties in connection with the construction of the subways in New York City. Mr. Hodge, senior member of the firm of Boller, Hodge & Baird, has been a member of the Public Service Commission since January, 1916. He entered the firm of Boller, Hodge & Baird in 1895. This firm has designed many important bridges and other structures, including cantilevers at Pittsburgh, the Municipal bridge across the Mississippi river at St. Louis, three bridges across the Connecticut, for the state of Connecticut, and the Singer and Metropolitan buildings in New York City.

A Correction

In the article entitled "Railway Men Organized for Foreign Service," published in the special war number of the *Railway Age Gazette* on June 22, the former connection of C. M. Anderson, second lieutenant in the First Reserve Engineers, now stationed at New York, was incorrectly given as superintendent of safety of the Nashville, Chattanooga & St. Louis, Nashville, Tenn.

Pennsylvania Electric Locomotive

In the article describing the Pennsylvania's new electric locomotive, which was published in the *Railway Age Gazette* of June 8, on page 1199, the fact that the electrical equipment was supplied by the Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., was omitted through oversight. This company provided the motors and all electrical apparatus and equipment used on this locomotive.

Car Shortage Again Reduced

That the railroads are providing a much more nearly adequate transportation service for all classes of freight is indicated by the fact that the unfilled car orders, or what is called the "car shortage," show a reduction on June 30 of nearly 50 per cent from the situation on May 1, according to a statement by the Railroads' War Board. The unfilled car orders on May 1 were 148,627; on June 1 they were 106,649, and on June 30 they had been reduced to 77,144.

Reports just compiled by the War Board also show that the railroads, in their co-operative effort to realize the maximum of transportation efficiency, have already effected an extraordinary improvement in the amount of coal handled. As its first important official act, the board directed that railroads should give preference to the movement of coal. Reports to the Geological Survey, just available, show that in June the railroads of the country hauled 750,323 cars of bituminous coal—an increase of 26.2 per cent over June last year.

"In this emergency, when the railroads are making the utmost effort to give the maximum freight service," the statement says, "it is gratifying to the Railroads' War Board to be able to report the fine co-operation they are receiving from regulating bodies and shippers in all parts of the country. The effect of this co-operation and effort is to be seen in the foregoing statement of results."

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF MAY, 1917

Name of road.	Average mileage operated during period.	Operating revenues—			Operating expenses—			General.	Total.	Net from railway tax accruals.	Increase (or decrease) last year.
		Freight.	Passenger.	Total.	Traffic.	Trans- portation.	Miscellaneous.				
Alabama & Vicksburg.....	134	\$108,716	\$37,955	\$146,671	\$20,096	\$33,995	\$4,629	\$34,580	\$6,650	\$121,220	\$7,684
Arizona Eastern.....	378	383,100	159,879	542,979	30,096	33,255	27,881	57,976	28,380	116,356	15,985
Arizona Southern.....	378	1,008,781	159,879	1,168,660	139,879	159,879	33,800	273,578	144,680	228,898	231,331
Atchafalaya & Santa Fe.....	8,649	8,645,532	2,309,559	11,955,091	1,274,022	2,159,867	208,412	3,668,004	34,319	232,348	319,882
Atlanta & West Point.....	93	68,015	47,660	115,675	13,203	14,453	2,691	15,544	3,111	18,655	23,593
Atlanta, Birmingham & Atlantic.....	640	248,951	319,385	568,336	47,063	32,995	12,881	59,944	31	11,951	24,072
Atlantic Coast Line.....	4,772	2,524,247	742,801	3,267,048	328,881	697,681	67,169	1,366,160	12,340	82,588	6,464
Baltimore & Ohio.....	4,345	9,066,551	1,408,236	11,474,787	1,348,491	2,146,296	199,774	4,291,303	69,355	249,295	97,389
Baltimore & Ohio Chicago Terminal.....	79	466	180,597	25,389	34,453	956	103,961	1,703	173,891	240,689
Baltimore, Chesapeake & Atlantic.....	81	61,795	23,802	85,597	9,877	12,311	1,279	11,684	2,078	80,798	303,770
Baltimore & Annapolis.....	681	310,420	61,662	372,082	39,017	26,638	51,724	1,627	12,224	343,021	167,088
Bessemer & Lake Erie.....	205	1,029,618	26,352	1,055,970	109,135	275,980	12,691	352,826	17,938	788,765	240,689
Bingham & Garfield.....	36	292,244	4,309	296,553	26,797	27,971	945	28,916	3,419	308,843	167,088
Birmingham Southern.....	34	74,288	2,046	76,334	5,976	15,951	866	24,827	3,727	109,495	303,770
Birmingham & Nashville.....	225	3,244,442	1,587	4,832,629	52,762	33,568	7,740	60,508	114,292	3,917,459	1,008,293
Buffalo & Susquehanna R. R. Corporation.....	253	144,462	5,987	150,449	132,766	37,682	3,568	138,938	6,075	155,013	215,582
Butte, Helena & Great Falls.....	234	1,131,108	24,835	1,155,943	43,224	25,642	5,788	54,534	3,018	117,650	63,481
Canadian Pacific Lines in Maine.....	283	324,174	22,659	346,833	11,410	13,444	1,684	16,844	4,918	192,768	215,582
Carolina, Cincinnati & Ohio of S. C.....	191	18,605	270,316	198,921	18,605	270,316	3,404	417,195	12,687	297,474	100,369
Central of Georgia.....	1,919	7,652,007	270,489	7,922,496	1,271,474	181,530	227,334	39,404	42,630	906,542	64,238
Central of New Jersey.....	684	2,438,606	528,853	3,167,459	219,907	597,439	23,830	1,217,285	46,320	2,900,379	199,907
Central New York.....	343	151,633	3,181	154,814	10,449	19,855	4,929	24,774	3,892	123,247	19,667
Chesapeake & Ohio Lines.....	2,380	3,712,257	597,552	4,309,809	303,489	376,633	58,454	1,685,533	9,247	3,413,672	6,500
Chicago & Alton.....	1,033	1,260,802	347,767	1,608,569	172,019	174,887	329,593	39,841	33,587	1,224,429	33,282
Chicago & Eastern Illinois.....	1,131	1,372,293	258,750	1,631,043	245,166	402,017	26,601	674,393	38,589	1,224,429	55,400
Chicago & Erie.....	1,231	1,275,293	238,750	1,514,043	245,166	402,017	26,601	674,393	1,300,705	376,926	448,336
Chicago & Erie.....	1,231	1,275,293	238,750	1,514,043	245,166	402,017	26,601	674,393	3,727	1,300,705	448,336
Chicago & Erie.....	1,231	1,275,293	238,750	1,514,043	245,166	402,017	26,601	674,393	3,727	1,300,705	448,336
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Chicago & Erie.....	1,231	1,275,293	238,750	1,514,043	245,166	402,017	26,601	674,393	3,727	1,300,705	448,336
Chicago & Erie.....	1,231	1,275,293	238,750	1,514,043	245,166	402,017	26,601	674,393	3,727	1,300,705	448,336
Chicago & Erie.....	1,231	1,275,293	238,750	1,514,043	245,166	402,017	26,601	674,393	3,727	1,300,705	448,336
Chicago & Erie.....	1,231	1,275,293	238,750	1,514,043	245,166	402,017	26,601	674,393	3,727	1,300,705	448,336
Chicago & Erie.....	1,231	1,275,293	238,750	1,514,043	245,166	402,017	26,601	674,393	3,727	1,300,705	448,336
Chicago & Erie.....	1,231	1,275,293	238,750	1,514,043	245,166	402,017	26,601	674,393	3,727	1,300,705	448,336
Chicago & Erie.....	1,231	1,275,293	238,750	1,514,043	245,166	402,017	26,601	674,393	3,727	1,300,705	448,336
Chicago & Erie.....	1,231	1,275,293	238,750	1,514,043	245,166	402,017	26,601				

Name of road.	Average mileage operated during period.	Operating revenues.			Operating expenses.			Net railway operation.	Operating income (or loss).	Increase comp. with last year.
		Freight.	Passenger.	(Inc. misc.)	Traffic.	Trans- portation.	Miscel- laneous.			
Grand Rapids & Indiana.....	575	\$176,060	\$107,471	\$112,899	\$8,290	\$31,695	\$634	\$19,338	\$438,832	\$21,060
Grand trunk Western.....	817	6,211,962	1,190,440	1,408,551	97,010	2,612,695	17,735	51,200	2,830,720	859,467
Grand trunk & Michigan.....	817	6,211,962	1,190,440	1,408,551	97,010	2,612,695	17,735	51,200	2,830,720	859,467
Gulf & Ship Island.....	308	1,614,574	29,301	28,887	23,691	37,638	3763	7,184	113,207	10,048
Gulf, Colorado & Santa Fe.....	1,937	1,043,796	244,234	1,675,598	244,432	215,278	30,008	43,794	391,953	59,843
Gulf, Mobile & Northern.....	402	131,145	29,910	166,091	21,839	27,470	4,142	5,445	48,769	8,421
Hocking Valley.....	350	81,181	74,457	95,945	84,288	19,889	18,807	23,843	652,860	305,085
Houston & Texas Central.....	1,000	1,107,248	330,094	1,537,342	180,669	32,440	47,887	1,265	70,800	6,118
Illinois Central.....	4,766	5,167,594	1,237,053	7,379,628	983,408	1,485,063	106,545	1,600,333	5,086,714	2,293,213
Indiana Harbor Belt.....	109	.....	.....	476,841	61,182	64,250	2,607	10,306	350,130	8,921
International & Great Northern.....	1,159	872,519	208,456	1,142,126	124,339	163,550	24,221	29,935	711,421	126,711
Kansas & Michigan.....	177	279,981	3,689	320,271	39,956	29,988	4,489	7,014	116,100	10,471
Kansas City Southern.....	755	808,648	128,717	1,023,342	105,988	152,548	23,782	313,533	632,599	300,743
Lake Erie & Western.....	907	598,880	57,638	682,224	82,332	119,797	13,005	27,052	185,030	30,000
Lehigh & Hudson River.....	1,610	174,752	37,416	208,073	26,327	26,320	1,610	3,986	141,504	66,569
Lehigh & New England.....	296	416,985	14,288	339,979	39,480	47,117	3,941	9,503	197,263	13,676
Long Island.....	1,497	4,196,987	281,815	4,555,795	458,617	858,627	103,941	1,128,232	3,966,538	1,627,060
Long Island & Salt Lake.....	1,151	901,197	298,619	1,183,065	121,044	150,140	32,561	32,239	664,480	517,955
Louisiana & Arkansas.....	302	90,531	18,849	111,217	12,784	19,438	4,553	4,446	86,221	26,496
Louisiana Ry. & Navigation Co.....	208	133,060	27,236	28,000	26,218	6,207	62,219	6,386	137,425	35,043
Louisiana Western.....	208	189,421	8,228	28,781	21,709	33,487	7,874	7,481	33,227	19,819
Louisville & Nashville.....	5,670	4,410,539	1,211,114	6,410,539	781,574	1,369,125	129,337	1,311,77	4,817,407	2,059,129
Louisville, Henderson & St. Louis.....	1,201	854,765	90,106	944,871	141,546	13,377	54,881	7,433	180,923	42,918
Michigan Central.....	1,862	3,079,037	944,555	4,523,335	503,344	646,839	69,289	185,936	3,223,846	1,298,948
Midland Valley.....	3,103	169,963	47,367	228,833	55,146	30,043	3,103	85,208	49,923	5,138
Mineral Range.....	120	93,572	3,624	98,624	26,237	20,730	389	49,449	97,984	640
Minneapolis & St. Louis.....	1,647	708,327	139,092	906,220	147,495	99,387	18,200	381,924	609,126	100,641
Missouri & North Arkansas.....	4,365	2,661,917	334,464	3,115,435	325,680	44,379	17,355	4,878	2,611,793	118,585
Missouri, Kansas & Texas System.....	3,865	2,464,707	781,200	3,486,403	538,238	737,189	64,611	1,181,182	2,313,000	845,030
Missouri, Oklahoma & Gulf.....	332	125,579	22,140	155,795	21,736	3,906	70,272	7,200	136,686	29,113
Missouri Pacific.....	3,756	2,240,499	433,843	2,889,908	452,133	469,339	79,985	1,060,653	8,340	64,608
Mobile & Ohio.....	1,160	1,723,615	120,534	1,717,352	117,995	28,548	33,967	390,850	2,363	32,378
Monongahela Connecting.....	6	17,132	1,183	16,607	2,859	24,589	1,393	7,785	12,911	3,511
Morgan's L. & T. R. & S. Co.....	407	907,764	133,438	49,650	83,017	12,633	146,979	2,208	13,173	30,049
Nashville, Chattanooga & St. Louis.....	1,297	1,272,286	130,843	246,532	64,130	41,579	11,156	35,807	909,370	362,916
Nevada Northern.....	265	20,663	2,143	22,748	2,705	2,376	817	4,492	92,138	320,429
New Orleans Great Northern.....	185	18,129	2,113	14,014	1,448	2,140	407	3,680	86,433	6,144
New Orleans & Texas.....	1,135	1,254,132	4,381,433	20,437,826	2,092,892	3,667,264	228,317	7,888,330	269,517	29,989
New York Central & Mexico.....	673	1,389,315	1,281,335	1,449,519	115,337	1,967,951	40,502	802,164	5,353	34,783
New York, Chicago & St. Louis.....	5,081	3,685,201	2,686,062	7,333,618	785,979	883,780	53,669	2,960,929	108,253	195,185
New York, New Haven & Hartford.....	1,998	511,291	104,021	756,263	93,870	124,000	9,678	290,616	184,416	25,000
New York, Ontario & Western.....	567	1,254,132	1,281,335	1,449,519	115,337	1,967,951	40,502	802,164	5,353	34,783
New York, Philadelphia & Norfolk.....	115	3,311,500	4,307,700	10,387,111	1,409,200	1,409,200	1,409,200	1,409,200	1,409,200	1,409,200
New York, Philadelphia & Western.....	20,85	4,852,061	486,203	5,338,263	539,263	1,081,157	64,444	1,807,386	11,800	107,721
Norfolk & Western.....	908	317,768	91,828	436,576	53,394	71,007	9,648	1,566,340	101	20,764
Norfolk Southern.....	6,513	5,999,449	1,195,364	7,772,123	1,335,574	739,134	110,328	2,535,151	104,000	44,646
Northwestern Pacific.....	5,907	184,538	165,863	397,402	54,209	40,095	7,326	630,966	1,044	1,254,536
Oregon Short Line.....	2,307	2,188,803	446,274	2,826,716	31,212	280,350	40,082	639,583	43,223	15,778
Pacific Northwest.....	2,070	1,628,628	487,766	2,216,394	286,255	35,325	44,436	1,727,541	1,970	1,727,541
Pennsylvania R. R. & N. Y. Co.....	1,755	5,298,128	1,051,576	7,035,059	795,595	1,275,305	93,007	2,950,622	47,621	158,846
Pennsylvania Company.....	4,516	16,070,885	4,027,857	22,222,999	2,600,841	4,568,857	225,452	8,199,356	330,724	164,550
Pennsylvania Railroad.....	19	13,687	5,675	97,924	13,171	14,160	39	59,901	3,144	50,451
Pere Marquette.....	2,250	1,562,327	1,038,038	2,086,308	250,866	70,517	41,714	794,238	4,852	48,438
Pittsburgh & Lake Erie.....	225	1,709,040	181,837	2,793,933	353,466	574,246	13,865	3,462	36,057	1,757,713
Pittsburgh & West Va.....	111	1,108,83	131,809	1,311,809	19,487	17,880	1,575	44,006	3,656	93,174
Pittsburgh, Cincinnati, Chic. & St. L.....	2,399	4,433,444	1,103,667	6,302,110	659,568	1,273,513	10,316	2,488,392	40,601	150,178
Pittsburgh, Shawmut & Portmac.....	488	251,062	51,08	92,822	18,080	52,034	1,424	45,974	6,001	124,112
Richmond, Fredericksburg & Potomac.....	28	23,907	428,871	36,331	4,194	132,003	3,087	20,013	197,450	15,387
St. Louis & Great Ind......	238	201,406	23,907	238,903	15,533	3,004	72,392	61,033	7,856	18,940
St. Louis, Brownsville & Mexico.....	548	181,981	29,652	47,891	40,818	90,105	1,033	10,796	196,633	8,800

Meeting of Telegraph Superintendents Postponed

On account of the present international situation the executive committee of the Association of Railway Telegraph Superintendents has postponed indefinitely the annual meeting, which was to have been held at Washington, D. C., on September 18. The committee has also decided to call a special meeting of the association in Chicago for a short session of one or two days during the month of November. This meeting will be strictly a business session free from entertainment. All committees will be expected to continue their work as far as possible, and be prepared to present reports for discussion and action at the proposed meeting in Chicago.

One Hundred Chief Clerks

The chief clerks of departments in the Baltimore and Ohio general offices at Baltimore, Md., have formed an association for closer business and social relations, and will gather at luncheons once a week, on Wednesdays. There are in this building more than 100 chiefs of clerical forces, including representatives of the executive offices and subdivisions of the various departments.

The committee in charge of the organization consists of T. Carroll Roberts, president's office, chairman; C. E. Hanson, controller's office; C. G. Martin, general manager's office; E. W. Murray, freight traffic department; John Peach, motive power department; and E. R. Sparks, chief engineer's office.

Officers of the company will be invited to address the members concerning different phases of railroad operation. No dues will be charged, the intention being to make the gatherings informal. The association is designed to serve as a clearing house through which the chief clerks will be able to work out plans of office organization, employment of assistants and other matters relating to their work.

New York City Subways

The New York State Public Service Commission, First district, expects within 10 days to have the New York Consolidated Railroad Company operating subway trains in Broadway, Manhattan. Local trains will begin running between Canal street on the south and Fourteenth street on the north. The New York Consolidated Railroad Company is the operating company of the New York Municipal Railway Corporation, which operates the Fourth Avenue subway in Brooklyn and the Brooklyn elevated lines. At first operation will be by trains coming from the Fourth Avenue (Brooklyn) subway over the Manhattan bridge, and thence running through the new Canal Street subway to Broadway, and thence north to Fourteenth street. In the fall it is expected that the service will be extended northward to Thirty-fourth street and to Forty-second street; and before the close of the year it may be extended southward from Canal street in Broadway to the City Hall or further south. It will be more than a year before this Broadway subway will be finished to its northern and southern termini, both of which will be in Brooklyn.

Grade Crossing Signs in Connecticut

By a law, No. 373, which has been adopted in Connecticut, all cities, towns and boroughs in that state are required to maintain cautionary signs approaching railroad grade crossings—at a distance of 300 ft. to 500 ft.—the signs, however, to be furnished by the railroad company. Connecticut thus follows the lead of New Hampshire, and the design of sign prescribed is the standard which has been approved by the American Railway Association and by the National Association of Railroad Commissioners. By the same law the Public Utilities Commission is directed to investigate, and where deemed advisable is empowered to designate certain crossings as "stop" crossings, where self-propelled vehicles must be brought to a stop before passing over the tracks; and at such crossings the commission may require the railroad company to erect and maintain signs within the limits of its right of way. The cautionary sign is to bear the letters "RR," and the stop sign is to be lettered STOP. The commission may require the stop sign to be lighted at night or to be accompanied by a red light. The commission, on petition of a municipality, may make reasonable exceptions to the law. The municipality which neglects to comply with the law,

unless released by the commission, is to forfeit one dollar for each day of neglect. Any person damaging a sign or extinguishing a light will be liable to a fine of \$10, or to imprisonment for 30 days, or both.

Labor from Porto Rico

At a recent conference between representatives of the Department of Labor and of the railroads, the fact was developed that there are in Porto Rico a number of men, estimated at 50,000, lacking regular work who could be brought to this country and used for railroad and agricultural purposes, provided ocean transportation could be secured and proper conditions of work could be assured. The Railroads' War Board has issued a circular to the railroads calling attention to this fact, for the purpose of ascertaining whether any railroads desire to avail themselves of this plan of obtaining labor in order that, upon the total number being ascertained, a concrete proposition may be made by the Department of Labor to the other departments interested, to provide the necessary ocean transportation. The representatives of the Department of Labor have named informally the following conditions:

The railroad companies should make their requisitions for labor through the Department of Labor, stating how many workers are needed and where, how long the work will last, and the wages, hours and living conditions. The companies should furnish free transportation for the workers from the point of entry to the place of work, feeding them en route. If engaged to work six months or more and the workers fill their part of the contract, if they then desire to return to Porto Rico they should be given free transportation to the nearest port to Porto Rico; that the workers, or so many of them as so desire, be allowed to work for the farmers along the lines of the companies hiring them in the cultivating and harvesting of the crops; after such harvesting they be allowed to return to work for the railroads; that the workers will not be used in any sense as strike breakers during industrial disputes between employers and employees.

Pooling Cars at Freight Houses

One of the plans introduced by the Chicago committee of the Commission on Car Service, which was recently organized, is a scheme whereby roads in the Chicago switching district can utilize each other's empty cars for loading at freight houses, with the understanding that they will return a like number of empty cars the following week. This method of car equalization saves unnecessary switching and obviates the necessity of refusing freight on account of a lack of available cars. The car balance sheet for the period extending from July 1 to July 7, inclusive, shows that 1,127 empty box cars were exchanged between local freight houses in Chicago territory by 13 of 25 roads operating in that territory. Complete reports from all of the roads are expected to be received as soon as the work of the committee becomes more completely organized. D. I. Forsythe, formerly general car accountant of the Wabash, is vice-chairman in charge of detail work of the Chicago committee, and H. E. Byram, vice-president of the Burlington, is chairman.

The St. Louis committee of the Commission on Car Service intends to inaugurate a similar plan in the St. Louis switching district, and proposes later to extend the plan to cover industries as well as freight houses. A special committee has been appointed consisting of John Fitzgerald, superintendent of the Louisville & Nashville; Robert Rice, general superintendent of the Chicago, Burlington & Quincy, and M. B. Casey, superintendent of transportation of the Wabash, to formulate rules to be followed in the matter of equalizing the box car supply when the pool becomes effective.

The St. Louis committee of the Commission on Car Service is headed by John Cannon, acting general superintendent of transportation of the Missouri Pacific, and has as its other members, M. B. Casey, B. G. Fallis, general superintendent of the Southern; C. S. Millard, superintendent of the Cleveland, Cincinnati, Chicago & St. Louis; Wm. Atwill, superintendent of the Illinois Central; C. W. Woods, assistant to the vice-president of the Pennsylvania Lines, and W. Mosby, assistant to the vice-president of the St. Louis Southwestern.

Courtesy of the Pass Privilege

Elisha Lee, general manager of the Pennsylvania Railroad, has sent to each employee of the road a leaflet on this subject, which says: "In view of the reduction in passenger train service, required as a war measure to aid in the movement of troops, government supplies and freight, all employees riding on passes should be especially careful in observing their courteous obligation not to occupy seats when pay passengers are standing. An employee using a pass is enjoying a privilege of transportation. A passenger holding a ticket has bought and paid for a right of transportation, which must be regarded as in every way superior."

"Under war conditions, trains will at times unavoidably be crowded. It may not always be possible to give every passenger a seat, but certainly none should stand while railroad men, holding passes, are seated. The obligation of an employee in such a case is plain, and rests upon the principles of courtesy and right. It may be performed without embarrassment to anyone, and without attracting needless attention, by simply arising and moving quietly to another part of the car or train."

"The success of the railroads in coping with the great burdens which the war is laying upon them depends very largely upon their ability to retain the confidence and win the co-operation of the public. Every employee who shows courtesy and consideration helps toward this end; every one who fails in these respects hinders it."

"Here is a chance to help!"

Alaska Coal

The Eska Creek coal mine, located in the Matanuska coal fields, Alaska, was bought on June 18 by the Alaska Engineering Commission, and formally taken over from the private concern, which has been operating it for several months. The purpose of the commission in purchasing the mine is to secure an adequate supply of coal for the construction and operation of the government railroad. This object was attainable only through the operation of the mine on a larger scale, and by the installation of proper facilities. The commission will also take steps at once to open the mine in Chickaloon, and the necessary machinery will be installed as soon as the railroad reaches that point, probably in August. It is not the intention of the government to remain in the coal mining business permanently, but when the mines have been opened sufficiently to supply the large tonnage needed by the commission, it is proposed to lease them to private parties in accordance with the provisions of the coal leasing regulations.

A press despatch from Seward, Alaska, July 14, announces the discovery of a four-foot seam of coal, close to the government railroad, at Mile 175.

The Secretary of the Interior on July 14 asked Congress for an additional appropriation of \$4,000,000 for construction on the Alaska Government Railroad in order to close a gap in the main line and to hasten the opening of the Matanuska coal fields. This is in addition to a \$10,000,000 appropriation recently authorized by Congress.

Women on the New York Central

Women have made "a splendid start" on the New York Central, according to a statement made by an officer of the road. A gang of thirty women, under direction of a woman book-keeper, is employed at Collinwood, Ohio, in sorting 3,000 tons of scrap metal. They do the work as well as men, and appear to like it. The woman who does the same work as a man will get the same pay. Those women who are sorting scrap get an average of \$2.50 a day.

The number of women employed in the auditing department has been increased; and there are many in the car record office. Some are being trained in the purchasing department, to sell tickets, and to act as watchmen at railroad crossings. In the shops women are learning to run lathes, drills and other small tools, and women will be employed as assistants in stations. One woman has been in the service as watcher at a railroad crossing for the last ten years.

Vice-president A. T. Hardin says: "Our present work is centered largely in organization and training. The women we are

training are in many instances relatives of our employees. They have taken up railroad work eagerly and energetically. Their contribution to the industrial welfare of the country will be of tremendous benefit to women. Many women have extraordinary energy and power for constructive work, which has never been put to practical use. The war gives them an opportunity to serve their country and themselves. Sir Robert Borden, premier of Canada, was anti-suffrage until the war sent men to the front and put women at work in their places; and in a speech recently he said: 'Canada owes her salvation to her women.'

"The New York Central has about 85,000 employees, but many of them through the nature of their work are exempt from the draft. Many railroad men have volunteered, however. Two hundred of our finest mechanics have volunteered in engineering regiments, which will work on the railways of France. . . ."

Rules for Conservation of Food on Dining Cars

The Railroads' War Board has adopted resolutions pledging the committee and its individual members to put into effect rules for the conservation of food on dining cars, as worked out between Herbert Hoover, United States food administrator, and representatives of the commissary departments of the railroads. The regulations were the result of a suggestion made by President E. V. Baugh of the Railway Dining Car Superintendents' Association and were presented by Mr. Hoover to the members of the railroads' Special Committee on National Defense at a recent meeting in Washington. The food administration rules suggested for dining cars are as follows:

"Your cordial and thoughtful co-operation is earnestly requested in helping to win the war by conserving our food. Each one has a part to play. If we cannot fight we can avoid waste and eat wisely and in accord with our country's needs. All food served on the table and not eaten is wasted."

"1. All wheat bread and butter portions are to consist of not more than two medium sized slices of bread or toast and one pad of butter, and a charge should be made for them. A charge should also be made for all crackers or biscuits. Charge for each extra pad of butter."

"2. Serve no wheat bread, crackers or wheat cakes for lunch or breakfast. Use instead corn bread (baked thin), corn muffins, corn cakes, fried mush, rye bread, oatmeal, oat cakes, buckwheat cakes, rice cakes. Serve honey and syrups with cereal stuffs whenever possible as substitutes for cream and sugar."

"3. Make tarts instead of pie, leaving off bottom or top crust."

"4. AVOID ENTIRELY use of wheat bread, toasted, to be served under chops, squabs, chickens, entrees, game, etc."

"5. Serve beef, mutton or pork not more than once per day. REDUCE SIZE OF ALL MEAT PORTIONS BY ONE-HALF, making same charge for second portion. The average meat portion should not exceed five ounces served. Increase fish and sea food courses and make specialties of them."

"Make special dishes of hashes, cooked-over meats, croquettes, etc., to avoid waste."

"6. Serve chickens, eggs, pigeons, squabs, rabbit, fish."

"7. Serve NO VEAL, lamb, squab-chickens or squab-turkeys."

"8. Serve cottage cheese."

"9. USE NO BUTTER IN COOKING. Fry foods in animal fats or vegetable oils. Serve cream in individual portions with special charge."

"10. Serve liberal portions of all vegetables and fruits in season. Encourage use of potatoes. Make a specialty of baked beans and brown bread."

"11. Avoid waste by serving smaller portions, particularly of bread, butter, meats, milk, cream, sweets."

The rules had previously been submitted to the advisory committee on alimentation and the experts in utilization and conservation associated with the work of the food administration. The war board in its resolutions also expressed hearty approval of the work in which Mr. Hoover is engaged and extended its thanks for his appearance before the committee. Details of the plan to put the rules into effect were to be worked out by a special committee of the Dining Car Superintendents' Association.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

AMERICAN ASSOCIATION OF DINING CAR SUPERINTENDENTS.—H. C. Boardman, D. L. & W., Hoboken, N. J. Next convention, to have been held October 22-24, 1917, San Francisco, Cal., indefinitely postponed.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Next meeting, October 16-17, St. Louis.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichy, C. & N. W., Chicago. Next convention, October 16-18, 1917, St. Paul, Minn.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—W. L. Connelly, Sup't. of Telegraph, Indiana Harbor Belt, Gibson, Ind. Next annual meeting to have been held September 18, 1917, Washington, D. C., indefinitely postponed.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 1st Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal, Que.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

CENTRAL RAILWAY CLUB.—D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March. Hotel Statler, Buffalo, N. Y.

CHIEF INTERCHANGE CAR INSPECTORS AND CAR FOREMEN'S ASSOCIATION.—W. K. Allen, New York Central, Albany, N. Y. Next convention, September, 1917, St. Louis.

CINCINNATI RAILWAY CLUB.—H. Bouthet, Chief Interchange Inspector, Cin't Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, July and November. Hotel St. Clair, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 568 Union Arcade Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

INVESTMENT BANKERS' ASSOCIATION OF AMERICA.—Frederick R. Fenton, 11 W. Monroe St., Chicago. Annual convention, October 1-3, 1917, Baltimore, Md.

MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—J. H. Jager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 16-18, 1917, Cleveland, Ohio.

NATIONAL ASSOCIATION OF RAILWAY COMMISSIONERS.—Jas. B. Walker, 120 Broadway, New York City. Next annual convention, October 16, 1917, Washington, D. C.

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

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 2d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Geo. A. J. Hochstetere, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Tribune Bldg., Buffalo, N. Y.

PACIFIC RAILWAY CLUB.—W. S. Wollner, Assistant to Chief Engineer, Northwestern Pacific R. R., San Francisco, Cal.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

RAILWAY CLUB OF PITTSBURGH.—H. B. Rogers, 307 P. Atlanta Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial-Annex Hotel, Pittsburgh.

RAILWAY FIRE PROTECTION ASSOCIATION.—C. R. Edwards, office of the president's assistant, Seahound Air Line, Norfolk, Va. Next meeting, October 2-4, 1917, St. Louis, Mo.

RAILWAY REAL ESTATE ASSOCIATION.—R. H. Morrison, Assistant Engineer, C. & O., Richmond, Va. Next convention, October, 1917, Duluth, Minn.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next annual convention, September, 1917, Atlantic City, N. J.

RICHMOND RAILROAD CLUB.—F. O. Robinson, 307 P. Atlanta Sta., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September 18-21, 1917, Hotel Auditorium, Chicago.

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

SIGNAL APPLICATION ASSOCIATION.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September and November, 10 N. W. Cor. 1917, Atlanta, Va.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Gen'l Ag't, Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings bi-monthly, Pittsburgh.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio. Next convention, September, 1917, Chicago.

UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

WESTERN CANAL CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

Traffic News

Railroads in Colorado, Florida and Utah have withdrawn their applications for authority to make a 15 per cent increase in intra-state freight rates.

The Mobile & Ohio has taken off its dining cars, and the schedules of through trains are now so arranged that passengers can eat at stations.

Southern Pacific agents, who are now engaged in a carloading contest, are appealing to shippers and consignees to utilize Sundays and holidays in order to release freight cars on their sidings. It is pointed out that a genuine emergency exists, and that emergency measures should be taken.

Shipments of anthracite coal for the month of June established a new record not only for that month, but totaled a figure which is the greatest in the history of the industry. The statement of the Anthracite bureau says that shipments amounted to 7,049,037 tons, an increase over the preceding month of 131,512 tons.

The Lehigh Valley reports that in the six months ending June 30 it carried a total of 4,297,925 tons of the larger or domestic sizes of coal; and the total carried by the road in June, all sizes (1,347,205 tons), was about 35 per cent more than in June the preceding year.

A. G. Thomason, demurrage commissioner for New England, reports that the average detention of freight cars by consignees in that territory in the month of May was 1.60 days per car, as compared with 1.99 days per car in May of last year. The number of cars reported was about the same in both years, a little over 300,000. Mr. Thomason calculates this saving in time as equivalent to an addition of 3,872 cars to the available stock of cars in New England for the month.

The Council of National Defense recommends that the Federal Shipping Board build barges and tow boats, for use on navigable inland waters, the boats to be sold to private parties. The Committee on Inland Water Transportation reports that canal and river boats are scarce; and the present recommendation is made as indicating the only means of carrying out the government's idea of using inland waterways for the purpose of transporting freight to relieve the overburdened railways.

The American Express Company now has a full-fledged "Travel department," and its manager is Ralph E. Towle, 65 Broadway, New York City. A monthly bulletin is to be issued. Ticket counters in charge of experienced tour men are now maintained at the company's city offices in New York, Boston, Albany, Philadelphia, Cleveland, Detroit, St. Louis, Chicago, San Francisco and Los Angeles. At these offices facilities have been provided for ticketing passengers to all parts of the world. Information and tickets from these ticket offices can be quickly secured by other American express offices in the vicinity. Hotel and sightseeing coupons are furnished, and personally conducted tours are offered.

The Southern Railway, as an effective means of releasing a larger proportion of the food and feed stuffs grown in the South for the use of the armies and navies of the United States and her allies, is co-operating with the United States Agricultural Department, and local business men, to promote planting by individual farmers of a "fall food acre." Seed dealers will put up assorted packages of seeds of standard food and feed crops, which can be planted in July, August and September, and which will furnish food and feed for the farmer's family and his livestock in the fall and winter months. These packages will be sold at cost to farmers. But limited supplies of seed are available, and probably it will be impossible fully to supply the demand for these packages.

The final statement concerning the curtailment of passenger service in the Boston & Maine shows that 253 week-day trains were taken off, out of a total of 1,050. These changes, however, affect mainly what may be called all-the-year-round time-tables:

and it appears that a sufficient number of summer trains have now been put on so that the number of passenger train men in the service is more than it was a month ago. Speaking of the reasons for taking off through trains, an officer of the road says that a single passenger train from Troy, N. Y., to Boston, 190 miles, in the week ending May 20, caused the side-tracking of 39 freight trains for a total period of 45 hours and 45 minutes. Assuming that this means the record for six days, the average daily delay was 6 hr. 37 min.

The Nashville Chattanooga & St. Louis has just completed a series of records of the movement of pineapples from Cuba via the Florida East Coast car ferry through Key West, Fla. Seventy-four special trainloads were moved from Atlanta, Ga., to Martin, Tenn. (a junction with the Illinois Central), a distance of 431 miles, in an average running time of 22 hours, 54 minutes. Excluding the necessary delays for changing engines, the average running time was 25 miles an hour. The average time of 22 hours 54 minutes included the movement of one train, which, because of a break in the line, interrupting traffic, took 37 hours and 33 minutes for the trip. The route from Key West to Chicago was over the Florida East Coast, the Atlantic Coast Line, the Central of Georgia, the Nashville, Chattanooga & St. Louis, and the Illinois Central.

M. L. Cooke, chairman of the storage facilities sub-committee of the General Munitions Board, believes that unless the country learns to load, route and handle its freight cars more efficiently, America soon will be in as bad a situation as some of the European nations. "In England," says Mr. Cooke, "many classes of non-military shipments can get the use of the railways only one day in seven. We are going to appeal to manufacturers to help by assembling and shipping stores so as to require the minimum of handling and haulage." In the handling and storage of supplies for the army, Mr. Cooke proposes to establish points of local assemblage at which goods in less than carload lots can be temporarily stored, and full carloads made up for shipment. In the accumulation of such stores motor trucks will be extensively used. In England, he says, any haul under forty miles is considered a motor-truck haul; and it is hinted that a similar rule will be adopted here.

A car conservation luncheon was held on the roof garden of the Hotel La Salle, Chicago, on July 17. The relation of the car supply to the war and means of increasing the available supply of equipment through increased efficiency on the part of both railroads and shippers were the subjects discussed. The speakers included F. B. Montgomery, manager of the traffic department of the International Harvester Company, Chicago; Samuel O. Dunn, editor of the *Railway Age Gazette*, Chicago; W. L. Park, vice-president of the Illinois Central, Chicago; H. C. Barlow, traffic director of the Chicago Association of Commerce, and advisor to the division of car service of the Interstate Commerce Commission; J. F. Porterfield, general superintendent of transportation of the Illinois Central; W. S. Bode, vice-president of Reid, Murdock & Co., Chicago, and D. I. Forsythe, vice-chairman of the Chicago committee of the commission on car service. The luncheon was held under the auspices of the National Industrial Traffic League, the Traffic Club of Chicago, the Chicago Association of Commerce, the Illinois Manufacturers' Association, the Central Manufacturing District of Chicago, and the Chicago committee of the commission on car service of the American Railway Association.

Curtailment of Passenger Service

The Pennsylvania Lines West of Pittsburgh withdrew 34 passenger trains from service on July 1, including 10 Pittsburgh suburban trains. Most of the trains withdrawn were on local runs. The extent of the reductions made approximate 1,200,000 train-miles per annum. The Cleveland, Cincinnati, Chicago & St. Louis on the same date reduced its passenger train mileage to the extent of 2,240 passenger train-miles a day. Among the trains removed were one in each direction between Cincinnati and Chicago; one train between Cleveland and Indianapolis; one between St. Louis and Indianapolis; one train in each direction between Cleveland and Galion; one local train in each direction between Indianapolis and Mattoon; one local train in each direction between Indianapolis and Champaign, and one in each direction between Urbana and Peoria. Observation parlor car

service on one train in each direction between Cincinnati and Chicago has been discontinued. The Michigan Central recently withdrew two trains between Detroit and Ypsilanti; one between Chicago and Detroit, and two between Detroit and Mackinaw. The New York, Chicago & St. Louis has discontinued the running of special excursion trains. The Erie on June 10 removed 47 passenger trains from service. Altogether it effected a general reduction over the system of 3,400 passenger train-miles a day, exclusive of the New York commuting territory, where about 40 trains were taken off on May 6. The Chesapeake & Ohio has discontinued the operation of two trains between Chicago and Cincinnati, and now runs a sleeper between Chicago and Richmond via the Cleveland, Cincinnati, Chicago & St. Louis between Cincinnati and Chicago.

State Coal and Coke Hearings

A hearing on the application of the railroads for an advance of 15 cents a ton in coal and coke rates was held at Chicago by the State Public Utilities Commission of Illinois on July 18. A similar hearing was held before the Public Service Commission of Indiana at Indianapolis on July 16 and 17. The statements of William J. Jackson, receiver of the Chicago & Eastern Illinois, presented before both commissions, is in part as follows:

The war conditions will necessarily further advance the cost of materials, including fuel, labor and taxes, and bring about a scarcity of labor. Operating expenses will necessarily be increased by special service required. The carriers have already created a Special Committee on National Defense, giving it power to subordinate railway traffic and facilities of all roads to meet the present emergency. It will also make it necessary to have the most efficient operating machine possible. Each road must furnish a maximum of power, equipment and transportation effectiveness.

If all the increases in wages to employees that have been granted from January 1, 1917, to May 31, 1917, had been in effect during 1916, it would have resulted in an increased payroll, due solely to increases in rates of wages, on the C. & E. I., to the amount of \$820,000. This amount equals 10.66 per cent of the total payroll of the C. & E. I. for the year ending December 31, 1916. Many of these increases were necessary on account of the increased cost of living and in order to retain employees attracted by higher wages offered by industrial establishments. Had the Adamson law been in effect during the entire year 1916 it alone would have resulted in an increase in wages of \$336,400.

The average price of coal consumed by the C. & E. I. during the year ending December 31, 1916, was \$12.473, whereas the average price of contract coal purchased during the last two weeks of April, 1917, was \$18.291 per ton, or an increase over the year 1916 of 58.18 cents a ton. If the C. & E. I. had been compelled to pay the latter price for coal during the year ending December 31, 1916, its expenditures would have been increased by \$526,500.

The increases in the prices of various materials and supplies, including rails and ties, have been from 20 to 185 per cent. Based upon a study of the present market conditions, the purchasing department estimates that if the prices which shall prevail during 1917 for material and supplies, exclusive of ties, rails and fuel, had been in effect during 1916, it would have resulted in an increased cost of 51.6 per cent. This would have amounted to an increased expenditure of \$1,053,400, to which should be added \$22,400 to cover the increase in the cost of ties.

Rates for the transportation of coal from mines in Illinois and Indiana have been on a lower level than rates on coal in any other section of the country, and coal carrying lines operating in these fields never have been prosperous. The increases in coal rates in this territory have not kept pace with the increased cost of transportation, and the coal-carrying lines have found themselves operating on a very small margin of revenue over actual cost of operation. During the year ended December 31, 1916, the Chicago & Eastern Illinois transported 8,067,903 tons of bituminous coal and 7,725,139 tons of other freight, coal representing 51.09 per cent of the total tonnage. For transporting this coal it received \$4,236,026, or 33.79 per cent of its total freight revenue, while for transporting other freight it received \$8,300,698, or 66.21 per cent of the total freight revenue. This emphasizes the need of those carriers whose tonnage is principally coal for additional revenue.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

Campbell's Creek Railroad

Campbell's Creek Railroad v. Ann Arbor et al. Opinion by Commissioner Meyer:

The Campbell's Creek Railroad Company is entitled to receive a division on coal delivered to the Kanawha & Michigan Railway, figured upon the basis of a mileage prorate of 28 miles, 200 per cent of the actual mileage of its line. (44 I. C. C., 574.)

Coal to Southern California

Independent Ice, Feed & Fuel Company et al. v. San Pedro, Los Angeles & Salt Lake et al. Opinion by Commissioner Harlan:

The present rate of \$5.65 per net ton on coal in carloads from the Castle Gate rate group of Utah and the Rock Springs district of Wyoming to points in southern California, including Los Angeles, has not been shown to be unreasonable.

On lump coal in carloads from mines in New Mexico to points in southern California, including Los Angeles, a rate of \$5.15 per net ton is found to be a reasonable maximum rate for the future. Reparation denied. (44 I. C. C., 666.)

COURT NEWS

Jurisdiction of Action to Recover Overpayments

The Massachusetts Supreme Judicial Court holds that a state court has no jurisdiction of an action to recover back overpayments of demurrage charges claimed to have been collected unlawfully. The construction of the tariffs was involved, and had not been passed upon by the Interstate Commerce Commission.—*Cheney v. Boston & Maine (Mass.)*, 116 N. E., 411. Decided June 1, 1917.

Crossing Accident—Contributory Negligence

In an action for injuries at a crossing the New York Appellate Division holds that defendant railroad's negligence is not a jury question, where 29 of 31 witnesses testified to hearing its engine whistle on approaching a crossing, since it was not bound to anticipate either that plaintiff, a motorcycle rider, was deaf or that his machine prevented his hearing the signals. Plaintiff was guilty of contributory negligence as a matter of law, where he passed buildings obstructing his view at such speed that he could not stop his machine between the point where he first saw the approaching train and defendant railroad's tracks.—*Bowden v. Lehigh Valley*, 165 N. Y. Supp., 454. Decided May 9, 1917.

Trespassing Children

Action was brought in New York for the death of a boy seven years old, run over by a train while sitting on the track. The boy's father rented a house from the railroad company, and the premises abutted on the railroad. The train was running about 40 miles an hour, and the engineman did not see the child until he was within 30 feet of him. The track was unfenced. The United States Circuit Court of Appeals, Second Circuit, held that the railroad was not required to fence against human beings. The New York statute only applies to animals. The child was a trespasser, and the court held that the road was bound only to exercise ordinary care to avoid injuring the child after discovering its peril. There was no reason to expect that persons would be on the track at this place. The evidence conflicted as to whether the engineman blew his whistle when he discovered the child, but it was held that if, in applying the brake, he failed to blow his whistle, his omission under the circumstances would not constitute such negligence as to render the railroad liable. Judgment for the defendant was affirmed.—*McCarthy v. New Haven*, 240 Fed., 602. Decided February 6, 1917.

Frightening Horses by Whistle

In an action for personal injury from the frightening of horses by an unnecessarily loud blast of a locomotive whistle, blown to signal to persons in the rear of the train that it was about to start and to warn pedestrians at a grade crossing, there was no showing that the engineer had seen the horses, or that they were frightened when the whistle was blown. The Pennsylvania Supreme Court held that judgment was properly entered for the defendant, notwithstanding verdict for the plaintiff. The blowing of a whistle by a locomotive engineer is a lawful act, and when negligence is alleged, in that it was very loud, the plaintiff must prove that the act, either as to the time, place or manner, was unlawful.—*Weaver v. Pennsylvania (Pa.)*, 100 Atl., 989. Decided February 26, 1917.

Exclusive Transfer and Express Privileges

The Oregon Supreme Court holds that the state statute prohibiting railroads from giving "undue or unreasonable preference" to any person does not prohibit them from granting exclusive privileges to transfer companies, the legislative intent being merely to prohibit the showing of preference to passengers or shippers. The court followed the Express Cases, 117 U. S. 1, where it was first ruled that railroad companies were not required by usage or the principles of the common law to transport the goods of independent express companies over their lines in the manner in which such commerce was usually carried, nor were they, in the absence of a statute commanding it, required to furnish to all independent express companies facilities for doing an express business on their passenger trains. The Oregon court applied the principle to a contract for the exclusive privilege to solicit passengers on incoming trains at Portland for the transfer of their baggage to points in the city, which it upheld. It also held that an ordinance of the city of Portland prohibiting railroad companies from granting exclusive privileges to transfer companies is invalid as being unauthorized by the city's charter.—*Baggage, etc., T. Co. v. Portland (Ore.)*, 164 Pac., 570. Decided April 17, 1917.

Right to Haul Defective Cars

The Circuit Court of Appeals for the Sixth Circuit, in a suit against the Baltimore & Ohio Southwestern, has sustained the District Court for the southern district of Ohio, western division, in declaring it unlawful for the road to move on its line, for repairs, a defective car received from a connecting carrier in a defective condition. The decision, by Judge Sanford, says:

A defective car cannot be hauled for repairs without liability for the statutory penalty, except by the carrier upon whose line it became defective while being used. The clause "and such equipment shall have become defective or insecure while such car was being used by such carrier upon its line of railroad," thus limits the right.

It becomes necessary for a carrier to which a car . . . has been delivered to inspect it at the interchange point before accepting it, and if found to be defective to refuse to accept it.

Nothing in the safety-appliance acts or in any rule of the common law requires a carrier to accept from a connecting line a car equipped in violation of the safety-appliance act.

The privilege of hauling a defective car for repairs under the specific language of the proviso in section 4 of the act of April 14, 1910, is only granted when the car had, in the first instance, been properly equipped and thereafter became defective while being used.

The proviso in question relates in terms only to the movement of a car for repair after it has been discovered to be defective and does not relieve the carrier from liability for hauling a defective car before the defect has been discovered.

But, in case a defective car is received from a connecting carrier in a string or train of cars, the mere incidental handling of such car by the receiving carrier, refusing to accept it, in such manner as may be necessary to disconnect it from the other cars for redelivery to the connecting carrier and to proceed with the use of the other cars, would not be a use which would incur the penalties of the act; such incidental handling of the car not being in contravention of the purposes of the act, but a necessary step in furtherance thereof.

Equipment and Supplies

LOCOMOTIVES

THE NORFOLK & WESTERN is building 10 large 2-8-8-2 type Mallet locomotives in its own shops.

THE BRITISH WAR OFFICE, which ordered 50 Consolidation and 75 Prairie locomotives from the Baldwin Locomotive Works, has just given that company an additional order for 100 more Consolidation locomotives, at a price, it is said, of \$45,000 each.

THE UNITED STATES GOVERNMENT has placed orders for 300 80-ton Consolidation locomotives for service in France, 150 with the American Locomotive Company and 150 with the Baldwin Locomotive Works. Negotiations were originally for 300 locomotives from each of the builders, but only 150 from each were ordered at this time.

RUSSIAN GOVERNMENT.—The Russian government contracts for 500 Decapod locomotives divided equally between the American Locomotive Company and the Baldwin Locomotive Works, which were held up because of the financing, have now been definitely signed. These orders were first reported in the *Railway Age Gazette* in the issue of June 1. Reports have it that these locomotives will cost \$56,000 each.

FREIGHT CARS

THE DELAWARE & HUDSON is reported as inquiring for 50 steel underframes.

THE CANADIAN GOVERNMENT RAILWAYS have ordered 1,000 box cars from the National Steel Car Company.

THE SHELL COMPANY, Los Angeles, has ordered 50 tank cars from the General American Tank Corporation.

THE ERIE has given an order to the American Car & Foundry Company to repair 250 gondola and 250 box cars.

THE TEMISKAMING & NORTHERN ONTARIO has recently ordered 100 40-ton steel frame box cars from the Canadian Car & Foundry Company.

THE SOUTH BUFFALO RAILWAY has ordered 300 steel hopper cars for the Lackawanna Steel Company from the American Car & Foundry Company.

THE PENNSYLVANIA RAILROAD has placed orders with its Altoona shops for the construction of 2,225 freight cars as replacements, for 1918 delivery, as follows:

- 2,000 all-steel box cars
- 100 steel maintenance of way flat cars
- 100 steel cabin cars
- 25 steel "well-hole" cars

The *Railway Age Gazette* has already reported 1,000 cars of this order in its issue of June 8. This freight car order, together with uncompleted work on previous orders now on hand at Altoona, will keep the car shops there busy until the close of next year.

IRON AND STEEL

THE PENNSYLVANIA RAILROAD has ordered 140 tons of steel from the Phoenix Bridge Company.

SIGNALING

THE MISSOURI, KANSAS & TEXAS has ordered from the Union Switch & Signal Company the material for an electric interlocking plant, on the San Antonio Belt & Terminal, at the crossing of the Kerrville branch of the San Antonio & Aransas Pass. The machine will be type "F," with 14 working levers and 3 spare spaces. The San Antonio Belt & Terminal Railway will install a 24-lever interlocking machine at the crossing of the San Antonio & Aransas Pass, and the Galveston, Harrisburg & San Antonio, at San Antonio, Tex.; 23 working levers and one spare space. The General Railway Signal Company has been awarded the contract.

Supply Trade News

R. C. Fraser, vice-president Buffalo Brake Beam Company at New York, died on July 17 at his home at Suffern, N. Y.

The Bohannon Easer Joint Company, Ensley, Ala., announces a change in the company name to the National Steel Products Company, Inc.

George E. Scott, vice-president of the American Steel Foundries, has become associated with the work of the Red Cross at Washington on the staff of the business manager, H. D. Gibson.

G. A. Cooper, representative in the railroad department of the United States Graphite Company, at Chicago, has been appointed advertising manager of the company, with headquarters at Saginaw, Mich.

W. G. Bee, vice-president and general sales manager of the Edison Storage Battery Company, Orange, N. J., died at his home in that city July 11, aged 48 years. Mr. Bee was born in



W. G. Bee

Hartford, Conn., December 14, 1868. He left school at the age of 15 and enlisted in the United States Navy as seaman's apprentice. After four years' service he received an honorable discharge and returned to Hartford and became associated with the Pope-Hartford Bicycle Company, which later became the Electric Vehicle Company of Hartford. In this way Mr. Bee became one of the pioneers of the electric vehicle industry. In the Spanish-American War, Mr. Bee was a chief gunner's mate on the U. S. S. "Gloucester." J. P. Morgan's yacht, "Corsair." After the war Mr. Bee returned to the Electric Vehicle Company and spent some time in Mexico in its interests and was in charge of its exhibit at the Pan-American Exposition. In 1903, Mr. Bee became associated with Thomas A. Edison, then at Glen Ridge. When the Edison Storage Battery Company was organized in Orange, Mr. Bee became general sales manager, and in 1903 was elected vice-president.

The Lodge & Shipley Machine Tool Company, Cincinnati, Ohio, has elected the following new officers: M. G. Lodge, president; J. W. Carrell, vice-president and general manager, and L. A. Hall, secretary and treasurer.

The American Steel Foundries, Chicago, has purchased the Eclipse cast steel coupler yoke from the National Car Equipment Company. The Eclipse yoke requires neither keys nor rivets, and is in use on a large number of roads.

L. O. Cameron, formerly manager of sales, southern district for the Pressed Steel Car Company, has opened an office in the Munsey building, Washington, D. C., and will hereafter represent the Pressed Steel Car Company, and the Oxweld Railroad Service Company. He will also handle government accounts.

Horace M. Wigney, formerly superintendent of transportation of the Pacific Fruit Express Company, and recently president and general manager of the Dairy Shippers' Despatch Company and the Federal Refrigerator Despatch, has entered the railway supply and equipment business in his own name, with offices at 750 Railway Exchange building, Chicago.

The International Oxygen Company announces the appointment of R. M. Klein as sales manager, with headquarters at

the company's main office, 115 Broadway, New York. Mr. Klein was formerly an engineer in United States government employ. He later served as salesman and sales manager for the Diehl Manufacturing Company, and as manufacturers' representative handling a number of mechanical lines. He entered upon his new duties July 1.

The Mark Manufacturing Company, Chicago, will spend approximately \$14,500,000 in the construction of a steel plant at South Chicago. This is \$9,500,000 in excess of the cost as estimated a year ago. The new plans provide for the construction of a 600-ton blast furnace, with docks, ore and coke-handling machinery, which was not in the original plans, and also an open hearth steel department with a capacity of 250 gross tons of ingots per year.

Herbert Deeming, who has been appointed sales manager of Mudge & Co., with headquarters in the Railway Exchange, Chicago, was born in England on April 16, 1880. He began his business career as a stenographer and clerk in the general passenger department of the Fremont, Elkhorn & Missouri Valley at Omaha, Neb., in October, 1897. From July, 1899, to September he was with the American Express Company at Omaha, and from the latter month until January, 1900, he was employed in the general superintendent's office of the Fremont, Elkhorn & Missouri Valley. He was then promoted to secretary to the general freight agent of the same road, and in July, 1902, went to Chicago, where he was employed in the auditor's office of the Chicago & Western Indiana. In January, 1903, he was promoted to a position in the president and general manager's office. From July, 1903, to February, 1916, he was secretary of the General Managers' Association, at Chicago, and from November, 1907, to February, 1916, was also secretary of the Association of Western Railways. In March, 1916, he became assistant director of the Railway Educational Bureau at Omaha, Neb., and seven months later he became associated with the H. E. Reisman Advertising Company, which position he held until his recent appointment.



H. Deeming

The Walter A. Zelnicker Supply Company, St. Louis, Mo., and affiliated companies are now represented in the Birmingham district by Thomas A. Hamilton, who for the past 14 years has been connected with Crane Company, prior to which he was superintendent of the East St. Louis plant of the Zelnicker Car Works. Mr. Hamilton will have charge of both buying and selling in the southeastern district. His office will be at 1018 Woodward building, Birmingham, Ala.

Frank B. Bradley, vice-president of the Ajax Forge Company, Chicago, died at his home, in Chicago, on July 14. Mr. Bradley was born at Lake Forest, Ill., on May 6, 1866, and entered the service of the Ajax Forge Company in 1884 as an office boy. With the exception of a few years' service with the Morden Frog & Crossing Works, the Buda Foundry Company and Clement Curtis & Co., he has been continuously with the Ajax Forge Company since that time, having special charge of the sales department in recent years. In addition to his sales duties he has invented and perfected several railroad track specialties.

The Western Electric Company announces the opening of three new electrical supply warehouses, one in New Haven, Conn., at 135 Wood street, in charge of Tyler L. Holmes; a second at 425 East Oliver street, Baltimore, Md., in charge of S. Greenfield, and the third in Charlotte, N. C., at 238 West First street, in charge of R. H. Bouligny. In order to take care of the growing demands of the business in the Northwest

adequately, the warehouse and sales office of the Western Electric Company has just moved into new and commodious quarters at 84 Marion street. W. H. Quirk has been appointed manager of the Western Electric house at Cincinnati, Ohio. W. L. Sioussat will succeed Mr. Quick as stores manager in the company's Cleveland house.

J. P. Spining, who has been appointed assistant to the general traffic manager and railway sales manager of the Certain-teed Products Corporation, with headquarters at St. Louis, Mo., was born at Cincinnati, Ohio. He entered railway service with the Chesapeake & Ohio, at Cincinnati, and later served consecutively as joint ticket agent of the Cleveland, Cincinnati, Chicago & St. Louis and the St. Louis, Iron Mountain & Southern at Cairo, Ill.; city passenger agent and assistant to the assistant passenger agent of the Cleveland, Cincinnati, Chicago & St. Louis, at St. Louis; northwestern representative of the Chesapeake & Ohio at Chicago; general agent of the Big Four at Chicago, and later also general agent of the Michigan Central. After leaving the Michigan Central he became associated with Toth Brothers, New York, handling railroad accounts in eastern territory. Upon the reorganization of the Buffalo & Susquehanna he became general freight and passenger agent of that road, with headquarters at Buffalo, N. Y. On December 1, 1916, he was placed in charge of railroad sales for the Certain-teed Products Corporation in the Chicago district, which position he held until his recent appointment.

TRADE PUBLICATIONS

VISES.—The Western Tool & Manufacturing Company, Springfield, Ohio, has recently issued a booklet descriptive of the company's Champion vises.

WRENCHES AND OTHER TOOLS.—One of the latest catalogues issued by the Mechanical Specialties Company, Chicago, is a 16-page booklet illustrating and giving list prices on the company's line of wrenches, chisels, punches and similar tools.

CAR HEATING.—The Gold Car Heating & Lighting Company, New York, has recently issued a catalogue descriptive of the Gold electric thermostatic control of steam heating for passenger train cars. The booklet explains the advantages of this system from the standpoint of uniform heating and economies in the use of steam, and explains how the system secures the desired results.

ELECTRIC HOISTS.—The Sprague Electric Works of the General Electric Company, 527-531 West Thirty-fourth street, New York, have issued bulletin No. 48,923, describing Type W electric hoists, one to six tons. The various sizes and types of these hoists are clearly shown both by photographs, detailed drawings and dimension tables. General specifications for these hoists are also given.

THE STROH PROCESS.—The Stroh Steel-Hardening Process Company, Pittsburgh, Pa., has recently issued a 24-page catalogue descriptive of the Stroh process. This is a method for casting fine alloy steel together with soft steel in one solid piece, this giving a casting with a wear-proof alloy steel stratum upon the wearing surfaces, while the body is composed of any desired steel, and is in no way affected. The catalogue contains a number of illustrations showing gears, wheels, frogs, crossings, etc., of Stroh steel.

A NEW IDEA IN TWIST DRILL CATALOGUES.—The Cleveland Twist Drill Company, Cleveland, Ohio, has incorporated in its newest twist drill catalogue, No. 39, a thumb index and various other features which will distinguish it from the usual twist drill catalogue. The thumb index will enable the drill user to locate any one of the ten sub-divisions, and each index is supplemented further by a detailed index of the particular section. Each of the sections is also prefaced by an illustration graphically portraying some item in the manufacture of Cleveland tools or some unusual sales point in one of these tools. All the regular tools are shown and some of the special tools, but for the sake of brevity a number of other special tools are omitted. The book also has another good feature in that the prices of high speed tools are shown in red, thus making it easier to distinguish the lists of high speed and carbon steel tools.

Railway Construction

BALTIMORE & OHIO.—This company is building a five-mile industrial line at Baltimore, Md., which will be known as the Patapsco Neck branch, from a point near Colgate Creek station to a connection with the Sparrow's Point system, reaching the Penn-Mary plant of the Bethlehem Steel Company. A bridge will be built over Bear Creek, 1,210 ft. long, consisting of a steel draw span 210 ft., with timber trestle approaches 475 and 525 ft., respectively, and a bridge over Colgate Creek and the tracks of the United Railway & Electric Company of Baltimore. Two steel girders will span the railway and adjacent boulevard, 71 and 80 ft. in length, with a timber trestle over the creek. The work is being done by H. S. Kerbaugh, Inc., of Baltimore and New York.

CHICAGO, BURLINGTON & QUINCY.—A contract has been awarded by this road to Ralph Sollitt & Son, Chicago, for the construction of a storehouse, oilhouse, machine shop, power house and office building at Clyde, Ill. The buildings will be one-story high, of brick construction, with concrete foundation. A contract has also been awarded to G. A. Johnson & Sons, Chicago, for the building of an extension to the roundhouse at Beardstown, Ill.

CHICAGO, MILWAUKEE & ST. PAUL.—This company has awarded a contract to the McCarthy Improvement Company, Davenport, Iowa, for the construction of a freight house at Davenport. The building will be 40 ft. wide and the total length will be 409 ft., of which 79 ft. is to be two stories high and the remaining 330 ft. one story high. It will be of reinforced concrete construction and will have a Barrett specification roof. In addition to the building there will be an uncovered concrete platform 319 ft. by 40 ft.

GULF, MOBILE & NORTHERN.—This company has authorized the expenditure of \$1,000,000 for terminal development at Mobile, Ala. The initial unit of the improvement will consist of piers, warehouses and dock facilities, including 4,000 lineal feet of piers, 2,000 lineal feet of warehouses, portions of which will be two stories in height and containing approximately 200,000 sq. ft. of floor space, lumber docks with 2,000 ft. frontage on Mobile Bay, dredging and the installation of cranes and carriers for the handling and storing of cargoes. This work is to cost \$500,000 and will be begun on the completion of the final plans.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—A contract has been awarded by this company to the Thompson-Starrett Company, Chicago, for the construction of a 1,150,000-bu. grain elevator at North Minneapolis, Minn.

NEW YORK, NEW HAVEN & HARTFORD.—This company contemplates carrying out improvements on the Mystic river bridge. The present bridge is a double-track draw over the Mystic river, with span 178 ft. 7½ in. long. The company plans to construct a new superstructure of the swing draw type. The substructure work will consist of constructing four end pedestals, one at each end of the east and west piers, removing a portion of the present masonry and grillage and constructing the end pedestals at an elevation below the government channel depth. Steel cross girders are to be set on these end pedestals for the support of the ends of the new swing bridge. All the work is to be handled under traffic by supporting the ends of the present bridge on needle beams during the reconstruction.

NORTH DAKOTA ROADS.—The Dickinson, Lefor, Leipzig Construction Company has completed surveys for a railroad from Dickinson, N. D., to New Leipzig, via Lefor, Jordan and Willa, 62 miles. The plans call for stations, roundhouses and three bridges. There are no heavy grades or curves. A. A. Lefor, Lefor, N. D., is president, and N. A. Lefor is secretary and treasurer.

WESTERN PACIFIC.—The engineering department of this company is locating a line from Niles, Cal., down the Santa Clara valley to San Jose, about 13½ miles. Work will be started as soon as plans are completed, and it is expected operation will commence before June 1, 1918.

Railway Financial News

ATCHISON, TOPEKA & SANTA FE.—The Appellate Division of the Supreme Court has affirmed the judgment of the lower court dismissing the plaintiff's complaint in the suit of Francis Sherwood Male, as trustee, against the Atchison, Topeka & Santa Fe, to recover \$120,000 of principal and income of the bonds of the old Atlantic & Pacific Railroad from which the Santa Fe system grew. The prevailing opinion of the court was that the new Atchison organization was not obliged to pay the principal and interest on the bonds of the insolvent Atlantic & Pacific, which had once been sold out under foreclosure.

ATLANTIC & PACIFIC.—See Atchison, Topeka & Santa Fe.

BOONVILLE, ST. LOUIS & SOUTHERN.—George E. Mix, a St. Louis lawyer, has succeeded Walker Hill, president of the Mechanics American National Bank as trustee for the bondholders of a \$500,000 mortgage on this road. Mr. Hill was appointed trustee in 1911. Spitzer, Rorick & Co., of Toledo, O., holders of a majority of the bonds, caused this change in trustees. This firm has applied to the Federal court for an injunction to restrain the Missouri Pacific from proceeding with the foreclosure sale under a mortgage against the Boonville, St. Louis & Southern.

CHICAGO, ROCK ISLAND & PACIFIC.—James N. Wallace, president of the Central Trust Company, has been elected chairman of the finance committee in addition to being elected a director to succeed E. D. Hulbert, resigned.

See also editorial comments elsewhere in this issue.

CHICAGO & WESTERN INDIANA.—J. P. Morgan & Co. and other bankers have purchased \$15,000,000 of Chicago & Western Indiana one year 6 per cent notes, which will shortly be offered to investors. Proceeds from the sale will be used in part to pay off \$13,935,000 of two-year 5 per cent notes maturing September 1, 1917.

DELAWARE & HUDSON.—This company has sold to a strong banking group, headed by Kuhn, Loeb & Co., an issue of \$9,000,000 of three-year notes, which will carry interest at 5 per cent and be offered to investors at or close to par. Out of the proceeds \$5,000,000 will be used by the company to retire a like amount of Pennsylvania division first-mortgage 7s, which mature on September 1. This issue was put out in 1877, when money rates were high, and the company will effect a considerable interest saving annually through its retirement with 5 per cent notes. The remaining \$4,000,000 will be used for improvements and other needs. This financing will take care of all of the company's requirements for this year, and it has no other maturities to meet until 1922, when an issue of \$9,643,000 of 4½ per cent equipment notes falls due. The Delaware & Hudson planned early this year to finance itself through an issue of bonds, but the necessary permission was so long in being granted by the up-State Public Service Commission that the company on May 1 last notified that body that it did not for the present care to sell the \$4,000,000 which had been authorized. W. H. Williams, vice-president, accordingly asked the commission not to set a price for the proposed issue.

MISSISSIPPI EASTERN.—The 17-mile line extending from Quitman, Miss., to Theadville, has been sold to the Long-Bell Lumber Company, of Kansas City, Mo.

PENNSYLVANIA RAILROAD.—This company has announced that it has sold all its anthracite mining properties and collieries to M. A. Hanna & Co., of Cleveland. The terms of the sale have not been made public. The sale is one of the most important transfers of anthracite coal properties in recent years, and is the result of a determination by the Pennsylvania several years ago to divest itself of interests not directly concerned in the transportation service. The greater part of the company's hard coal property was operated by the Susquehanna Coal Company, whose entire capital stock was owned by the Pennsylvania. The company mined about 5 per cent of the entire anthracite production.

Railway Officers

Executive, Financial, Legal and Accounting

Thomas Price, assistant secretary of the Union Pacific, at New York, has been appointed secretary, succeeding Alexander Millar, resigned because of ill health.

Walter D. Beymer, who has been appointed controller of the Illinois Central, with headquarters at Chicago, as has already been announced in the *Railway Age Gazette* of July 6, was born at Clyde, Ohio, on April 10, 1866. He entered railway service in 1886 as a freight clerk with the Baltimore & Ohio, and was later bill clerk and record clerk on the same road. On September 15, 1887, he became chief clerk in the freight accounting department of the Atchison, Topeka & Santa Fe at Topeka, Kan. On March 31, 1897, he became chief clerk in the accounting department of the Central of Georgia and the Ocean Steamship Company, at Savannah, Ga., and on December 31, 1899, he was promoted to freight and passenger accountant. On June 30, 1903, he became controller, which position he held until his recent appointment as controller of the Illinois Central, with headquarters at Chicago, as already noted.

Guy J. Bunting, whose appointment as controller of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, was announced in the *Railway Age Gazette* of July 6, was born at Portsmouth, Va., on July 14, 1881. He entered railway service on July 1, 1899, with the Cashie & Chowan railroad. On February 1, 1900, he left railway service and went with the Greenleaf-Johnson Lumber Company. From January 16, 1903, to December 31, 1907, he was with the Indiana Audit Company, and from January 1, 1908, to March 1, 1909, he was with the Audit company of New York, specializing in railway auditing. On May 1, 1909, he became examiner of accounts for the Interstate Commerce Commission, and on July 16, 1911, was appointed general accountant of the Chicago, Milwaukee & St. Paul. On February 1, 1913, he was promoted to assistant general auditor, and two years later became general auditor, which position he held until his appointment as controller, as already noted.

F. N. Hallstead, assistant general paymaster of the Delaware, Lackawanna & Western, has been appointed general paymaster, with headquarters at Scranton, Pa., succeeding John H. Bessel, who has retired after a service of 50 years with the Lackawanna and its predecessors.

J. M. Schoonmaker, vice-president of the Monongahela Railway, has been elected president, succeeding J. J. Turner, who becomes vice-president; T. H. B. McKnight has been appointed treasurer, and R. R. Reed has been appointed assistant treasurer, succeeding W. N. Doulin. All with headquarters at Pittsburgh, Pa.

Operating

L. P. Blanchard has been appointed superintendent of car service of the Maine Central, with office at Portland, Me., vice W. B. Drew, who retires at his own request.

C. E. Reynolds has been appointed acting car accountant of the Virginian Railway, with office at Norfolk, Va., vice E. E. Gardner, resigned to accept service elsewhere.

J. B. McKinley, transportation inspector on the Atchison, Topeka & Santa Fe, at Wellington, Kan., has been appointed trainmaster, with headquarters at Cushing, Okla., succeeding C. E. Griggs.

W. Wackher, trainmaster of the Missouri, Kansas & Texas at Sedalia, Mo., has been appointed superintendent of the Missouri, Kansas & Texas Railway of Texas, with headquarters at Greenville, Tex., vice H. E. McGee, who has been appointed transportation officer at the government training camp at Waco.

C. B. Anderson, announcement of whose appointment as superintendent of transportation of the Chicago & Eastern Illinois, with headquarters at Chicago, was made in the *Railway Age Gazette* of July 13, was born at Momence, Ill., on August 7, 1874. He entered railway service with the Chicago & Eastern Illinois as a messenger boy in January, 1891, and several years later became clerk in the same offices. In 1897 he was made assistant cashier, and in March, 1898, became cashier. On June 1, 1907, he was promoted to agent at the Chicago freight station, and while serving in this capacity he has given much attention to methods of increasing the capacity of the present station through the use of motor trucks and similar equipment. He held the position of agent until his appointment as superintendent of transportation, as already noted.

R. E. Farmer has been appointed assistant superintendent on the Evansville & Indianapolis, with headquarters at Terre Haute, Ind., and will take over the duties formerly discharged by R. McNamar, trainmaster at Terre Haute, who has resigned to enter the service of another company.

A. C. Bowen, trainmaster on the Chicago, Milwaukee & St. Paul at Tacoma, Wash., has been appointed superintendent of the Northern Montana division, with headquarters at Lewistown, Mont., succeeding C. L. Whitney, resigned to enter military service, and J. J. Murphy, division superintendent at Three Forks, Mont., has been transferred to Deer Lodge, succeeding F. E. Willard, deceased, and will have charge of the Missoula and Rocky Mountain divisions.

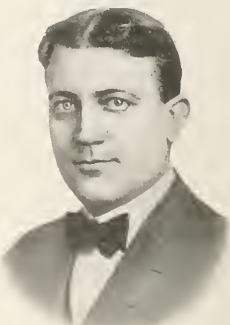
John T. McShane, whose appointment as superintendent on the Chicago, Burlington & Quincy, with headquarters at Sterling, Colo., was announced in these columns on July 6, was born at Lincoln, Neb., on August 12, 1885. He entered railway service with the Chicago, Burlington & Quincy as a call boy, and later served consecutively as operator and dispatcher at Lincoln. On April 15, 1909, he became chief train dispatcher at Omaha, and in April, 1915, was promoted to trainmaster, with headquarters at Sheridan, Wyo., which position he held until his recent appointment.



W. D. Beymer



C. B. Anderson



G. J. Bunting

Frank A. Leith, whose appointment as superintendent of the Chicago, Terre Haute & Southeastern, with headquarters at West Clinton, Ind., was announced in these columns on July 13, was born at Nathan, Ill., on April 27, 1871. He entered railway service with the Illinois Central in July, 1892, and served consecutively until 1899 as telegraph operator, agent and despatcher. In 1899 he became chief despatcher on the Vandalia, and in 1902, was despatcher on the Southern Indiana. On February 1, 1915, he was appointed chief despatcher on the Chicago, Terre Haute & Southeastern, and in December, 1916, was promoted to assistant superintendent, which position he held until his recent appointment.

Fred E. Sanborn, whose appointment as general superintendent of the Maine Central, with headquarters at Portland, Me., has already been announced in these columns, was born on November 15, 1865, at Portsmouth, N. H., and was educated in the common schools. He began railway work on May 1, 1881, with the Maine Central, as office boy in the Portland (Me.) local freight office, and subsequently served as clerk in the office of the general western freight agent. In 1883 he became a train brakeman, and three years later was appointed baggage master. He subsequently served as conductor until 1901, when he was appointed trainmaster, and later became superintendent of the Portland division, which position



F. E. Sanborn

he held at the time of his recent appointment as general superintendent of the same road, as above noted. Mr. Sanborn's entire railway service has been with the Maine Central.

Edward Samuel Moore, who has been appointed superintendent of transportation of the Norfolk & Western, with headquarters at Roanoke, Va., as has already been announced in these columns, was born on September 30, 1880, at Newport, Pa., and was educated in the common schools. He began railway work in 1896, with the Norfolk & Western, as a messenger in the telegraph office at East Radford, Va., and about one year later resigned to continue his school studies. In 1898, he returned to the service of the Norfolk & Western, as stenographer to the car service agent, and was promoted in 1903 to chief clerk, which position he held at the time of his recent appointment as superintendent of transportation of the same road as above noted.

J. R. Talbott, who has been appointed superintendent of car service of the Norfolk & Western, with headquarters at Roanoke, Va., as has already been announced in these columns, was born on August 24, 1874, at Ashland, Ky., and was educated in the grammar schools. He began railway work in May, 1890, as a yard clerk on the Norfolk & Western at Coal Grove, Ohio. In January, 1892, he was transferred to Columbus as a clerk in the car accountant's office, and the following November was again transferred to Roanoke, Va., to the car record office. In April, 1899, he was promoted to traveling car agent, and in May of the following year became chief clerk in the car record office. He was promoted to car accountant in October, 1907, and now becomes superintendent of car service of the same road, as above noted.

James H. Aydelott, whose appointment as division superintendent on the Chicago, Burlington & Quincy at Hannibal, Mo., was announced in the *Railway Age Gazette* of July 6, was born in Jersey county, Ill., on August 13, 1883. He entered railway service with the Chicago, Burlington & Quincy on September 15, 1902, as a clerk in the mechanical department. In February, 1908, he became chief clerk in the superintendent's office at St. Joseph, Mo., and later served successively until March, 1916, as chief clerk in the general superintendent's office at St. Louis, and chief clerk in the general manager's office, at Chicago. In

March, 1916, he was promoted to special inspector on the general manager's staff at Chicago, and in May of the same year became trainmaster at La Crosse, Wis., which position he held until his recent appointment.

George H. Alexander, who has been appointed superintendent of freight transportation of the New York Central, lines east of Buffalo, with headquarters at New York, as has already been announced in these columns, was born on November 8, 1868, at Mobile, Ala., and was educated in the public schools of his native town. He began railway work in February, 1886, as stenographer and bookkeeper in the accounting department of the Mobile & Ohio, and later served as chief clerk in the division and general superintendent's offices. In June, 1894, he entered the service of the New York Central as chief clerk in the superintendent's office at Watertown, N. Y., and from October, 1901, to December, 1906, was traveling auditor at Rochester, N. Y. He was then appointed car accountant, remaining in that position until May, 1911, when he was appointed superintendent of car service at New York, which position he held at the time of his recent promotion, as above noted.



G. H. Alexander

William Spencer Taylor, who has been appointed superintendent of the Cincinnati Terminal division of the Chesapeake & Ohio, with headquarters at Covington, Ky., as has already

been announced in these columns, was born on May 12, 1868, at Lynchburg, Va., and was educated in the public schools. In the spring of 1882 he began railway work as waterboy in work train service on the Virginia Midland, now a part of the Southern system; the following spring he was appointed brakeman on the same road. In the winter of 1884 he went to the Norfolk & Western at Lynchburg, Va., and six months later was promoted to yard conductor. In February, 1880, he went to the



W. S. Taylor

Richmond & Allegheny as night yardmaster at Lynchburg, and later was in the service of its successor, the Chesapeake & Ohio. In December, 1897, he was appointed day yardmaster at Clifton Forge, Va., remaining in that position until June, 1911, when he became general yardmaster at Brighton, Ohio. On September 15, 1911, he was promoted to terminal trainmaster, with office at Summit, Ohio, and in February, 1913, his authority was extended and his headquarters were transferred to Covington, Ky. In February, 1914, he was appointed superintendent of terminals, with headquarters at Covington, which position he held until his recent appointment, as above noted.

Porter W. Sullivan, whose appointment as division superintendent on the Pennsylvania Lines West, with headquarters at Akron, Ohio, was announced in the *Railway Age Gazette* of July 13, was born at Buffalo, N. Y., on September 29, 1873. He entered railway service with the Pennsylvania Lines on June 1,

1890, as a clerk in the local freight office at Columbus, Ohio. On July 1, 1893, he became stenographer and clerk in the office of the superintendent of the Cleveland and Pittsburgh division, and on January 1, 1901, was promoted to chief clerk to the superintendent. On November 1, 1902, he was appointed assistant trainmaster, and in 1904 was assigned to duties in connection with the World's Fair at St. Louis, Mo. In 1907 he was special agent in charge of the Pennsylvania Railroad exhibit at the Jamestown (Va.) exhibition, and on January 1, 1912, became chief clerk to the general superintendent of the central system of the Pennsylvania Lines West, which position he held until his recent appointment.

Traffic

M. J. Beyans has been appointed division freight agent of the Baltimore & Ohio, with headquarters at New York.

J. S. McConnell has been appointed commercial agent on the Louisiana & Arkansas, with headquarters at Houston, Tex.

A. S. Edmonds has been appointed assistant freight traffic manager of the Missouri Pacific, with headquarters at St. Louis, Mo., effective July 10.

L. E. Poley, commercial agent of the Nashville, Chattanooga & St. Louis at Macon, Ga., has been appointed general eastern agent, with office at New York.

A. D. Maxwell has been appointed commercial agent of the Atlanta, Birmingham & Atlantic, with office at Waycross, Ga., vice H. G. Dowling, transferred.

J. J. Rose, Canadian passenger agent for the Union Pacific, with headquarters at Toronto, Can., has been appointed general agent, with jurisdiction over both freight and passenger business, with the same headquarters.

B. W. Herrman, assistant general freight agent of the Norfolk & Western, with headquarters at Columbus, Ohio, has been appointed general freight agent with the same headquarters. The office of assistant general freight agent has been abolished.

M. C. Markham has been appointed assistant to the vice-president in charge of traffic of the Missouri Pacific, with headquarters at Chicago. P. J. McCarthy, assistant general freight agent at Chicago, has been transferred to St. Louis, Mo. The position of assistant general freight agent at Chicago has been abolished.

R. R. Trimble, general agent of the Missouri Pacific, with headquarters at Buffalo, N. Y., has been appointed general agent of the passenger and freight departments, with headquarters at Tulsa, Okla., and the office of general agent at Buffalo has been abolished; P. E. Watson has been appointed general agent of the passenger and freight departments, with headquarters at Pueblo, Colo., succeeding B. E. Sells, deceased.

H. T. Duffy, district passenger agent of the Minneapolis, St. Paul & Sault Ste. Marie, at Moose Jaw, Sask., has been appointed general agent, with headquarters at Toronto, Ont., succeeding F. A. Mancekivell, resigned. R. H. Ziebell, traveling agent with headquarters at Minneapolis, Minn., has been appointed district passenger agent at Moose Jaw, Sask., succeeding Mr. Duffy.

Engineering and Rolling Stock

A. H. Beirne has been appointed master mechanic of the western division of the Atchison, Topeka & Santa Fe, with headquarters at Dodge City, Kan., succeeding Edward Norton.

J. J. Hanlin, master mechanic of the Seaboard Air Line at Howells, Ga., has been appointed assistant superintendent of motive power, with headquarters at Portsmouth, Va., effective July 1.

M. F. Smith, district master mechanic of the Chicago, Milwaukee & St. Paul at Dubuque, Iowa, has been transferred to Milwaukee, Wis., succeeding A. Young, resigned to enter military service.

A. J. Bisbee, assistant engineer on the Chicago, Rock Island & Pacific at Chicago, has been appointed valuation engineer of the Evansville & Indianapolis, with headquarters in the office of the engineer maintenance of way, Terre Haute, Ind., succeeding N. C. Van Natta, resigned to go with another railroad.

E. H. Barnhart, division engineer maintenance of way of the Baltimore & Ohio, at Wheeling, W. Va., has been transferred to Baltimore, Md., succeeding Richard Brooke, resigned to enter military service, and P. A. Beatty, assistant engineer at Baltimore, has been promoted to division engineer maintenance of way, with headquarters at Wheeling, succeeding Mr. Barnhart.

H. T. Ruhl, who has been appointed engineer maintenance of way and structures of the Delaware & Hudson, with headquarters at Albany, N. Y., as has already been announced in these columns, began railway work in 1902 as a rodman on the Canadian Pacific. From 1904 to 1905 he was transitman, and then to 1908 was resident engineer at Toronto, Ont. In 1908 he was appointed senior transitman at North Bay; the following year he became resident engineer at Sudbury, and from 1911 to 1913 was resident engineer at Farnham on the same road. He left the service of the Canadian Pacific in 1913 to become resident engineer on the Canadian Government Railways, at New Glasgow, and in 1915 was promoted to division engineer at Moncton, N. B., which position he held at the time of his recent appointment as engineer maintenance of way and structures of the Delaware & Hudson, as above noted.

Purchasing

S. F. Langton has been appointed division storekeeper on the Atchison, Topeka & Santa Fe, at Seligman, Ariz., succeeding S. C. Fogarty.

Special

George A. Cullen, passenger traffic manager of the Delaware, Lackawanna & Western, with office at New York, has become associated with the work of the food administration at Washington as head of the division of co-operative organizations, food conservation department, and is engaged in co-ordinating the work of various organizations throughout the United States in carrying on an educational campaign for food conservation.

As noted in last week's issue, Edward Chambers, vice-president of the Atchison, Topeka & Santa Fe, has been appointed assistant to H. C. Hoover, food administrator at Washington, and will act as an advisor on transportation matters. Mr. Chambers was born on February 16, 1859, at Waukegan, Ill., and was educated in the public schools. He entered railway service in 1878 as freight handler for the Atchison, Topeka & Santa Fe at Pueblo, Colo.; later agent and commercial agent at various Santa Fe system since that time, principally in the traffic department. He was check clerk, transfer foreman and cashier at Pueblo, Colo.; late agent and commercial agent at various points, assistant general freight agent at Los Angeles, and general freight agent of the lines west of Albuquerque, N. M. In March, 1915, he was appointed assistant freight traffic manager of the Coast Lines, and on June 1, 1913, he was elected vice-president in charge of traffic.

Railway Officers in Military Service

Edgar S. Nethercutt, acting secretary of the Western Society of Engineers, Chicago, has been commissioned major in the Engineer Officers' Reserve Corps.

N. D. Ballantine, assistant to the second vice-president of the Chicago, Rock Island & Pacific, at Chicago, has been commissioned major in the Engineer Officers' Reserve Corps.

Thomas W. Saul, division engineer of the Oregon-Washington Railroad & Navigation Company, with headquarters at Portland, Ore., recently enlisted in the Eighth Regiment of Engineers, United States army, and is now in training at American Lake, Wash.

Richard Brooke, division engineer maintenance of way of the Baltimore & Ohio at Baltimore, Md., has received a commission as captain in the Engineers' Officers Reserve Corps, and has been assigned to duty with the Fifth Engineers, National Army, at Pittsburgh, Pa.

OBITUARY

W. H. Anderson, superintendent of the Kentucky Central division of the Louisville & Nashville, died at a hospital in Paris, Ky., on July 18, at the age of 58.

Railway Age Gazette

Volume 63

July 27, 1917

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GENERAL NEWS SECTION

The average employee in a commercial business recognizes that his interests and his company's interests are identical.

Employees As Molders of Sentiment

Unless the business prospers he cannot hope for increased wages, and consequently he promotes the welfare of the concern in every possible way that he can. He is not only energetic in discharging his routine duties but keen to seize opportunities to raise his company in public esteem.

Unfortunately, railroad employees have been lacking in this respect and much can be accomplished if they are properly stimulated. Sometime ago T. J. Foley, general manager of the Illinois Central, discovered what far-reaching results followed a common sense expression of opinion by a conductor favorable to his road. This led him to consider the possibilities of enlisting train service employees as missionaries on public relations in conjunction with their duties in daily contact with the patrons of the company. In a bulletin, summarized elsewhere in this issue, he calls the attention of trainmen and engineers to the good effects of a statement of fact now and then, when in the interests of the road's welfare, and announces that he intends to issue circulars from time to time, setting forth concrete and illuminating statistics concerning the affairs of the Illinois Central and the railroad situation generally. Some of the employees, prejudiced by a tradition of antagonism toward the management, may not be of much assistance in the campaign that Mr. Foley contemplates, but the more intelligent men will be able to accomplish much if they are sufficiently courteous in presenting their ideas to the traveling public. It is obvious that they are not trained debaters and that, should they be too insistent in expressing their views, they might do more harm than good. Therefore, the importance of tact and caution should be strongly impressed on them. The possibilities of a campaign of education through train service employees are indeed great. Perhaps no other one factor could more effectively assist the railroads in securing recognition of their real needs than a general presentation of their side of the case by these employees. No less important than the direct advantages to the railroads accruing from this plan would be the educational benefits to the men which would be derived from a series of circulars such as Mr.

Foley contemplates. When train service employees learn the truth, they will realize that the carriers cannot be milked without end, but must be nourished and fostered if the public is to have satisfactory service and employees better wages.

German Railways as Indemnities

The German railways proved one of Germany's strongest weapons in launching the war; they have proved one of her most dependable weapons for carrying on the war. Are they going to prove one of the means for securing peace? The London Statist in a recent issue observes that the time has now come when the allied governments should begin considering the question of indemnities. The allies, it believes, should be prepared when peace negotiations get under way to say what they will or will not allow if Germany represents that she has already incurred liabilities of five billion pounds sterling (\$25,000,000,000). There should also be carefully studied and considered, it goes on to observe, what possessions of Germany—railroads, banks, mines, shipping, etc.—it is reasonable to look upon as disposable for the payment of indemnities. "There is one very important category of properties which ought to be looked upon as available for paying indemnities; and it is the railways. The German governments, speaking generally, own their railways; and those governments clearly ought to be made to hand over their railways, even if not a single mile is left to them, to make good all the losses inflicted upon countries like France, Belgium and Serbia." Imagine a country having to lose its railways in this fashion! Think of a modern industrial and commercial nation in these days without its railway lines! Surely this is a cold blooded, soulless proposition. But, then, is it so bad, considering the things that Germany has done? "Nobody who has any regard for human justice, or human prosperity," says the Statist, "will seriously dispute that all damage done, say, in the occupied provinces of France, in Belgium, in Serbia and so on, ought to be made good to the uttermost farthing. If Germany is allowed to burn down private houses, to massacre the inhabitants, and to kill their cattle, then future German governments meditating a war of

* Illustrated.

revenge, will feel that they may safely run the risk. If, on the contrary; every penny that can be taken hold of is used to pay to the uttermost all damage done, future governments will think twice before they engage in a fresh war of revenge."

Many of the lessons of the war emergency, as some of us have learned, are different from ordinary lessons mainly in degree, or frequency or intensity, not different in kind. This is illustrated in the last accident report of the British Board of Trade, noticed in another column. In a collision due to an error in

A Little Lesson from Britain

manual block signaling, the operator at one of the stations, Station A, was a woman, and the driver of one of the trains was a boy of 17 years; two abnormal elements in the case due to war conditions. But it is to be noted that the mistake or inefficiency chargeable to the operator was not due to her being a woman, and the driver's mistake was not due to his youth; in both cases it was lack of training. Judging by facts of real life and not by book precepts, one concludes, without doubt, that the trouble was inexperience; the lessons which those two should have learned, but did not, are acquired only by practice. The Board of Trade inspector does not, of course, censure the company for employing women or boys, under the present stress; and it is not for any one else to say that there was any culpable neglect in the training of these novices; but for present or future situations the warning is, simply, to stick to well-settled principles. If a girl needs a year's training the officer in charge must be alert and begin the training, if possible, a year before she is going to be put at work. If a motorman is going to be entrusted with responsibilities requiring varied experience, the experience must be provided, even if it has to be produced artificially. Forethought, inspection, testing and other safeguards are required always; the present demand is for more forethought, more patient inspection, more care to see that no tests are omitted. The War Department, we are told, is going to "learn from England's errors"; let us do the same.

MECHANICAL DEPARTMENT VALUATION

IN view of the difficulties that have been experienced by the mechanical departments of many roads when starting the Federal valuation work, an article by W. R. Maurer, mechanical engineer of the New York, New Haven & Hartford, is printed elsewhere in this issue giving a number of timely suggestions on mechanical valuation work. Mr. Maurer has had considerable experience in various valuations made of the New Haven and having about completed the Federal valuation, is well qualified to make constructive suggestions. It must be remembered, however, that these suggestions apply directly to the work on the New Haven and to the valuation district in which that road is located, and that some of the suggestions made by Mr. Maurer may not be applicable to other districts, as the practices have not been generally standardized.

In the preparation of original cost to date schedules, too much dependence cannot be placed on the figures furnished by the accounting department as to the completeness of the information desired. Many additions and betterments have not been recorded and these in the aggregate will represent a large amount of money. If the mechanical department does not give this most careful attention, the credit for these expenditures will be lost. Many improvements have been made in the shop of which there is no record. The work of ferreting out these items should be started well in advance of the arrival of the government parties for it is a large task. It is necessary that a man thoroughly familiar with the mechanical department equipment be in

charge, or directly connected with the valuation work done in that department.

Some roads use a more comprehensive form of recording the inventory on shop machinery than that shown by Mr. Maurer. This it seems, should be governed by conditions and what the local valuation district board desires. The matter of inventorying the small tools has been the source of some discussion. Some claim that if the work is left entirely in the hands of the local foreman a lot of material will not be recorded due to the workmen being reluctant to show the number of tools they are keeping in their lockers. Some roads have found it necessary to make a very complete search in order to get a correct record of this class of material.

Contrary to the opinion held by some railroad men, the equipment and material under the jurisdiction of the mechanical department forms an appreciable percentage of the physical value of a road. There is so much detail and such a large number of individual items in the mechanical department that the work of valuing the equipment in its charge should be placed in the hands of a man who is thoroughly familiar with that department and with what has been done to the equipment and shops. The mechanical department organization should do its full share of the valuation work and thus protect the interests of the company.

"CAR SHORTAGE" COMMODITY PRICES, AND THE COST OF LIVING

THE Council of Defense of Illinois has been investigating the situation with respect to the production of coal in that state. A number of coal operators who appeared before the council this week testified, as reported in the newspapers, that "increased railroad facilities, especially additional coal cars, would lower the price of coal in Illinois." This view is doubtless correct. Increased railroad facilities would tend to lower the prices of many commodities throughout the United States. The inadequate expansion of the railroads within recent years has been one of the causes of the increases in the cost of living, and, paradoxical though the statement may seem, it has also injured many producers by reducing the prices they otherwise would have received for their products.

To recognize the fact that the inadequacy of railroad facilities has had these effects is not, however, to condemn the managements of the railroads. It is merely to condemn the policy which has limited railway expansion. That policy has not originated with the managements. It has originated partly with the shippers, many of whom now complain that they cannot get enough cars. It is chargeable still more largely to the anti-railway agitators and politicians who have persisted in reducing the profits of the railroads regardless of consequences. If the roads had been allowed to make reasonable profits during the last ten years the prevailing car shortage and congestion of traffic would not exist, or at least would not exist to the degree that they do, and the adverse effect which they have upon the welfare of the country would not be produced.

It is a generally recognized fact that the rates charged for transporting agricultural products, coal and other commodities from the points of production to the points of consumption affect both the prices which the producers receive and those which the consumers pay. Another fact, which is even more important, but which is not so generally recognized, is that the price which the producer can get and the price which the consumer must pay are largely determined also by the adequacy and character of the transportation service rendered in moving commodities from the places where they are produced to the places where they are consumed. Take coal, for example. We need not theorize regarding the effect of the car shortage on the prices received and paid for it. Under the conditions existing for some time we have

had, on the one hand, great industrial centers in which the demand for coal for manufacturing and other purposes has suddenly and enormously increased. On the other hand, we have all over the entire country, and in most cases remote from the great industrial centers, coal mines with a productive capacity far exceeding their maximum past output. The connecting link is the railroad. The railroads have moved more carloads of coal from the mines to the consuming centers within recent years than they ever did before. But the demands of the consuming centers have exceeded the capacity of the railroads. Therefore, the prices at the consuming centers have advanced to unprecedented heights, in spite of the fact that more coal has been delivered at these points than ever before. The mines, on the other hand, in spite of the fact that they have produced more coal than they ever did before, have not been able to get enough cars to move all the coal which they could produce. Since their productive capacity has exceeded the transportation capacity available the prices at the mines have not advanced as much in proportion as they have in the consuming centers, and in consequence relatively the largest profits which have been made in the coal business have been made not by the operators, but by the coal speculators in the large industrial centers. If the railroads had been able to move more coal the operators would have been able to have sold more and made more money from a larger output, while at the same time the consumers would have had to pay less, because the supply would have been nearer equal to the demand.

The same reasoning applies to agricultural products. The farmer will get relatively the best prices for his products, and the consumer in the large industrial centers will pay relatively the least for them when the railway facilities are sufficient to move all the crops of the country when market conditions are favorable and within a reasonable time. On the other hand, when transportation facilities are inadequate the supply moved to the industrial centers is insufficient and prices there go up, while at the same time the tonnage left upon the farms is excessive and in consequence the prices received by the farmer are less than they otherwise would be. In these circumstances, the speculator, through whose hands the products go from the farmer to the consumer, is the man who makes relatively the largest profits.

There is another feature of the situation which often is overlooked. This is that the drastic regulation of railway profits in recent years, by preventing the construction of new railway lines, has hindered the opening up of new territories, and has thus limited the increase in the supply of agricultural products, of forest products, of products of mines and of almost every other class of commodities. This also, of course, has tended to increase the cost of living.

It will be readily understood that if railway transportation suddenly should be entirely suspended there would be a great increase in the prices of all kinds of commodities in the large centers of population and industry and at the same time a sharp decline in the prices of commodities at the points of production. Now, a deficiency of railway transportation differs only in degree from a complete interruption of it and consequently its effects, although less serious, are similar. Our policy of regulation having failed to recognize the fact that the adequacy and quality of the service rendered has just as important an effect upon the prices which producers receive for their commodities and which consumers must pay for them as the rates which the railways are allowed to charge, the result has been that we have got low rates, but not adequate facilities. The main trouble with our entire policy of regulation is that it has been founded upon a false principle. This is that the great object of regulation should be to restrict railways to a net return which will barely avoid confiscation of their proper-

ties. The fundamental principle of regulation should be that the railways should be allowed to earn a net return which will be sufficient, and no more than sufficient, to enable them adequately to develop their facilities and service. We shall make no progress with the solution of the railway problem until our regulating authorities adopt and act upon this principle.

CAR SHORTAGE AGAIN REDUCED

THE rapid reduction of the freight car shortage since the organization of the Railroads' War Board, in spite of a large increase in the volume of traffic at a season which usually shows considerable decrease, is potent evidence of the value of centralized control which was put into effect when the regulation of freight car supply was delegated by the board to its sub-committee, the Commission on Car Service, under new car service rules adopted April 26. On May 1 the car shortage was 148,627, greater than it has ever been before at that time of the year. On June 1 it had been reduced to 106,649, although the amount of freight handled in May was greater than in April, and on July 1 the shortage had been still further reduced to 77,144, a decrease of nearly 50 per cent in two months. The statistics showing the increase in business in June are not yet available, but it has been shown by government reports that the tonnage of bituminous coal handled was 26 per cent greater than in June, 1916. Many methods have entered into the accomplishment of this result. Many of them, such as the unusual efforts that have been made to increase the mileage per car per day, to increase the train load, to get cars loaded and unloaded more promptly, and to have them loaded to capacity, are by no means new, but they have been made more effective by pressure of necessity as well as by the patriotic impulse which has brought about the hearty co-operation of shippers and regulating authorities.

A new factor in the situation has been the fact that the freight equipment of the country has been pooled under the direction of the Commission on Car Service. This commission not only has kept constantly in touch with the requirements of railroads and shippers for cars needed for particular shipments, and has arranged for providing them, but in addition to conducting the campaign for greater efficiency in the use of equipment has freely exercised its power to order the movement of cars in large numbers from roads on which they have accumulated to roads where there was a shortage. These cars have been moved mainly in train-load lots from eastern ports to southern and western lines after a most careful study by the Commission on Car Service of the requirements of the situation. In making these distributions of cars the Commission has not attempted to give each line 100 per cent of its ownership. The principle which it has followed was announced in its first general order, stating that roads having on their lines in excess of 100 per cent of their ownership of equipment must so regulate their car handling as not to exceed the percentage as of April 1, or as may be designated by the commission. The date April 1 was selected as representing in a general way what may be called the normal for prevailing conditions of traffic, after six months of regulation by the Commission on Car Service.

NEW BOOKS

Railroad Valuation and Rates. By Mark Wymond. Published by Wymond & Clark, 909 Rand McNally building, Chicago. 344 pages, 5 in. by 8 in. Bound in buckram. Price \$1.50.

This book is intended primarily as a treatise on the principles of rate-making and their relation to valuation and rate regulation by an author who has had some 30 years of experience in connection with the promotion, construction, operation and valuation of railroads and in making investi-

gations and engineering reports, and has also had considerable experience in the investigation of rate questions. For the purpose of obtaining the proper perspective the first four chapters are devoted to the historical development of the railways with special reference to their promotion, construction and reconstruction and capitalization.

The author also says that these chapters are inserted in order to correct the erroneous impressions of railroad promotion and capitalization which many people have gained from a few notorious instances that have been the subject of public investigation. Methods of railroad construction are described in detail for the purpose of showing the elements which enter into the value and the author contends that while the cost of reproduction new is the fair value of the physical property at the time of valuation, the total commercial value of a railroad does not necessarily bear a direct relation to the cost of reproducing its physical property or the amount of its capitalization. He says, however, that if depreciation, other than deferred maintenance, is deducted from reproduction cost to determine the present value and the amount in which railroads will be allowed to earn a fair return, railroad borrowing for the purpose of providing extensions and betterments of existing railroads will be practically barred. The author finds that the valuation will not definitely fix the proper general level of rates, but will merely establish a line below which the general level of rates may not go without being confiscatory, that the rate of return on value will be greater for some roads than for others, and that as to the adjustment of rates in detail the valuation is not applicable.

The entire work is an interesting and unbiased discussion of a subject on which many people have very hazy ideas and it is well worth the attention of all who are interested in the questions raised by the valuation of American roads now being made under the direction of the Interstate Commerce Commission.

Concrete, Plain and Reinforced. By Frederick W. Taylor and Sanford E. Thompson. 885 pages, illustrated. 6 in. by 9 in. Bound in cloth. Third edition. Published by John Wiley & Sons, 432 Fourth avenue, New York. Price \$5.00.

Since the second edition of this well known treatise was published one of the authors, Mr. Taylor, has died. In consequence this last revision is the work of Mr. Thompson and his collaborators. The new edition brings the book up to date with the latest developments in the design and construction of plain and reinforced concrete. With the more thorough establishment of the fundamental principles and properties of this important building material, 50 less pages have been devoted to the properties of cement, aggregates, the theory of proportioning, methods of mixing, etc. On the other hand more space is given to the theory and design of reinforced concrete. Thus 18 pages are devoted in the third edition to flat slab design as compared with 5½ pages on this subject in the second edition. An improvement has also been made in this section in the sub-division of the subject under three separate heads—principles, tests, and design of reinforced concrete. These three chapters constitute an extensive rewriting of the original material. The chapter on tests in particular shows the benefit of the material available since the last edition. The discussion of the strength of plain concrete has been extensively revised as well as the chapters on the mixing and depositing of concrete. The trend of modern practice is indicated by the smaller space devoted to rammers. Also in the chapter on mixing, where the earlier volume called attention to the advantages of machine mixing, the latest one states that "machine mixed concrete may be about 25 per cent stronger than hand mixed." The chapters on the chemistry of hydraulic cement, the proportioning of concrete, the effect of sea water and arches, all written by special authors, appear substantially in the original form but indicate careful revision as to minor details.

Letters to the Editor

FOLLOW-UP CORRESPONDENCE OVERDONE

ATLANTA, Ga.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

American tradesmen have an objectionable habit of bombarding a man with follow-up correspondence without inquiring whether the person addressed has authority to make purchases for the company he represents. It happens that I am a railroad officer and now have in my files probably 150 catalogs of business firms. It is rare that a requisition on the storehouse is turned down if I send it the catalog number, manufacturer, list price, and such information as can be gleaned from the ordinary catalog.

When writing for catalogs I almost invariably state that they are for my files, and material, if purchased, will be ordered through our storehouse. Of course, my name will not usually appear in the transaction anywhere after I make the requisition, as the material is sent to the storehouse and from there forwarded to such destination as I may state in my requisition. However, invariably a request for a catalog is followed by a series of letters from the firm, usually about four days apart, demanding to know why it has not heard from me, why its goods are not being sold in my territory and asking a thousand other questions. The consequence is, in many cases I consign the correspondence to the waste basket and have nothing more to do with the firm. I believe that the follow-up correspondence business is overdone in this country.

IMPATIENT.

HOW THE ALLIES CAN REDUCE THE TRAFFIC CONGESTION

St. Louis, Mo.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

In my opinion the solution of the present car shortage in the south is largely in the hands of the allied governments in moving their war materials and supplies.

The allies are handling between a million and a million and a half tons of freight per month to the ports for export. The greater part of this movement originates north of the Ohio and Potomac rivers in the section where cars are most plentiful and if it could be arranged to use South Atlantic and Gulf ports, Norfolk to Galveston, inclusive, to a greater extent, it would mean that cars would be moving under load from the territory where they are more plentiful to the territory where freight cars are mostly needed for return loading.

Notwithstanding all that has been done by the Interstate Commerce Commission and various A. R. A. committees, congestion still continues at the North Atlantic seaboard, where lines have on their rails substantially more than the equivalent of 100 per cent of their ownership, whereas southern and southwestern lines continue to suffer from shortage by reason of having percentages of cars on line ranging from 80 down to 50 per cent of ownership.

During this period when there is a load for every car in existence regardless of where it is, it seems to be an economic waste to move cars empty to bring about the proper distribution of available equipment. Therefore, the foregoing suggestion as to more liberal use of South Atlantic and Gulf ports in the handling of export traffic may have some merit. To accomplish this, it would, of course, be necessary to direct a larger number of vessels to South Atlantic and Gulf ports for loading.

TRAFFIC MANAGER.



Queens Boulevard Bridge, Showing the Construction Plant at the Street Level

South End of the New York Connecting Railroad

The Four-Mile Line Being Built for Freight Interchange Between the Pennsylvania and the New Haven

THE New York Connecting Railroad which the New York, New Haven & Hartford and the Pennsylvania are now building jointly on Long Island is nearing completion. When finished, it will materially shorten the car ferry service for the interchange of freight traffic, while the north end which is now completed provides a direct connection between the two railroads for passenger traffic. The northern end of the line, known as the East River Bridge division, leaves the Harlem river branch of the New Haven at 142nd street in the Bronx and extends south, crossing Bronx Kill to Randall's island, then over Little Hell Gate to Ward's island, then across the Hell Gate arch bridge to Long Island and terminates at Fourteenth avenue, formerly

vides a direct connection between the two railroads for passenger traffic and through trains are now operated from Boston to Washington.

The new double-track freight line continues south from Twentieth avenue through Woodside and Winfield, crossing the main line and Montauk division of the Long Island and terminates at Fremont street, about one-quarter mile south of Fresh Pond Junction, where connection is made with the Manhattan Beach division of the Long Island, which has been improved to care for the additional traffic. Freight trains will use the Beach line from Fresh Pond junction to the Bay Ridge terminal where they will be broken up and the cars transferred to the Greenville (N. J.) freight



Map and Profile of the Line Between the Bronx and Fresh Pond Junction

Stemler street, in Astoria. This portion of the line has four tracks, two of which are for freight traffic and two for passenger.

The four-track section continues south from Fourteenth avenue to Twentieth avenue, formerly Bowery Bay road, where the passenger and freight lines diverge. The two passenger tracks extend south and west to a connection with the Pennsylvania line leading through Sunnyside yard and the Pennsylvania tunnels under the East river, Manhattan island and the Hudson river. This portion of the line, which was opened for traffic on April 1, was described in detail in the *Railway Age Gazette* of September 3, 1915. It pro-

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unfavorable currents. By the new route, the operation of the ferry is simple and its length only slightly exceeds three miles. Contrasted with the present route which requires six hours average time per trip, the new route will effect a saving in ferrying of approximately 11 miles and it is estimated that the time required per trip will be reduced to one hour or less.

While for the present only two tracks will be built from Twentieth avenue south to Fresh Pond junction, provision has been made to widen the cuts and structures for two additional tracks when the traffic warrants the expenditure. On the completion of the two tracks the new line will be placed in service and the old freight transfer route through Hell Gate will be abandoned. Freight originating in New England and destined for points south and west will be routed via the Connecting Railroad and the Manhattan Beach line to Bay Ridge where the trains will be broken up and transferred to Greenville by car floats. The operation of the New York Connecting will be directly in charge of the New Haven to Fresh Pond junction, while from that point to Bay Ridge it will have trackage rights and the New Haven trains will run over the tracks of the Long Island Railroad on this basis.

The agreement for trackage rights for the New York Connecting trains between Fresh Pond junction and Bay Ridge is for through movements only and does not permit local deliveries. Freight to and from Long Island points and from and to points on the New Haven will be interchanged at Fresh Pond junction.

Provision is being made for the electrical operation of the passenger line, but until the completion of the electrification, steam will be employed. The New Haven runs its passenger train with its crews and steam locomotives through to Sunnyside yard. The freight service will also be operated by New Haven crews. The terminal yard and float bridges at Bay Ridge will be in charge of and operated by the Long Island, while the float service between Bay Ridge and Greenville will be performed by New Haven tugs and floats.

CONSTRUCTION FROM TWENTIETH AVENUE TO JUNIPER SWAMP

The construction of the line from the passenger connection south to and across Juniper swamp, a distance of $3\frac{1}{4}$ miles, which is being done by the Wilson & English Construction Company of New York City, is nearing completion. The earthwork on this section which is very heavy, totaling \$28,000 cu. yd. exclusive of that yet to be done through Juniper swamp, required the making of cuts ranging from 50 ft. to 65 ft. in depth and embankments 45 ft. high. The material encountered in the cuts was largely gravel which was moved by steam shovels and loaded into narrow-gauge cars for delivery to the fills. In the larger fills trestles were provided to carry the construction tracks.

Through Juniper swamp the subgrade is to be 10 ft. below the surface, requiring about 800 ft. of special construction through the soft material encountered that extends to a depth of 36 ft. It has been planned to first place a fill by means of a trestle and when the settlement has subsided, to excavate the cut. Many difficulties have been encountered in building the trestle as the force resulting from the settlement has been sufficient to wreck all that have been built to date. To improve the conditions the swamp will be drained by means of pipes and side ditches that will carry the water to a small brook at Winfield about 6,000 ft. north.

The masonry work on this section consists of 22 concrete bridges, including two arches under and three arches over the railroad and a three-span arch structure over Queens boulevard. At Patterson and Burnside avenues the railroad will be carried over the streets on single span, reinforced arch bridges having clear spans of 84 ft. each. The bridges are both of the filled spandrel type with mass section span-

drel walls connected by means of transverse walls. The arch rings are segmental in form with a span of 83 ft. 10 in. and a rise of 19 ft. 6 in. They are about 36 ft. in height and have a length of 220 ft. The structures are thoroughly waterproofed and are founded on Raymond concrete piles, reinforced with twisted rods.

At Woodside, Sinclair and Metz avenues, the streets are carried over the railroad on reinforced concrete arches. The spandrel walls are of the gravity type and the arch ring, which is three centered, is reinforced with steel rods at both the intrados and the extrados. The walls, which have battered backs, are tied to the arch rings with twisted rods. Abutments are provided between the slopes of the excavation. The exposed surfaces are relieved by horizontal scorings and paneled pilasters and the side walls are surmounted by paneled reinforced concrete hand railings.



Location of the New York Connecting Railroad

These three structures are built on gravel foundations, no piling being necessary.

Queens boulevard is the most important thoroughfare crossed by the railroad and is 200 ft. in width. Between curbs the street will be divided into three roadways separated by lines of parking 30 ft. in width. This structure is incomplete at present, but it will consist of three arches of 64-ft. span and 14-ft. 6-in. rise. Here the railroad will be carried over the street. The south abutment is to be carried on Raymond piles while the piers and the north abutment will rest on gravel.

At Jackson and Hayes avenues, the railroad is carried over the streets on deck girder bridges having concrete floors. The floors were poured in four sections and were molded in such a manner that the drainage is toward the center and the water is carried off through 6-in. deep holes placed about 3 ft. center to center. The floors are waterproofed with two coats of asphalt and one ply of tar paper, protected from the stone ballast by concrete. Both bridges are founded

on Raymond concrete piles. At the intersection of Polk and Broadway, the railroad is carried under the street in a subway which consists of an invert or floor and two side walls of reinforced concrete with a roof of 24-in. I-beams, spaced 2 ft. 6 in. apart. At present the subway is built to accommodate only two tracks but is constructed in such a manner that two additional tracks may be placed on the west by removing the short wing walls. The invert and the east side wall are 3 ft. 6 in. thick, but the present west side wall



The Settlement Through Juniper Swamp

is only 2 ft. 6 in. thick and is so placed as to form the middle wall between the two pairs of tracks on the completion of the four-track line.

The subway is reinforced below the roof with steel rods and with wire mesh over the tops of the roof beams where a 5-in. concrete roof is formed by placing concrete between the I-beams. This roof is thoroughly waterproofed and extends 2 in. above the upper flanges of the I-beams. It conforms with the roadbed section of the highway and forms the base of its paving. The spaces between the I-beams



The South Portal of the Tunnel Through the Cemetery

under the roof will be utilized for such pipes and ducts as it is necessary to carry across the subway. The hand railings will be of reinforced concrete, relieved with paneling and rubbed to a finished surface. Wing walls will be provided at the portals, the faces of which will be relieved by horizontal scorings.

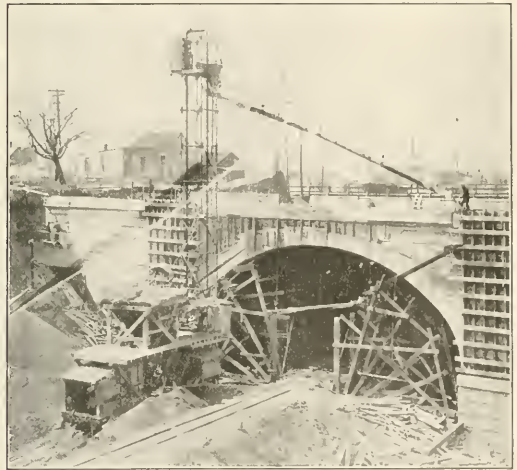
At several other streets this same type of construction will be followed and where the subways are long enough to warrant them, refuge niches will be provided about 30 ft. apart. The drainage is effected by a channel 4 in. deep in the in-

vert, covered with perforated steel plates which support the ballast.

The subway that carries Roosevelt avenue over the tracks is also of the same type, but the construction was complicated by the presence of the Astoria, Woodside and Corona elevated line. It was necessary to support the elevated structure during the construction of the railroad and to provide foundations for the steel supports below the level of the tracks. While the foundations of the elevated structure are in the same general line as those carrying the highway, they are in no way connected. To provide sufficient bearing surface these foundations were spread. The structural steel supports of the elevated are carried up through the highway floor in such a manner that there is no contact, the two structures being entirely independent of each other.

THE SECTION SOUTH OF JUNIPER SWAMP

That portion of the line south of Juniper swamp, about one mile in length, is being constructed by P. McManus, Inc., Philadelphia, Pa. The earthwork on this section amounted to 153,000 cu. yd. One of the interesting fea-



The Concreting Plant at Woodside Avenue

tures here is the tunnel and the walled cut now under construction through the Lutheran cemetery. The tunnel extends northward from Metropolitan avenue for a distance of 516 ft. where it joins the walled cut section that extends 650 ft. further northward, terminating at the bridge under Juniper avenue.

The tunnel which is rectangular in section with an invert, sidewalls and roof of reinforced concrete, is being constructed by the cut-and-cover method. A trench is first excavated on both sides in which the sidewalls and a part of the invert are built. The roof is next built, after which the excavation is completed and the remaining part of the invert or floor finished. Because of the narrow width of the trenches this method renders the bracing of the sheeting less difficult and the earth remaining between the sidewalls affords support for the forms of the roof.

The construction of the tunnel was complicated by the necessity of supporting Metropolitan avenue which is an important thoroughfare. The street traffic, including two street car tracks, is supported by eight steel girders that span the excavation. The road surfaces and sidewalks were formed by planking resting on these girders. As a further complication, it was necessary to support one side of a two-

story frame residence. During the excavation this support was accomplished by means of beams resting on bents placed parallel with the house. After the trench was formed vertical posts were inserted that rested on the sheeting. This left the way clear to place part of the invert and the sidewalk beneath the house. As the concrete set, vertical timbers resting on the invert were placed as supports and the first timbers used were removed. The roof of the tunnel was then formed around these vertical timbers and as they are removed the apertures are filled with concrete.

While at present the tunnel is built to accommodate only two tracks, the same general scheme for future extension is followed as was described above. The present west side wall is so placed as to form the middle wall on the completion of the four-track line. Ducts for electrical equipment are provided back of the tunnel walls and within the side walls of the cut. Refuge niches are provided every 50 ft. throughout the tunnel. About 20,400 cu. yds. of concrete and 1,855,000 lb. of steel reinforcement is required for the tunnel and the retaining walls in the cut.

At the intersection of the Montauk and Manhattan Beach divisions of the Long Island, the new line is to be carried overhead on a double-track truss bridge having a span of 175 ft. The bridge will rest on concrete abutments already completed. In addition to the structures mentioned there will be a highway bridge under Firth and Marion streets near Juniper swamp, a railroad bridge over Fremont street and a small bridge will cross the open cut in the cemetery. The abutments of the proposed bridge at Juniper avenue are extensions of the sidewalls of the cut through the cemetery.

CONSTRUCTION METHODS

Because of the location of the line it was not practical to bring the materials to the site of the various structures by rail and instead they were transported by barges up Newtown creek and unloaded into motor trucks for delivery to the job.

Where practical, two or more structures were built from the same construction plant. At Woodside, Sinclair and Metz avenues the materials were unloaded from the trucks and shot down inclines at the various streets where shelters

spouted from the elevator to these cars which were then moved to the proper place and dumped on unloading platforms from which spouts radiated to the forms.

The track laying contract has been awarded to P. McManus, Inc., of Philadelphia. The 26 miles of track is being laid with the Pennsylvania standard 125-lb. rail with screw spike construction, six spikes to each tie plate. The spikes are being driven with an Ingersoll-Rand "Little David" air-driven drill equipped with a special clutch and wrench made in one piece and geared for low speed. Two men are required to operate the device which is controlled at the drill by hand. The air is furnished by an Ingersoll-Rand portable gasoline air compressor that has a capacity for driving three of the drills and a wood-boring machine



The Crossing of Jackson Avenue

for preparing the spike holes at the joints where the plates are not used.

In placing the spikes a gang of trackmen work in advance of the drill and place the spikes in the holes of the tie plates by hand. The spikes are then given a turn by a hand wrench just sufficient to hold them in place when the drill is applied. The spike-placing gangs are then followed by the drill men who permanently seat the spikes.

This project is being carried on under the direction of A. C. Shand, chief engineer, and H. C. Booz, assistant chief engineer of the Pennsylvania. C. S. Bissell, principal assistant engineer of the New York Connecting Railroad, southern division, is in charge of all construction.



Crossing Over the Long Island Tracks at the Cemetery

were provided for the cement. The $\frac{3}{4}$ -yd. mixer was placed on a flat car and a track was built between the three streets to permit the moving of the plant. A locomotive crane delivered the materials to the mixer and the concrete was spouted to the forms from an elevator carried on the flat car. At Queens boulevard, where the street passes under the railroad, the materials were unloaded from the motor trucks at the street level. A stiff-leg derrick delivered the material to the mixing platform which was placed at the level of the tracks, near the south abutment. An elevator was provided at the mixer and the concrete for the south abutment was spouted from this elevator to the forms. To place the concrete in the piers and the north abutment, a train of dump cars and a dinky engine were provided. The concrete was

NO "RIGHT TO STRIKE."—As the result of recent labor troubles on the Swedish State Railways, the Government has now laid it down that the state is unable to recognize that railway employees have the "right to strike" under any conditions, as railwaymen stand in a different category from any other class of employed person. The reason for this decision is rather interesting. Until the beginning of this year there had never been a strike on the Swedish State Railways, but two broke out recently owing to the demands of the auxiliary and temporary employees for higher wages. The strikers were not supported by the regular staff, no doubt because if their demands had been granted the temporary employees, whose numbers have largely increased as the result of war conditions, would actually have received higher wages than the permanent staff. The railway administration informed the strikers that their demands could not be granted, as they had received more than one increase since the beginning of the war, and added that no employee who went on strike would be employed again. Eventually the disturbance was quelled, and the administration effected an alteration in the conditions of payment, but firmly adhered to its refusal to re-engage anyone who had actually gone on strike. In laying down the principle that the "right to strike" cannot possibly be accorded to railwaymen, the Swedish Government has made use of an interesting argument. Such a right, it points out in a manifesto, cannot exist unless the employer has the corresponding right to declare a lock-out, and this cannot be exercised by the management of a railway undertaking, since it would result in paralyzing all transport.—*Railway Gazette*, London.

ACTIVITIES OF THE RAILROADS' WAR BOARD

The Railroads' War Board has addressed a plea to public service commissions and all state, county and municipal authorities throughout the United States, urging co-operation with the railroads in a suspension during the period of the war, of "all efforts not designed to help directly in winning the war."

The specific suggestions are embodied in a letter forwarded by Chairman Fairfax Harrison. In the letter Mr. Harrison said:

"The present emergency has imposed upon the railroads a very unusual strain in transporting men, food, coal, munitions and materials in augmented quantity. This burden, while cheerfully undertaken, requires every ounce of energy, every unit of rolling stock, every dollar of capital, every bit of supplies and coal which the railroads can command.

"It is the opinion of this committee that all efforts not designed to help directly in winning the war should be suspended during the period of the war. Indeed, this is obviously the thought of President Wilson in his appeal to the country on April 16, 1917, which included the following statement:

"It is evident to every thinking man that our industries must be made more prolific and more efficient than ever, and that they must be more economically managed and better adapted to the particular requirements of our task than they have been."

"Therefore this committee earnestly recommends that during the war the railroads be required by the public authorities to make improvements and carry out projects involving the expenditure of money and labor only when they are absolutely essential for war purposes or public safety. The prevailing high interest rate on money, the difficulty of raising money in competition with the tax free issues of the government, the excessive cost of supplies and labor, the delay in obtaining material, the possible blockade of traffic and the diversion of labor all contribute to make non-essential construction undesirable during the war.

"The committee considers that the erection of new stations, elimination of grade crossings, are among the non-essential improvements which should be deferred at this time. We respectfully suggest that the basis for consideration of new projects at this time should be the increase in the capacity of the carriers for national service.

"Furthermore, we urge your co-operation in eliminating all passenger service which is merely convenient and not justified by public necessity during the present emergency situation."

The Railroads' War Board has taken further steps to induce shippers and producers to co-operate with the railroads in protecting the coal supply in the Northwest during the coming winter by urging the railroads engaged in the lake carrying coal and ore trade in the Pittsburgh district to induce all coal operators on their lines having contracts to supply coal to the Northwest via the lake ports, to load during the remainder of the season at least 50 per cent of their daily supply of cars for such ports there to be transhipped to the Northwest.

Chairman Fairfax Harrison of the Railroads' War Board, in a message addressed to the railroads in the Pittsburgh district, said:

"Although the railroads have in recent months been handling from 23 to 30 per cent more coal than in the corresponding months of last year, a smaller proportion has been shipped to the lakes than last year, and, in consequence, there is still uncertainty as to whether the Northwest will be supplied with sufficient coal to meet its requirements next winter.

"We deem it now, as we did at the beginning of the Lake season, of the utmost importance that every effort should be

made by the railroads involved to satisfy the requirements of the Northwest for water borne coal.

"On the statistics of performance so far this season, it is apparent that unless efforts are renewed and coal is moved at a greater rate for the remainder of the season than in the past months, the requirements will not be satisfied. At the same time the situation of ore accumulated at the furnaces in the Pittsburgh district for national requirements is involved."

The Commission on Car Service has issued a circular letter to the chief operating officers of the railroads inquiring whether their companies have organized a special department to promote car efficiency. In the letter the commission says that this subject is worthy of such attention that in its opinion a special organization can accomplish much and effect a saving in operating cost that will far exceed the expense of the organization, and at the same time, make many more cars available for the shipping public. "All railroads have depended upon instructions issued from time to time to all employees to bring about the results desired," the circular says, "but most of the division officers and employees have so many duties that they are unable to specialize on the subject of getting the most out of each car. We consider it of sufficient importance to railroads, that some competent officer be designated to follow up the matter of intensive car loading, making it his special duty and given such help as required. A great many railroads have already organized such departments with most gratifying results."

The circular lists the following as a few of the important points to which this department should give special attention:

OUTBOUND

1. Orders for cars must be based only on the daily capacity of the shipper to produce, load, and ship.
2. Placing of cars for loading should be done at a time of the day to save
 - (a) the least delay to cars;
 - (b) to cause minimum delay to shippers loading arrangements.
3. Careful spotting of cars to avoid extra switching and to permit most expeditious loading.
4. Personal supervision over loading of cars to insure their being loaded to full carrying capacity at the same time to minimize the risk of damage to contents.
5. Prompt delivery of instructions to billing agent after car is loaded.
6. Prompt movement of cars from loading track to train yard and then see that cars are forwarded promptly.

INBOUND

7. Prompt marking of cars received for switching to delivery tracks.
8. Prompt and careful placement of cars for unloading.
9. Personal supervision of and prompt unloading of all cars.
10. Prompt removal of cars when unloaded.

GENERAL

11. Reconsignment of cars should be discouraged at all times and every encouragement made to have cars billed direct to final consignee.
12. When reconsignments are unavoidable, insist upon such orders being received at destination before cars arrive in train yard.
13. Arrange some effective system for prompt handling through direct channels of diversions or reconsignment orders to avoid delaying any cars awaiting disposition, which causes so much extra switching.
14. Arrange for the chief operating officer and the head of the intensive car loading department to be furnished a daily check (preferably at 9 a. m.) of all loaded cars held for any reason at terminals or other stations, classified as between shippers and consignees, and by commodities for the following reasons:
 - (a) Disposition not received
 - (b) No way bill
 - (c) Embargoes
 - (d) Accumulations
 - (e) Disputes over charges
 - (f) Car defects
 - (g) Demurrage
 - (h) Other causes.
15. Prompt repairs for loaded cars, making light repairs with minimum switching and have prompt switching to and from repair tracks.

THE ENGLISH CHANNEL TUNNEL.—Arthur Fell, M.P., Chairman of the House of Commons Channel Tunnel Committee, recently wrote to the prime minister asking him to afford an early opportunity for discussing and ascertaining the opinion of the House on the Channel Tunnel question. The request is signed by over 110 members of all parties.

GRAIN CLAIM HEARING

Following an investigation undertaken on its own initiative, the Interstate Commerce Commission conducted hearings on claims for loss and damage to grain shipped in bulk, before H. C. Wilson, attorney-examiner, at Minneapolis, Minn., from July 9 to 14; at Omaha, Neb., from July 16 to 18; and at Chicago from July 18 to 21. At these hearings the commission itself introduced from 25 to 30 exhibits. The Great Northern, the Northern Pacific, the Minneapolis, St. Paul & Sault Ste. Marie, and the Minneapolis & St. Louis presented evidence at Minneapolis, the Union Pacific at Omaha, and the Chicago grain carrying lines at Chicago. Only a few shippers testified and to give the shipping interests time to prepare their case, the hearing was adjourned until September 18 at Chicago.

Various facts were brought out in the record which indicate the necessity for investigation. Wide disparities were shown between weights taken at country points and at terminals, indicating that losses in grain are a question of scales as well as of defective cars. Other evidence pointing to the same conclusion showed that some loading points were constant sources of claims, whereas adjacent points on the same line rarely claimed loss or damage to their grain. The Minneapolis & St. Louis testified that it had placed 500 new cars with inside lining into grain service as an experiment, and found that more claims resulted than from the use of old or defective equipment.

Among the factors contributing to the origin of claims at country loading points are the various methods of weighing, which are rarely under the supervision of a disinterested party. Track scales are available only at the larger points. Other shippers are required to depend upon automatic, hopper or wagon scales, and in some instances, on estimated weights. The testimony seemed to indicate that the automatic and wagon scales are not sufficiently accurate to be dependable and a large number of roads refuse to consider claims on the basis of estimated weights.

Scale tolerance and natural shrinkage were also urged as proper considerations in settling claims. The states of Missouri, Kansas and Minnesota recognize natural shrinkage and provide for it by statute. The Chicago, Rock Island & Pacific has a tariff which provides for the deduction of $\frac{1}{8}$ of one per cent in the weight of wheat and $\frac{1}{4}$ of one per cent in the weight of corn for shrinkage, and this tariff has been recognized as reasonable by the Interstate Commerce Commission. The United States Bureau of Standards also has placed its stamp of approval on shrinkage as a proper consideration in weighing grain. It was urged by some that scale tolerance should be allowed for in settling claims. It was brought out that a tolerance of $\frac{1}{2}$ lb. per thousand is permitted in some sections to allow for variations in the register of scales.

The question was raised whether it was proper for freight claim agents to report to the traffic department. Competitive considerations, it was suggested, are apt to cause a freight claim officer under traffic jurisdiction to be more liberal in recognizing claims than he would be if in the operating department.

The hearing seemed to indicate that disinterested supervision of weights at country points is highly essential. The Rock Island recommended the plan it uses in Oklahoma as a means of achieving this end. For some time it has had an agreement with the Oklahoma Grain Dealers' Association, under the terms of which inspectors in the employ of the road examine the scales of the shippers periodically at a charge of \$5 for each inspection. The Rock Island also keeps very close records of grain shipments on all of its lines. The shipper is asked to fill out a certificate stating how many pounds of grain he loads, on what kind of a scale it is weighed, how it is loaded, the condition of the car, etc. On the same certificate the forwarding agent re-

cords the name of the shipper, the name of the consignee, the destination, the car initials, the car number, the name of the loading elevator, the number of the seal, and the condition of the car after loading. In addition, an in-transit record is kept by trainmen which states in detail whether leakage is discovered and where, when and why grain is transferred from one car to another, the track scale weight before and after such a removal, whether car seals are broken at any point and why, and the number of the new seal including the name of the employee applying it. On this same form, which accompanies all waybills, the destination agent records the condition of the car as received and other essential information. These records are sent to the office of the general superintendent of freight claims, and if any claims are subsequently made on cars with a clear record, they are not considered. Knowledge of the existence of these detailed records has had a wholesome effect on the shippers, which has been reflected in large reductions in claim payments per car in recent years. In the fiscal year 1915, the average claim payment per car was \$1.54, in 1916 it was \$1.16 and in first seven months of 1917 it was only 61 cents.

COLLISION IN THE GLASGOW SUBWAY

The British Board of Trade has issued the report of Col. J. W. Pringle, on a rear collision which occurred April 26, on the Glasgow subway railroad, which did slight damage but which was of interest because of peculiar circumstances.

This subway encircles the city of Glasgow, Scotland, and traction is by cable, at 12 miles an hour. The cars are lighted by electricity, current being taken from a roadside conductor by means of skids attached to the cars. The block signaling is controlled manual, without any track circuit control. By means of treadles each signal goes to the stop position behind a train and can be cleared only after the train actuates another treadle at the station in advance.

In this case the leading train, consisting of two cars, was stopped because of an accident to its skid, causing the electric lights to fail. Station-mistress Webster, finding herself unable to clear the signal at the entrance of the block, for the following train, assumed that the electrical apparatus was out of order; and she proceeded to ask for a clear signal by telephone; but the operator at the other end, Station master Fulton, did not give a concise and definite refusal and she took his answer to be affirmative; and so she cleared the signal and the second train was admitted to the block section and ran into the first one, which had been delayed by difficulty in starting, because of trouble with the grip.

The inspector blames both operators; the one at Station A for using colloquial terms instead of the phrases prescribed by the rules, and the one at Station B (Fulton) for giving a reply, when, according to his own testimony, he did not distinctly hear the message.

Driver Gibson, in charge of the leading train, a lad of 17 years, allowed his train to stand in the tunnel without a tail light. He had had two months' experience as a gripman and 11 months' experience as conductor. There were no hand lamps on the cars, for use in emergencies. The electric headlights and tail lights had gone out and the oil headlight was also dead; so Gibson gave the conductor the remaining oil tail light, to enable him to walk forward to the next station. Gibson had intended immediately to restore the electric tail light by getting current through the skids on the rear car, but the collision happened before he could complete the necessary connections.

The inspector finds that failures of the treadles occur rather often, the cause, usually, being the low speed of the train; and these irregularities are not properly reported and attended to. These frequent failures have caused station masters to lose confidence in the signal apparatus, and to have too hasty recourse to the use of the telephone, which is not a suitable method of working high frequency traffic.

Rolling Stock and Machinery Valuation

Suggestions for the Benefit of the Mechanical Department Forces in Handling the Federal Valuation Work

By W. R. Maurer

Mechanical Engineer, New York, New Haven & Hartford

ON March 1, 1913, the "Act to Regulate Commerce" was amended requiring the Interstate Commerce Commission, "to ascertain and report in detail as to each piece of property owned or used by a common carrier, the original cost to date, the cost of reproduction new, the cost of reproduction new less depreciation, and an analysis of the methods by which the several costs are obtained."

In carrying out these instructions the Interstate Commerce Commission segregated the work issuing "orders" covering the various subdivisions. Valuation Order No. 8, issued November 21, 1914, stipulates that every steam carrier subject to the act, shall prepare statements in duplicate covering the carriers' equipment and machinery owned or used, giving in the "Register of Equipment" a description of the property in such detail as to enable one to get sufficient information to identify and price it, and in the "Report of Original Cost to Date" not only the first cost but all other elements of cost entering into the final cost of a unit in place.

The accounts covered and the forms to be used for each are as follows:

Account	Register Form No.	Original Cost No.
37 Roadway Machines	70	71
44 Shop Machinery	72	73
45 Power Plant Machinery	74	75
46 Power Substation Apparatus	76	77
51 Steam Locomotives	78	79
52 Other Locomotives	80	81
53 Freight Train Cars	82	83
54 Passenger Train Cars	84-85	86
55 Motor Equipment of Cars	87	88
56 Floating Equipment	89	90
57 Work Equipment	91	92
58 Miscellaneous Equipment	93	94
Memorandum of Additions and Betterments	95	..
Detail Supporting Statement of Original Cost to Date .....	..	96

The forms are now printed and can be obtained from the General Secretary of the Presidents' Conference Committee of Federal Valuation of Railroads in the United States, with offices at Philadelphia.

The registers are lists of machinery and rolling stock without prices. They are to be prepared by the carrier, being supervised and checked by the mechanical and electrical sections of the Division of Valuation. The original cost to date schedules are to be taken primarily from the carriers accounting records and are to be verified by the accounting section of the government, which has full charge of this portion of the work. The mechanical men should prepare the registers while the accounting forces should compile the cost returns; the latter department will require help from the mechanical department as described later.

One of the first requisites is an efficient organization. The officer having charge of collecting the data for the register should be thoroughly familiar with the equipment; if, however, he is not, then those next in authority must. If the carriers' records are complete, the clerks can readily prepare the registers for steam locomotives, other locomotives, freight train cars, passenger train cars, floating equipment and possibly roadway machines, but no attempt should be made to compile from office records the registers for the other accounts as much information will overlooked.

It is to be remembered that the registers are to be filed in Washington after which the government will send representatives to the carriers' property to verify them, also to collect additional data not called for by these forms. The railroad

company is required to place with each government mechanical and electrical party a representative called "pilot" who is familiar with the property that is to be inventoried and who is to assist in identifying, measuring and ascertaining facts bearing on its age, wear, decay, maintenance and condition. Therefore the carriers' pilots should be experienced equipment men, capable not only of estimating quantities and petty costs, but also of pointing out special conditions affecting the value as well as accurately judging the state of the maintenance.

The first field men required will be those for shop machinery, power plant machinery and power substation apparatus. With each pilot there should be at least one man to assist in collecting preliminary data for the registers. The pilots for locomotives, cars, floating equipment, etc., are not absolutely required until the arrival of the government representatives for these accounts. Before attempting to prepare the data called for by Order No. 8, every one connected with the work should familiarize himself with the latest pamphlets issued by the government entitled "Classification of Investment in Road and Equipment of Steam Roads" and the "Instructions for Field Work of the Mechanical and Electrical Sections of the Division of Valuation, Interstate Commerce Commission" which can be obtained for five cents a copy from the Superintendent of Documents, Government Printing Office, Washington.

As the registers and original cost to date forms are to be typewritten, requiring typewriters with especially long carriages, it has been found desirable to establish a typewriting bureau where not only the equipment registers but all other large work such as reports of Order No. 11, Order No. 12, etc., can be typewritten. A steady flow of work from the various sources will keep the department busy, while if this large work is done by the departments concerned many more large carriage typewriters will be required as well as more operators. The forms sent to the government are to be "carbon backed." Special care is to be taken to see that the carbon paper is of such quality that the backs are not easily damaged and to save time as well as to insure good impressions "double faced" carbons are used to advantage.

Nothing is to be gained by curtailing the data for the equipment register. Although much of it might be recorded at the time of the joint field inspection, the government field men's time is limited. They are being constantly pressed for greater output or mileage. In their haste, important things might be missed resulting in a loss to the carrier. As it is, the second inspection often corrects errors and omissions.

ACCOUNT 37—ROADWAY MACHINES

All roadway machines should be distinctly numbered so that the register can be readily verified by the field party. For all classes of roadway machines in addition to the data called for on D. V. Form 70, wherever it is possible give in the remarks column the division or district on which the machines are located and all data that will enable them to be readily identified. For instance, on portable boilers give the type, height and length, steam pressure, number, diameter and length of tubes, size of firebox, heating surface, kind of grate, fittings, injectors, etc. Ditching machines, which are ordinarily operated while temporarily mounted upon a

flat car, but which are capable of self propulsion on carriers' tracks, should be included in this account.

D. V. Form 313 is to be used for listing small tools with each machine.

ACCOUNT 44—SHOP MACHINERY

Before the carriers' field party starts out to obtain the data for the Shop Machinery Register, special printed or mimeograph forms called "Carriers' Field Sheets" for each class of machinery should be prepared, on which is to be recorded the data collected. This will insure that nothing is overlooked as on each form there should be a place for all of the items called for by the captions of the register, as well as other necessary items. The following will suggest some of the items to be mentioned:

INVENTORY OF SHOP MACHINERY—Account 44.

Date	Inventory No.
Location	Old Shop No.
Name of Bldg.	Mfrs. No.
Mfrs. Name	Size
Kind	Gears, Kind
Drive, Kind	Safety Guards
Equipment	Foundation, Material
Year Purchased	Quantity
Description of Drive	Inventoried by
Remarks	

*Show details of pulleys, belts, countershafts, etc.

The field force send these carriers' field sheets to the office where the necessary data is drawn off. Provided there are no working drawings, the field force should attach sketches showing dimensions and material of all guards and home made attachments. These sketches should be in such detail as will enable a computer to estimate the quantities of the various material used in the construction as well as the cost, provided the actual costs are not available. Home made machines should be treated in a similar manner. These carriers' field sheets are extremely valuable as reference when the government representative is in the field.

Account 44 (with Account 45—Power Plant Machinery) is the most difficult to handle, not only because the data for the register must be collected in the field but also because the line of demarkation between this and the various other accounts is quite obscure. It is frequently found that one line of pipe will have to be allocated to three different accounts such as No. 20—Shops and Engine Houses, No. 32—Power Distribution System, No. 44—Shop Machinery. Another source of confusion is whether to classify engine and boiler room machinery under Account 44 or 45. If this machinery is located in distinct buildings it is to be included in Account 45, but if it is installed in a shop as part of the shop equipment it is to be included in Account 44.

Departments.—Each department or building should be listed separately, identification numbers being assigned to each machine or unit, no two machines on the road to bear the same number. In renumbering the machines sufficient blank numbers should be left between departments to take care of the growth for at least 10 years. Number the various units in a department in logical order so they may be easily checked on the register.

Power Plant.—For the method of handling power plant machinery, Account 44, see Account 45.

It must be borne in mind that power distribution systems of every description, which convey power from the boiler or engine room to any other building or department are not to be listed under Account 44, except the line shafting. All piping in shop buildings supplying power to the shop machines, including the leads from the mains to the machines should be accredited to Account 20. All wiring in shop buildings, including the leads from the mains to a motor starting device, should be accredited to Account 20. The motor starting device itself and the wires between such device and motor are considered a part of the motor and should be accredited to Account 44.

Machines.—Each machine should be described in such

detail as to give a comprehensive idea of it, mentioning all special constructions and attachments that would enhance its value. Give the builders' number, also a description of all special safety appliances and guards not furnished with the machine. Countershafts need not be described unless they are of special design. All separate cranes should be numbered and a complete description given. Cranes which are furnished with and are a part of a machine are not to be numbered but are to be mentioned in the machine description. Give the name plate data of a motor and control equipment of motor-driven machines.

Main and jack shafts should be tabulated by diameters, the total length of each diameter in a department being listed as one item. A description and quantity of shaft couplings should also be given. Prepare a 11 in. by 17 in. drawing showing the various styles of shaft hangers used, typing each style. On the register show the type, drop, length of the box and the bore. List line shaft pulleys in the order of their size; give the width of the face, the material, and state whether they are solid or split. Give the aggregate length of each width of belt and classify it as to ply and material.

Use D. V. Form 313 for small tools. All small tools of the same size and kind should be listed and priced as one item. The lists are to be made in duplicate. A legend should be inserted on last sheet of D. V. Form 72, stating that the list of small tools has been prepared on a separate form. The gathering of the data for small tools is a tremendous task, but can be lightened somewhat by furnishing to each shop and engine house small blank books, two for each foreman or gang boss, in which they are to list the small tools under their care. These to be checked in the field by the shop machinery pilot, particular attention being given to descriptions and omissions. These books to be sent to the office and copied on D. V. Form 313.

Patterns and templates are to be listed on D. V. Form 313. The lists should show the quantity and cost with a description of them. All patterns or templates at one location are to be grouped.

The following are to be included in Account 44; locomotive boiler washout systems including piping and foundations, boiler front racks, pipe racks, ladder racks, apparatus for drying lumber including blowers and motive power for same, trucks, portable benches, also machinery in oil houses.

The following belong to Account 20; heating coils for blower outfits, blower piping for conveying hot air from the blower to the dry kiln, fire fighting apparatus, fixed benches, and oil storage tanks and their piping located outside of buildings.

ACCOUNT 45—POWER PLANT MACHINERY

Note the cautionary remarks given under Account 44 regarding the proper classification of engine and boiler room machinery.

Boilers, engines, etc., located in detached buildings and used for furnishing power, heat or light to stations, or other buildings are to be classified as Power Plant Machinery, Account 45. Each unit in a power plant should bear a distinctive number which will not be confused with similar numbers at other locations. It is suggested that the first units shown in the registers for this account are the boilers and their appurtenances followed by the other boiler room machinery, after which should be listed the machinery in the engine room.

Boilers.—Give a full description of the boilers including the type, steam pressure; number, size and length of tubes; heating surface; size of drums, if any; material of headers, if any, and small fittings. In the remark column should be shown the amount of excavation in cubic yards and the builder's drawing number. Where drawings are not available prepare sketches of the general arrangement in such

detail as to permit calculations of quantities of material used in the settings.

Stokers.—Numbers should be assigned to each stoker and the company's drawing numbers should be given for reference.

Auxiliaries.—The auxiliaries should be listed separately, giving a complete description of them as well as the catalog reference. All condensers and feed water intake lines from a private water supply to the boiler or engine room should be included in Account 45. Condenser and feed water intake lines from city mains should be noted in Account 45 only from the point where the line enters the power plant building. The line between city main and building should be accredited to Account 29.

Piping.—Measure the piping and classify it according to the material, thickness, service, size and kind of joints. List all valves and all fittings that are four inches and over.

Pipe Covering.—Give the lineal feet of each size of pipe covering, as well as the material, thickness, make, etc. If molded coverings for valves and fittings have been used give the catalog reference. If plastic covering has been used, give the kind, thickness, area, etc.

Engines and Turbines.—Give the name of the manufacturer, show the type, whether condensing or non-condensing, vertical or horizontal, steam pressure, revolutions per minute, cylinder dimensions, style of valve gear and governor, size of fly wheel, and if they are part of the generator, so state. If the engine was built with an electric generator on the same base plate by one manufacturer, it should be considered as one unit and full details of both given in the same record.

Electric Generators.—Give the name of the manufacturer, name plate data and distinctive characteristics, including the number of main poles and interpoles.

Wiring.—List all wire in lineal feet, specifying material, size, whether solid or stranded, kind and thickness of insulation and covering. State whether it is run in conduit, on knobs, or cleats, or a pole line. List the conduit in lineal feet, specifying the material, size and number of bends if the conduit is $2\frac{1}{2}$ in. or over in diameter. List condulets, insulators, etc., with catalog references.

Switchboards.—Give each complete switchboard an identification number. Describe each panel separately, indicating its functions, size, material, kind of finish, and supports. List all instruments, switches and other equipment on the front of each panel, noting at the same time all integral parts such as voltmeter resistances which may be in the rear of the panel, giving distinctive characteristics with the name plate data or catalog references. Give similar data for the apparatus on the back of the switchboard without distinguishing between the panels. List all bus bars, brackets, clamps, insulators, etc., with catalog references.

Miscellaneous.—List the transformers, circuit breakers, switches, switch cabinets and similar apparatus, giving the name plate data, or catalog references. For lightning arrester equipment, add the kind of mountings and insulators. Spare apparatus located in power plants, but not in service nor connected for service is unapplied material and is not to be listed on the register.

ACCOUNT 46—POWER SUBSTATION APPARATUS

This account should be reported in the same manner as Account 45.

ACCOUNT 51—STEAM LOCOMOTIVES

"Date Built" is the original date locomotive was built. If a new boiler was applied, the date the boiler was built should be entered in the remark column. Light weight is the weight of both the engine and tender without coal, water, fire or engine crew. If no records exist regarding this item,

then it will be necessary to weigh a sufficient number of engines having various sizes of boilers and fireboxes, also tenders of various capacities in order to establish an amount to be deducted from the weight in working order, which is the weight usually found in office records. In the remark column list the important betterments such as "equipped with superheater, new boiler," etc. If the locomotive was purchased second-hand, it should be indicated in this column, also the date of acquisition. An additional list should be prepared showing the following data at the date of valuation; number, length and size of tubes, and the length and width of firebox.

A list on D. V. Form 313 should be prepared showing the standard tool equipment for locomotives used in the various kinds of service. This list should show quantities and detail prices as well as an aggregate price of the complete equipment. A list is to be kept of all locomotives scrapped after date of valuation so that government party will not be looking for items which are non-existent. The new locomotives placed in service after the valuation was made should also be recorded.

ACCOUNT 52—OTHER LOCOMOTIVES

This classification covers electric and similar locomotives, but not cars with motor equipment. The suggestions for the steam locomotives and motor cars apply to Account 52 also.

ACCOUNT 53—FREIGHT TRAIN CARS

The cars should be reported in "Lots" or "Series," giving the first and last numbers of the series with the number of units in the series. When certain cars have for any cause been removed from revenue service, the actual live car numbers in that series or the individual numbers of the cars removed should be shown. The capacity and weight of the cars should be shown in pounds, and the length shown should be the length over end sills. The width is the width over the car body. The height is that over running boards on house cars, to the top of the sides on open cars and to the top of the floor on flat cars.

In the remark column show the important betterments, such as draft gear, steel underframe, safety appliances, etc. For tool equipment on caboose cars use D. V. Form 313. If the cars were purchased second-hand, indicate the fact in this column together with the date of acquisition. As in the case of locomotives, etc., keep a list of the freight train cars removed from and those added to revenue service after date of valuation.

ACCOUNT 54—PASSENGER TRAIN CARS

Two forms are used for cars under this classification; D. V. Form 84 for motor cars, trailer cars having multiple unit equipment, and for gasoline and gas electric self-propelled cars. D. V. Form 85 is to be used for steam railroad cars and for trailer cars without multiple unit equipments.

The remark column is to be used for amplifying the description of the underframe and superstructure, also for listing the major betterments. If the cars were purchased second-hand, indicate in this column together with the date of acquisition. Use D. V. Form 313 for tool equipments. Keep a list of passenger train cars removed from revenue service after the date of valuation.

ACCOUNT 55—MOTOR EQUIPMENT OF CARS

D. V. Form 87 should be used for multiple unit equipment either on motor or trailer cars. Also for trailer cars equipped with train wires for power or control and for motor equipment of gasoline or gas-electric, self-propelled cars. Form 87 is not to be used for trailer cars not equipped as before described. The motor equipment is to be shown

for each car or series of cars in the same order as is recorded, the equipment of which it is a part.

ACCOUNT 56—FLOATING EQUIPMENT

On D. V. Form 89, after "Station," give the port of registration. List floating equipment in alphabetical order according to its classification or kind. In the remark column give material of hull. Use form D. V. 313 for tools or other appurtenances.

ACCOUNT 57—WORK EQUIPMENT

Use D. V. Form 91 for rail work equipment and D. V. Form 89 for floating work equipment with the title amended to read Account 57—"Floating Work Equipment." All work equipment should be distinctly numbered so that the register can be readily verified by the field parties. The various types of work equipment should be entered on the register in the same manner as the corresponding revenue equipment covered by Accounts 51 to 56 inclusive. The listing of machinery should follow that for Accounts 37, 44 and 45. If units of work equipment were converted from those of other accounts, the date of transfer and from what it was converted should be shown in the remark column. Electrical motor equipment on cars used in work service belongs in Account 55, while the car bodies and trucks are to be accredited to Account 57. Use D. V. Form 313 for small tools and appurtenances.

ACCOUNT 58—MISCELLANEOUS EQUIPMENT

In this account belong horses, harness, wagons, auto trucks, etc. In describing horses give the height, weight, etc.; of automobiles give the make, age and such other data as will enable one to get a clear understanding of the unit listed.

GENERAL

Upon the arrival of the Government mechanical and electrical field forces, a definite understanding should be reached as to the methods to be followed in checking the carriers' registers and collecting the additional data required for the government field sheets. The carriers' pilots should be instructed to agree upon the record of condition and maintenance, which is to be recorded on the field sheets as "Normal" (N), "Above Normal" (A. N.), or "Below Normal" (B. N.), provided the field sheets show the facts upon which the conclusions were based; but if the pilots should not agree as to "Probable Service Life" nor "Service Condition Percent" both the original and duplicate should be stamped over "Service Condition Percent" to the effect that railroad representative does not agree as to methods or conclusions to enable the carriers' pilot to sign the field sheets.

When actual costs of home-made machinery or accessories are unknown, the carrier's pilot should be instructed to agree, if possible, with the government's representative upon their estimated cost, due allowance being made for material, labor and overhead charges. These costs will then be entered upon the government's field sheets and are final.

Many of the accounts are provided with a special form of field sheet, each adapted to its particular purpose, upon which is printed a list of the more important details of construction, with blank spaces opposite, in which is to be noted the various items which do or do not appear on the unit being inspected and each carrier should determine whether or not the printed list fully covers his equipment. If it does not, then such other items should be added as will give not only a comprehensive idea of the unit, but also cover the principal additions and betterments to be claimed.

ORIGINAL COST TO DATE

In appraising property usually one of two methods is employed as a basis: (a) "Original Cost to Date," being a

summation of all the costs of a unit in place, from purchase to time of appraisal; (b) "Cost of Reproduction New," being the cost based on present prices. The latter method provides for the inclusion of every element of cost and the basis upon which substantially all modern appraisements are made.

The act stipulates that the Interstate Commerce Commission is to ascertain the "Original Cost to Date" and the "Cost of Reproduction New." In turn the Commission asks the carriers to furnish statements showing the Original Cost to Date.

On the older lines, the accounts of many of the constituent roads have been lost or are incomplete. Many conservative paying companies often charged all minor improvements, and at times large ones, to operation. Then, too, the question of additions and betterments is not thoroughly understood by the shops, which are really responsible for addition and betterment costs being properly allocated.

Not one foreman in a dozen appreciates that when a ladder with stiles is substituted for one made of bent hand holds, or a 10-in. brake cylinder replaces an 8-in. one, or a compound pump takes the place of a simple one, that part of the cost of substitution is chargeable to betterments and should be reported. Therefore the accounting records probably do not reflect the true "Cost to Date," which is the only method of appraisal of equipment and machinery to which the carrier is a party.

If the accountants' books do not contain all the costs it behooves the carrier to see that careful estimates are made covering the omissions. It might be well to review the additions and betterments shown in the records to see if they are correct. The mechanical branch is best fitted to make this study. The construction at date of valuation of each engine, car, etc., should be compared with the original detail specifications and the difference noted. These differences constitute some of the additions or betterments for that unit.

Additions are *additional* facilities or devices such as air brakes applied to cars not previously equipped (all labor used in construction and application should be charged).

Betterments are *improvements* of existing facilities such as substitution of steel tired wheels for cast iron wheels. The cost chargeable to the accounts is the excess cost of the new parts over the cost of parts retired. The difference between the labor cost of applying old parts and applying new should be included but not the cost of removing old parts. All prices used should be those current at the time the addition or betterment was made.

For each addition or betterment prepare on 8½ in. by 11 in. sheets a comparative statement showing in parallel columns the costs of the "original" and "final" constructions, giving the quantities, unit prices and costs of both material and labor. To the cost add allowances for overhead charges. The difference between the totals of the two sides is the betterment. It is obvious that if there were no "Original Construction" then the change is an addition, which permits the charging of labor of application. Show the date of the prices, the date the estimate was made and the name of the estimator. From a file of these sheets not only the total additions or betterments applied to any unit may be readily ascertained, but also the correctness of the claim can be verified.

In filling out the original cost to date forms, the units should be reported in the same order as on the registers. The costs to be reported are those contained in the carrier's accounting records. Should these be missing or incomplete, other records or even estimates should be used, indicating the source, name and title of estimator, etc.

Great care should be exercised to see that the costs taken from the accounting records are for the identical units reported in the register as it is sometimes found that a car

or locomotive has been renumbered or replaces another of the same number.

There is quite a diversity of opinion regarding the use of Forms D. V. 95 and D. V. 96. It is suggested that the district accountant be consulted as to the method he desires to be followed in reporting additions and betterments as well as supporting data.

WASHINGTON CORRESPONDENCE

WASHINGTON, D. C., July 24, 1917.

CONSERVATION OF TRANSPORTATION

The Council of National Defense and the various departments of the government are giving a great deal of attention to the transportation problem in connection with the handling of war supplies and are not only co-operating with the railways in many ways to promote the most efficient use of the available facilities, but are also trying to do what they can toward arousing the public to an appreciation of the situation.

The government is extending very effective co-operation in the campaign inaugurated by the Railroads' War Board to utilize the full carrying capacity of equipment. The recommendations which have been sent to shippers on this point by the Interstate Commerce Commission, the Department of Commerce and the Department of Agriculture have already been noted in the *Railway Age Gazette*. The Commission on Car Service has also recently taken this matter up with the Army and Navy and other departments that are ordering vast quantities of munitions and supplies of all kinds, requesting them in placing contracts to specify in the order that cars shall be loaded to full capacity. Very satisfactory replies have been received from the heads of various departments, stating that they have issued orders that the request shall be complied with. Both the Army and Navy and the Shipping Board have issued such orders. The Traffic Executive, located in New York, which handles shipments of supplies for the Allies, is also making it a point to see that its shipments are loaded in full cars and the inspection department of the British Ministry of Munitions of War in the United States has issued a circular to its agents, saying: "The first essential condition is that all cars be loaded to 10 per cent above their nominal capacity and all other conditions must be made subservient to this."

The storage committee of the general munitions board of the Council of National Defense has authorized a statement, saying that the government and every other purchaser of goods must make every effort to buy near the point of utilization so as to make the one necessary railroad haul as short as possible. A number of instances have come to the attention of the storage committee where articles are being manufactured in the East with orders to ship West while the same articles are being made in the West for shipment to the East. This lack of co-operation between buyer, railroad, shipper and consignee, it says, must cease.

As a good example of what grows out of a full understanding, the statement cites the pooling arrangement effected between coal operators, railroads, mines and lake vessels, whereby coal from Lake Erie ports destined for the head of the lakes will be classified and handled so much more efficiently that the equivalent of 53,000 cars will be added to the railway equipment. Some similar co-operative methods will be developed within the next few months to control all government shipments. "It is unthinkable," the committee asserts, "that the present hit-or-miss method should be allowed to continue. Of course, in all shipments, especially of government supplies, nothing less than car lots can be considered satisfactory. There is no way by which the railroad can give preference to, or expedite, a less than a carload lot shipment. Every possible effort must be made to combine

the shipments of different manufacturers, if need be, into full car lots.

"Most industrial establishments are situated so that to make any considerable addition to their storage areas is impossible. At most manufacturing centers, therefore, it will be desirable to create assembly stations for the collection of government freight. Such stations will permit the combination of a number of small shipments into car lots. The accumulation of freight at such local centers will give to the railroad a less fluctuating load, and will make possible the routing each day of a more or less constant number of cars to the several destination points. Thus the freight service will be regularized as is the passenger service, and permit of a more efficient use of rolling stock.

"More and more the motor truck must be used for local deliveries of freight, not only between the plant and freight assembly station, but to consumers at relatively nearby points. This will mean, in many instances, the organization of a joint motor car service by the manufacturers of a given district, to insure that as nearly as possible full motor truck loads may be available for each trip. This motor service will not be in many cases the cheapest method, but motor trucks will probably provide the only means of regularizing the transportation service."

THE STORAGE PROBLEM

The storage committee states that expenditures in excess of \$50,000,000 for terminal storage areas at or near the seaboard will undoubtedly be necessary and that not a moment should be lost in providing these facilities. The equipment which it is necessary to provide for each soldier going overseas amounts to about five and a half tons. This storage load will be put upon the nation before the end of the year and to handle it will require carefully designed and equipped areas, probably 2,000 acres in extent.

The storage policy will provide for four types of storage areas, the term "area" being used as including (1) open spaces such as are required for lumber and the like, (2) partially enclosed spaces such as are used for hay, etc., and (3) fully enclosed spaces, such as warehouses. The types of these storage areas will be (1) at the individual manufacturing plant, (2) at points of assembly within a given manufacturing district to which goods can be hauled by automobile truck or wagon, (3) at points of utilization and of consumption, as at the cantonment or training camp, and (4) at places adjacent to terminal ports and from which goods will be transported to ship by motor truck or lighter.

Dependence must be placed very largely upon local initiative for the provision of ample storage at the point of manufacture, the committee said. Manufacturers making goods for the government, and in fact all manufacturers, no matter what their product or for whom it is made, should be encouraged to expand their storage capacity at once in every possible way.

"We cannot continue to allow manufacturers to dump their products as completed on the railroads without regard to the necessities of the situation," said the committee. "This means more storage for manufactured articles. As the load on the railroads increases, the regularity of deliveries on individual shipments will be interfered with, and if continuity of manufacturing is to be maintained, our manufacturers will have to carry larger stocks of raw material, which will require additional storage."

AVOID TRANSPORTATION WASTE

The general munitions board of the Council of National Defense has also issued a statement calling attention to the importance of conserving railroad facilities.

"The railroad situation is right now the weakest link in the storage problem," according to the board. "Unless we begin at once to take steps to safeguard the railroad situation, by

January 1, 1918, we will have no storage problem, because there will be nothing to store. On account of the car shortage, manufacturers will be unable to secure raw materials or ship their finished products. These facts explain why the railroad factor is strongly emphasized in our statements of policy. A railroad can stagger along for a time under a load far heavier than it is designed to bear. But if this goes too far, signs of congestion begin to appear. And then, if nothing radical is done, an actual tie-up ensues."

The level of efficiency would be reached, the board pointed out, if it could be arranged that each of the myriad articles being purchased by the government for the Army and Navy could be handled once, and only once, by the railroads. To bring this about, nothing should be put into a railroad car except for immediate and direct haul either, first, to a place where it is to be consumed or otherwise utilized, or second, to the seaboard prior to transshipment across seas.

It is quite common military and industrial practice for most munitions to make three, four or more railroad trips before they reach the consumer or the hold of an ocean going ship. Sometimes goods are sent to intermediate distribution points, or to places of assembly, requiring additional, and frequently, unnecessary haul. Sometimes these extra haulings are simply the result of accident or chance. But every extra and avoidable hauling, even where mileage is not increased, will have to be cut out if the railroads are to be an efficient part of our war machine.

"There are some railroad lines in England today, whose entire equipment is being used for army purposes six days out of seven," the statement said. "We may be in a similar situation in this country before the spring of 1918. Unless we rigorously and scientifically conserve railroad facilities, industry's participation in their use will be very meager. We cannot waste and win the war."

POOLING OF COAL SHIPMENTS

On the St. George piers, on Staten Island, New York City, a program to pool all export coal and much of that delivered for the city's consumption was inaugurated on July 23, according to an announcement made by the Tidewater Coal Exchange, which is working in co-operation with the Railroads' War Board and the coal production committee of the Council of National Defense. The St. George piers constitute the shipping terminus of the Baltimore & Ohio and Staten Island railroads.

On August 1, it was said, other piers supplying much of the coal for New York City consumption and for shipment by water from that port, also will put into effect the program for tidewater pooling, in order to hasten boat shipments to New England and other destinations and to release cars as rapidly as possible for other uses. These piers are South Amboy, Port Reading, Elizabeth and Port Liberty.

The Philadelphia piers, on which pooling of coal will take place beginning August 1, are the Port Richmond, Greenwich and Jackson Street piers. The Hampton Roads piers are Lambert's Point, Sewell's Point and Newport News. The Baltimore piers, where pooling likewise will become effective on August 1, are the Canton piers. The program already is in effect on the Baltimore & Ohio and Western Maryland piers, and is said to be working successfully.

In each of these instances coal of like kinds will be run on particular tracks, and each shipper will keep a credit and debit balance with the deputy commissioner of the Tidewater Coal Exchange at each port. Vessels or barges, arriving at port to take on a load of No. 1 coal, for instance, will not have to wait while a particular consignment is extricated from a crowded switchyard, but will take the first cars on No. 1 track.

The total amount of coal likely to be shipped from the four tidewater ports where pooling is to be put into effect—New York, Baltimore, Philadelphia and Hampton Roads—

will amount to 35,000,000 tons. The usefulness of vessels and cars will be greatly augmented thereby.

ORGANIZATION FOR EFFICIENCY ON THE CHICAGO & NORTH WESTERN

The Chicago & North Western has in effect a plan of organization for efficiency which extends from the executive offices to each division of the road. Every second Friday a staff meeting is held in the office of the vice-president of operation at Chicago which is attended by officers of all other departments. Here any matter is discussed which is pertinent to greater economy or efficiency of operation. Similarly, divisional staff meetings are held every Saturday which are called by division superintendents and attended by the division officers, including the division engineer, the trainmaster, dispatchers, roadmasters, master mechanics, etc. The results of these are reported by the superintendents to the general office. In addition, divisional efficiency committees were recently organized, consisting of the division superintendent and the ranking members of the traffic and mechanical departments on each division. Some of the special problems which these committees are required to consider are, maximum carloading, heavier train loads, and the elimination of empty car mileage. These committees meet semi-monthly and report directly to the vice-president in charge of operation.

Although the divisional staff meetings have been taking place for the last two or three years, a special interest has been taken in them recently in view of the critical transportation situation. Typical of the character of these meetings is one recently held at Sioux City, Iowa. Among the subjects discussed were the feasibility of pooling locomotives, increase in prices of materials and equipment, and the possibility, of further economy in the use of materials by all departments.

Among those who spoke at this gathering was Mr. Simmons, a brakeman, who said in part: "There are two ways to get ahead in this world, either increase your income or decrease your expenditures; either accomplishes the same result. Has it ever occurred to you, with the cost of material advancing more than 60 per cent., with the price of coal advancing 30 and 40 per cent., with the cost of gondola cars advancing 110 per cent., and the locomotives we are now using more than double what they were in 1915, that the only thing the North Western has to sell is transportation? With the tremendous advances in the cost of all prices of labor this company is receiving the same price for hauling a carload of hogs from Sioux City to Chicago that it received in 1915, and while the railroad is asking for adequate increases in freight rates, until it receives them it must look to its employees to help meet these increases. By practicing the same methods of economy with the company's material and supplies as we do in our homes (if the price of an article has advanced beyond its worth to try and get along without it or to use just as little of the article as possible) much can be done to meet the situation."

L. Gilbert, roadmaster at Sioux City, stated that in 1913 it cost his subdivision \$390 to relay one mile of track and that in 1916 it cost \$495, or an increase of \$105. Ballast cost \$806 per mile in 1914 and \$1,774 in 1916, or an increase of \$968.

F. H. Lowery, engineer, said that in March, 1917, the total engine mileage on the Sioux City division was 138,000. Had every fireman on the division saved but a single scoopful of coal in each 100 miles fired he would have saved the company more than 12½ tons, computing each scoop as 18 lb. The remarks made by the others who attended the meeting were of a similar character and indicated that officers and employees of the North Western are keenly alive to the pressing necessity for economy and the available means of achieving it.

Decision In Transcontinental Rate Case

Commission Finds Water Competition Temporarily Negligible and Orders Readjustment Until War Is Over

THE Interstate Commerce Commission on July 24 rendered its decision in the various cases involving transcontinental freight rates, in which the commission finds that existing water competition is a negligible factor in affecting the rates by rail between Atlantic and Pacific coast terminals. Rates on commodities from eastern defined territories to Pacific coast terminals lower than the rates on like traffic to intermediate points are found not justified under existing circumstances. The present effective rates on certain specific commodities from all eastern defined territories to Pacific coast terminals are found to be not unreasonably low and not to have been induced by water competition. The present effective rates on other commodities in schedules B and C are found, as a whole, unreasonably low from territories east of the Missouri River to Pacific coast terminals. The rates on barley, beans, canned goods, asphaltum, dried fruits and wine from Pacific coast ports via rail-and-water routes through Galveston to the Atlantic seaboard should be revised to accord with the requirements of the long-and-short-haul clause of the fourth section. The commission's report will be found in 46 I. C. C. 238. A brief abstract follows:

ABSTRACT OF THE COMMISSION'S DECISION

In Reopening Fourth Section Applications, 40 I. C. C., 35, we found that the existing competition by water at the time the report was made, June 5, 1916, between the Atlantic and Pacific coasts, did not justify the relationship of rates then existing. We also found that the maintenance of these low rates on the schedule C commodities named in Commodity Rates to Pacific Coast Terminals, 32 I. C. C., 611, and the maintenance of the rates on barley, beans, canned goods, asphaltum, dried fruits, and wine from California ports, via rail and water, to the Atlantic seaboard, while higher rates were maintained to or from intermediate points, had the effect of unduly preferring the coast points and unduly prejudicing intermediate points. Orders were entered requiring the carriers, on or before September 1, 1916, to readjust the rates on the schedule C commodities in accordance with the terms of our order respecting schedule B commodities. The relief orders which had been issued respecting the rates on barley, beans, canned goods, asphaltum, dried fruits, and wine were rescinded, effective September 1, 1916.

Pursuant to these orders, new tariffs were filed, effective September 1, 1916, containing rates purporting to be in accordance with the requirements. The new tariffs contained many increases in the rates to the Pacific coast on the schedule C items, and in the rates on the California products from California ports to the Atlantic seaboard. Protests were filed with the commission on behalf of a large number of shippers and receivers, representing many localities east of the Missouri River, and on or near the Pacific coast. It was strongly urged that the marked increases would be destructive of certain industries, and would result in material losses on account of unfulfilled contracts, and that some of the new rates were unjust and unreasonable in and of themselves. The commission thereupon suspended the new rates until December 30, 1916.

On September 9, 1916, the Merchants' Association of Spokane, Wash., filed a petition, alleging that there was not at that time and had not been since April 5, 1916, any water competition whatever between the Atlantic and the Pacific coasts of the United States, and that there existed no justification for the maintenance of lower rates from eastern

defined territories to the Pacific coast than to intermediate points.

On October 17, 1916, by appropriate order, we reopened all of the fourth section applications relating to the rates on commodities from eastern defined territories to Pacific coast ports and intermediate points, and all of the applications respecting rates on barley, beans, canned goods, asphaltum, dried fruits, and wine from California ports to Atlantic ports.

Prior to the hearings the carriers sought and obtained authority to cancel the suspended tariffs and to publish new tariffs containing more moderate increases to and from Pacific coast points. These new tariffs were filed to become effective December 30, 1916, on statutory notice and had the effect of increasing the rates on all the schedule C items from nearly all eastern defined territories to the Pacific coast ports by 10 cents in carloads and 25 cents in less than carloads. No increases were made in the rates to intermediate points in any instance in which the resulting rate would be higher than the rate to the Pacific coast ports. The new tariffs also had the effect of increasing by 10 cents the carload rates on barley, beans, canned goods, asphaltum, dried fruits, and wine from California ports via rail-and-water routes through Galveston to the Atlantic ports, and also of increasing the all-rail rate on canned goods from California points to eastern defined territories from 62½ cents to 72½ cents. The effective date of some of the eastbound rates was subsequently postponed by the carriers until March 1, 1917.

THE SITUATION AS TO WATER COMPETITION

The following figures respecting the ships and tonnage moving via the Panama Canal between the Atlantic and Pacific coasts are said to have been taken from the Canal Record:

	Westbound		Eastbound	
	No. of ships	Tonnage	No. of ships	Tonnage
August 14, 1914, to June 30, 1915.	172	951,044	163	895,614
June 30, 1915, to June 30, 1916,	52	227,103	41	217,285
June 30, 1916, to November 1, 1916,	8	26,223	10	12,935

The evidence showed that two Pacific Coast Steamship Company steamers sailed from San Francisco for Atlantic ports during the latter part of August, 1916: that two American-Hawaiian steamers passed through the canal with east-bound cargoes in recent months, and that two steamers sailed from New York for the Pacific coast in July and one in October, 1916. One steamer reached Charleston, S. C., in September, 1916, carrying 17,000 barrels of flour from north Pacific coast points. There are statements in the record of other sailings and expected sailings, but the table of tonnage moved from June 30 to November 1, 1916, shows that this movement is slight and the evidence indicates that the movement has been irregular and uncertain.

A statement offered in evidence on behalf of Pacific coast cities, compiled from data gathered from marine engineering publications, purported to show that on October 2, 1916, there were building in the various shipbuilding plants of the United States a gross tonnage of vessels of all descriptions approximating 1,600,000 tons. An extract from the consular and trade reports on November 18, 1916, showed steel merchant vessels, building or under contract in American shipyards on November 1, 1916, according to shipbuilders' returns to the Bureau of Navigation, Department of Commerce of the United States, numbering 417 vessels,

of 1,479,946 gross tons. During October, 1916, American shipyards are said to have finished 17 steel merchant vessels of 52,941 gross tons and made new contracts for 17 steel merchant vessels of 77,877 gross tons. It is stated that there were under contract in American shipyards on November 1, 1916, 314 merchant vessels of 960,899 gross tons, which the builders of these vessels expected to launch on or before June 30, 1917.

It is clear, however, that the present service by water between the two coasts of the United States is infrequent, sporadic, and irregular. It is inferable that the great ship-building program now being carried forward in the ship-building plants of the United States will result in bringing into this coast to coast trade a number of ships in the not distant future. Testimony on behalf of the merchants on the Pacific coast showed their disposition and capacity to organize and equip steamship lines for this business in the event of radical increases in the rail rates between the two coasts.

The present situation, however, as to the water competition, is beyond dispute. There is no existing competitive necessity by reason of water service between the two coasts which warrants the rail carriers in maintaining under present circumstances lower rates to the Pacific coast than are normal and reasonable or lower than to intermediate points.

ATTITUDE OF THE RAIL CARRIERS

The rail carriers are before us in this proceeding seeking authority to continue lower rates on a large proportion of all commodities to the Pacific coast than to intermediate points and lower rates from the Pacific coast via rail-and-water routes through Galveston on a limited list of commodities than are applied from or to intermediate points. It is urged that the ability of the boat lines to establish and maintain rates on certain of these commodities between the two coasts that are far below the level of normal rail rates on the same traffic has been amply demonstrated by the rates maintained during the first year the Panama Canal was in operation.

It is stated that it has been demonstrated that the boat lines can make and have made rates between the coasts very much below any scale of rates which we could require the rail carriers to maintain and these carriers now urge their right to maintain such an adjustment of rates as will keep their lines in an attitude of preparedness for the boat competition which sooner or later may be expected again to develop. It is earnestly urged that if the carriers under present circumstances are required to readjust their rates between the two coasts to a level not lower than the rates to or from intermediate points, the water lines, when the boats return to the service, will establish rates at a level that will take the traffic away from the rail lines. An application on behalf of the railroads for relief from the provisions of the fourth section as to these rates must be supported by competent proof as to the then existing competition by water alleged to make necessary the relief sought. In the natural and orderly course of procedure, several months may elapse between the time when the water competition manifests itself and the time when the rail carriers can make effective such rail rates as are necessary to meet this competition.

It is asserted that no sooner would these rates be established than the boat lines would make a further reduction sufficient to secure the traffic, whereupon the rail lines would find it necessary to make a second application involving further time during which the rail lines would be deprived of the traffic. This process might have to be repeated several times before the rates reached a level as low as the boat lines cared to make them. The objection to this course of procedure is that the rail lines would be obliged to lose the traffic to the boat lines before being able to present convincing proof of the necessity for reducing the rail rates.

WESTBOUND COMMODITY RATES

The present commodity rates from eastern defined territories to the Pacific coast are divided into three groups, which have been known under the designations of schedules A, B, and C. Schedule A includes commodities which either are not adapted to water transportation or which originate in territory so far removed from the Atlantic seaboard as to make their transportation by water unlikely. This list includes about 100 items, among which are the following: Threshing machines, agricultural implements, vehicles, many furniture items and fragile articles, and various products of the soil, wheat, flour, etc. Upon these items the rates to the Pacific coast points are not lower than to intermediate points, and these rates are not the subject of consideration in this report. Schedule B includes about 350 items comprising articles which are more or less adapted to water transportation and upon which the carriers have been authorized to continue rates to intermediate points higher than to the Pacific coast terminals by the following percentages: 7 per cent from points in zone 2; 15 per cent from points in zone 3, and 25 per cent from points in zone 4. The zones referred to are those described in Commodity Rates to Pacific Coast Terminals. The list of the articles is quite general and includes certain varieties of agricultural implements, baking powder, bottles, brass and bronze goods, candles, certain mixtures of canned goods, carpets and rugs, clothing, dried fruits and vegetables, certain furniture items, and many other articles. The range of rates on the schedule B commodities varies to a large extent with the carload minimum applied. Most of the articles move on rates applicable to minima of from 20,000 to 40,000 pounds.

The great bulk of the articles move under minima of 20,000, 24,000, 30,000, 36,000, and 40,000 pounds. The rates on items which take a carload minimum of 20,000 pounds vary from \$1.10 to \$2.25 per 100 pounds. Two-thirds of these items take rates to the Pacific coast of \$1.50 or less. The articles on which a carload minimum of 24,000 pounds applies take rates varying from 90 cents to \$2.30 per 100 pounds. More than 70 per cent of these rates do not exceed \$1.50 per 100 pounds. The rates on the articles moving under a carload minimum of 30,000 pounds or more vary from 60 cents to \$2.50 per 100 pounds. There is but one item, viz., talc, on which the 60-cent rate applies from the Atlantic seaboard to the Pacific coast, but there are 16 items which move on rates as low as 75 cents per 100 pounds, and 120 items which move on rates of \$1 or less. One hundred and fifteen items move on rates varying from \$1.10 to \$1.25, while 98 items move on rates which are higher than \$1.25.

Schedule C includes articles which originate in large volume on or near the Atlantic seaboard, are particularly adapted to water transportation, and upon which the rates are relatively low. The list includes approximately 90 carload items, among which are the following: Certain mixtures of canned goods, many iron articles, nails, bolts, nuts, washers, bar iron, sheet iron, structural iron and steel, many paper articles, paints, soap, wire rope, and telephone wire. These articles move in carloads varying from 24,000 to 80,000 pounds. Forty per cent of the items are subject to a 40,000-pound minimum, and the present rates range generally from 65 to 95 cents. Thirty per cent of the items are subject to a 50,000-pound minimum, and the rates range from 70 cents to \$1 per 100 pounds. An 80,000-pound minimum applies on 7 per cent of the items, and the rates on these items vary from 65 to 75 cents.

The report then takes up the evidence submitted by the various interested communities. In conclusion the commission says:

The arguments advanced by the representative of the steamship lines and by some, but by no means all, of the representatives of the intermediate territory, urge that the policy of the commission hitherto consistently followed of

allowing the rail carriers to reduce their rates to water competitive points to a level lower than to intermediate points in order to permit the rail carriers to compete for the traffic with water carriers is against the public interest, because it tends to reduce the profits of the water carriers and the number of ships which would otherwise engage in the traffic.

The argument advanced by the water lines, if carried to its logical conclusion, means in effect that all traffic which may be hauled by water carriers should be reserved for their exclusive handling. The rail carriers can not maintain, under ordinary circumstances, a level of rates between the Atlantic and Pacific coasts, between the north Atlantic ports and ports on the south Atlantic or Gulf coast or between points on the Pacific coast that will be successful in securing any considerable amount of traffic in competition with water carriers without fourth section relief. We are of the opinion that the best interests of the public, of the transcontinental carriers, and of these intermountain cities in particular, will be served by a policy that permits the transcontinental carriers to share with the water lines in the traffic to and from the Pacific coast ports. The lower rates to the ports, however, when necessary, must not be lower than the competition of the boats makes necessary, and must be high enough to cover, and that by a safe margin, actual out of pocket costs of securing and handling the traffic. The shippers at the coast are thereby given the benefit of competing routes and competing markets of supply. The railroads are enabled to fill up their trains with traffic which, although not highly profitable, yields a revenue materially greater than the out of pocket costs of securing and handling the traffic, thereby adding to the net revenues of the carriers and to that extent lightening the transportation burden borne by other localities.

These transcontinental railroads can fairly expect such consideration as will permit them to continue to earn a reasonable return upon their property devoted to public use. If governmental control is so exercised as to prevent them from securing any considerable share of the business to and from the terminals and the largest possible return therefrom, such return must be derived from the other communities along their lines. It is perfectly clear that the Pacific coast cities have always paid lower rates than they would have paid were it not for the facilities they have enjoyed for bringing manufactured articles from the eastern manufacturing districts and for sending east the products of the coast states by water. It is also clear that the intermountain section of the country has paid and now pays rates for the transportation of these manufactured articles which are higher proportionately than is paid by the coast cities and probably higher than it would be necessary to maintain if the rates to the coast cities could be maintained at a level more nearly proportionate to the service given.

The situation, however, is one which these carriers can not control. The advantage enjoyed by these Pacific coast cities is in the long run a permanent advantage. A war of unparalleled extent, drawing into its service a great part of the shipping of the world, has for the time being deprived these cities of the advantage of any substantial degree of water service. The present conditions admittedly are not normal. It is very earnestly urged that these abnormal conditions, however, are temporary and that the long standing commercial conditions should not now be disturbed by any material increase in the coast rates. The present conditions may be temporary as measured by the period of years during which these transcontinental railways have been built, but it is not apparent that the conditions are temporary in that within any known period of time they will have passed away. Under the present circumstances the maintenance of these lower rates to coast points and higher rates to intermediate points is unduly preferential to the coast points and unduly prejudicial to intermediate points.

We are of opinion that all these rates in schedules B and C to the Pacific coast should be now realigned to accord with the long-and-short-haul rule of the fourth section. In this realignment regard should be had for the conditions now existing, but the conditions that have existed and may again exist should not be forgotten. The rates to all the interior states of Arizona, New Mexico, Nevada, Utah, Wyoming, Idaho, Colorado, and Montana, as well as to the Pacific coast states of California, Oregon, and Washington, should be adjusted at this time as fully as now can be determined, with especial reference to meeting all the requirements of sections 1, 3, and 4 of the act. The facts before us do not admit of such a finding as is sought by the carriers, the coast cities, and the eastern shippers, namely, that present conditions justify lower rates to the coast cities than to intermediate points. Neither do the facts altogether admit of such a finding as is sought by the representatives of the intermountain states, namely that all of these rates to the Pacific coast cities are in and of themselves reasonable and fully remunerative. Some of these rates from eastern territories to Pacific coast terminals are unreasonably low, judged by the standards of car-mile or ton-mile earnings that have been offered for comparison or the rates which we have established on like commodities on these and other lines in many cases. Some of the rates are not unreasonably low, and no relief should be granted as to the rates on such commodities even under conditions similar to those which existed the year following the opening of the canal. There are, as stated, other commodities upon which the rates as a whole are unreasonably low from some of the eastern territory, particularly from transcontinental groups A, B, C, and D, as evidenced by the car-mile and ton-mile earnings and other comparisons offered. The rates on many of these commodities to the coast cities in the past have been influenced by the rates afforded by the water lines. These water rates have been variable. Under these circumstances some of the rail rates to the coast points are in the nature of things subject to variation. The essential justification for lower rates to a more distant point than to an intermediate point is the existence at the more distant point of depressed rates, which the carrier is powerless to affect, and failure to meet which would prevent the carrier from participating in the traffic to the more distant point. That necessity as to some of these rates has existed in the past and may again exist. While there is good reason for a certain variation in the rates to the coast points there is no necessity or justification for such variation in rates to the points so far inland that they are not affected by combination on the coast. The rates to the greater part of this intermediate territory should not now be made to depend upon or vary with the coast rates. In Railroad Commission of Nevada v. S. P. Co., and City of Spokane v. N. P. Co., we proceeded in the light of the evidence then before us relating to the water competition to authorize the carriers to establish rates from Chicago, Pittsburgh, and New York to intermediate territory 7, 15, and 25 per cent, respectively higher than the rates contemporaneously applied to the coast. The evidence then offered afforded no basis for concluding that it would ever be necessary for the rail carriers to establish such a low level of rates between the two coasts as they have sought authority to establish on many articles since the opening of the Panama Canal. The total tonnage of the schedule C articles that originated in transcontinental groups A and B and moved thence via rail or water to Pacific coast terminals in the calendar year 1915 was 961,768 tons. During the year following the opening of the Panama Canal the westbound tonnage secured by the water lines was 951,044 tons. The range of rates applied by the water lines shown in the preceding pages of this report, the applications and proof offered in their support by the rail lines during 1915 for authority to meet these rates,

and the volume of tonnage secured by the water lines evidence the compelling nature of the competition with which the railroads have been and may be again confronted as to many of the articles that originate in territory contiguous to the Atlantic seaboard. It is apparent from the facts at hand that this entire list of commodities, particularly those embraced within schedule B, should be scrutinized with care, and that all articles upon which the rates that can be secured from the eastern defined territories to the Pacific coast are not unreasonably low should be eliminated from schedule B and conform hereafter to the fourth section. All articles which do not originate on or near the Atlantic seaboard and upon which rates have not been particularly affected by water competition should also be eliminated from schedule B. All of the products of the soil, as well as canned goods from California, Washington, and Oregon, move to eastern territory via all-rail routes on rates that accord with the fourth section. The products of the soil of the central and eastern states, grain, vegetables, seeds, roots and fruits, and canned goods, should also be transported to markets on the Pacific coast under rates that are in accord with the fourth section.

As heretofore stated, there are now in the transcontinental tariffs a considerable number of items on which the rates from groups A to F, inclusive, to Pacific coast ports and intermediate points are in accord with the long-and-short-haul rule. These items we have referred to as schedule A items. The following items*, shown in the tariff of R. H. Countiss, agent, I. C. C. No. 1019, cover articles that either do not originate in large volume on the Atlantic seaboard, or if so, the rates on such articles do not appear to have been materially affected by water competition and these rates should be realigned to conform for the future to the long-and-short-haul rule.

The issues in this case and the evidence offered do not afford a foundation upon which we could properly make a finding as to the reasonableness of each of the rates which should be established on the items named either to the coast or to the intermediate points. This must be done in the first instance by the carriers with due regard for all of the commercial, transportation, and competitive conditions affecting this traffic. In those instances in which the rates that can be secured to the coast points are of sufficient volume to admit of their grading to intermediate points the commodity rates to intermediate points should be graded or grouped in such manner as the varying conditions in the territory served appear to warrant. The commodities not named upon which the rates to coast points are lower than to intermediate points constitute a very important list of articles upon which, under ordinary conditions, some fourth section relief should be granted. We think now that these rates to coast and interior should be realigned to conform with the long-and-short-haul rule. The realignment on these articles probably can not be maintained permanently. While there are many reasons to believe that ultimately some plan of grading the rates on these articles from eastern defined territories to the intermediate points should be effectuated, the issues in this case are not such as to permit us, if we desired to do so, to prescribe such a plan of grading. Furthermore, the time is not opportune. Nothing in this report must be construed as authorizing the carriers to increase any rates to intermediate points except points to which rates are now constructed by the addition of arbitraries or locals to the coast rates.

LESS-THAN-CARLOAD COMMODITY RATES WESTBOUND

There are 117 items of less-than-carload commodity rates in the schedule B list upon which the rates vary from \$1.60 to \$5. There are 90 of these items to which rates apply varying from \$1.60 to \$2.50. Sixty of them take a rate of

\$2 and 14 a rate of \$2.20. Fifty-four of these 74 items are articles which are classified as first class in western classification upon which the class rates to the Pacific coast are \$3 from the Missouri River and \$3.70 from New York. The commodity rate applied to the coast is from 54 to 73 per cent of the class rate on the same articles. Fourteen of the 74 items are classified as second class and the class rates to the coast are \$2.60 from the Missouri River and \$3.20 from New York. The commodity rates on these articles to the coast are, therefore, from 62½ to 84 per cent of the class rates.

There are 90 items in the schedule C list now moving on commodity rates of from \$1.50 to \$2. Two of these are classified as first class, 33 as second class, 29 as third class, and 26 as fourth class. The commodity rates are approximately 80 per cent of the class rates from the Missouri River to the Pacific coast. There are 19 second-class items in this schedule C taking a rate of \$1.75 to the Pacific coast. Where a rate can be secured which is higher than \$2.50 it would appear unlikely that such rates have been affected in any material degree by water competition and such articles should move either on class rates or on rates which accord with the long-and-short-haul rule. It is our opinion that relief should not be afforded on any article taking a commodity rate higher than \$2.50 even under normal conditions or such conditions as existed during the year following the opening of the Panama Canal.

We are of the opinion that the rates upon the other less-than-carload items in these lists are unreasonably low and have been depressed by reason of water competition. The rates on these articles should for the present be realigned to accord with the long-and-short-haul rule. If the carriers desire to continue commodity rates on these articles to the Pacific coast which are less than the class rates applicable thereto, the rates to intermediate points on the same articles should be constructed in such manner that they bear to the class rates to the intermediate points the same proportion as the readjusted commodity rates to the Pacific coast bear to the class rates to the coast. That is to say, if the commodity rate on any article from the Missouri River to the Pacific coast is readjusted and made, for example, 80 per cent of the class rate from the Missouri River to the Pacific coast, commodity rates should also be established from the Missouri River to intermediate points which are approximately 80 per cent of the class rates on the same articles from the Missouri River to these points.

EASTBOUND COMMODITY RATES

By Fourth Section Applications 9813, 10110, 10126, 10155, 10186, and 10189 the Southern Pacific Company-Atlantic Steamship lines and the Atchison, Topeka & Santa Fe in connection with the Mallory Steamship Company, sought and obtained authority from the commission to reduce the rates on barley, beans, canned goods, asphaltum, wine, and dried fruits from California ports, via rail-and-water lines through Galveston, Tex., to Atlantic seaboard ports, while maintaining higher rates from, to, and between intermediate points. These applications were made early in the year 1915, when the boat lines operating via the Panama Canal were actively engaged in building up business via their routes and were in fact transporting a very large percentage of the tonnage of these commodities at rates from 10 to 40 cents lower than the rates which the rail-and-water lines then sought to establish. The order issued in Reopening Fourth Section Applications, rescinded, effective September 1, 1916, the fourth section orders issued responsive to the fourth section applications above named. As before stated, the schedules filed with the commission effective September 1, naming increased rates on these commodities, were suspended until December 30, 1916, and subsequently canceled. The schedules which became effective March 1, 1917, had the

*Here follows a list of about 110 commodities.

effect of increasing the rates on these commodities by 10 cents per 100 pounds. Although it is clearly apparent that there is no necessity on account of existing competition by water for the maintenance of lower rates from the ports on these commodities than the rates from and to intermediate points, the carriers seek authority to continue these rates that they may be prepared for the water competition when it returns. Dealers in these commodities, both on the Pacific coast and in the eastern territory, support the application of the carriers. There was very little offered in evidence by carriers or interveners respecting the level of rates which might reasonably be applied on these commodities. We can see now no justification for the continued maintenance of lower rates on any of these commodities from the Pacific ports to the Atlantic seaboard than are applied from, to, or between intermediate points.

We have considered carefully all of the facts urged by the carriers in support of their applications for authority to continue lower rates to the coast than to intermediate points, the statements made by representatives of shippers and receivers of freight, at the coast cities in the eastern shipping territory, and in the intermountain section. We have stated that the rates, both eastbound and westbound, should be revised at this time in such manner as to bring them into accord with the long-and-short-haul rule. When the water competition will return in force and in controlling amount between the two coasts is uncertain. We are of opinion that the carload rates on all of the commodities in schedules B and C shown in the present transcontinental tariffs, with the exception of those we have above enumerated by item number and caption, have been affected by water competition to such extent as to justify some fourth section relief under normal conditions. We are of opinion that the less-than-carload commodity rates which are less than \$2.50 per 100 lb. have been brought about as the effect of water competition and that some fourth section relief is justified on these commodities under normal conditions. When the water competition again becomes sufficiently controlling in the judgment of the carriers to necessitate the reduction of the rates to the coast cities to a lower level than can reasonably be applied at intermediate points, the carriers may bring the matter to our attention for such relief as the circumstances may justify. Competent proof must be submitted in connection with such applications of a fairly regular water service between the two coasts; the adaptability of the traffic to water competition; principal points of origin of the traffic; range of rates afforded by the water lines; principal points of consumption; and the ports upon the two seaboard at which the water carriers receive and deliver freight.

We are not unmindful of the claims of the carriers concerning the disadvantage under which they labor in being unable to reduce their rates promptly when necessitated by the competition of the water carriers. One of the primary purposes of the act to regulate commerce was to preserve competition between carriers. Competition involves a striving between or among two or more persons or organizations for the same object. There can exist no even-handed striving between two persons when one is bound and the other is free, and the maximum of real and effective competition can not exist between these boat lines and rail lines when one side is free promptly to make any rate it desires, while the other is so restricted by statutory requirement as to be unable to take the necessary steps for the prompt protection of its business. We are, however, also mindful that one of the primary purposes of building the Panama Canal was to assist in the development and maintenance of an active, efficient, and profitable water service between the two coasts. It is not our purpose to put upon these carriers any undue hardship in their attempt to meet such competition as the future holds for them. Such fourth section applications as they may find it necessary to make with reference to this traffic will be disposed of with such celerity as the circumstances may permit.

Neither is it our purpose to permit the maintenance of rates to or from Pacific coast points at a level that will render this service unattractive to the boat lines.

An order will be entered denying the authority sought by these applications to continue lower rates on commodities to more distant than to intermediate points, and rescinding all previous orders entered in regard thereto.

DISSENTING OPINION

Commissioner Harlan, in a dissenting opinion, said in part; that the intermountain territory in the past has labored under unnecessary rate disadvantages sufficiently appears from the commission's reports in various proceedings in which those rates were under consideration; and in so far as the findings of the majority in this proceeding require the correction of any unlawful inequalities against that territory in the present rate adjustments of the defendant carriers, I fully concur.

The readjustment now required by the majority is to continue, as their report indicates, only during the remainder of the war and until commerce again moves through the canal. If the resumption of the water traffic may reasonably be anticipated in the near future, the disruption, coming nearly three years after the war commenced, of the present relations between the Pacific coast and the intermountain territory would seem to be highly unnecessary and undesirable. But even if the war conditions should continue and the resumption of commerce through the canal should not take place for two or three years longer, that would be but a moment of time compared with the period during which the present rate relationship has existed, and compared with the indefinite future during which, so far as we may now see, that general relationship must continue, because of the fixed and lasting character of the controlling natural conditions that we have been considering. The temporary interruption of the present relationship either for a few months or for several years, if the war conditions continue so long, can contribute nothing of substantial or continuing value to the prosperity of the intermountain territory. Its only effect will be to put the two territories temporarily out of line with what must necessarily be the course of their future relationship. During the period of the interruption the merchants of the intermountain cities may have a larger business than they otherwise would, while the merchants of the coast cities may have to pay materially higher rates on their traffic. These advantages, however, will be but temporary; they will not be constructively helpful to the intermountain territory or be of real aid in its future upbuilding; and in the meanwhile the merchants of both the competing territories will be left in perturbation and doubt respecting the contracts and commercial engagements that they may safely make while the purely provisional rate adjustment required under the majority report is in effect.

In my judgment rates and trade relations, based on conditions so permanent and enduring as the coast to coast water route through the Panama Canal, ought to be stable and secure against needless fluctuations, and I see no warrant either in the law or upon the record for now throwing both into sudden and violent confusion because of purely abnormal and temporary conditions.

RELIEVING CAR SHORTAGE IN SPAIN.—Hereafter the Spanish consignee will take his freight within five days or else his goods will be sold at auction. The Spanish government has issued more stringent orders regulating the transportation of merchandise and the better utilization of rolling stock. As platforms and freight depots are overcharged with merchandise, the work of unloading is frequently interrupted, and in order to relieve this congestion the railroad companies have been authorized to sell at auction all the merchandise not withdrawn by the consignees within five days from the date of its arrival at destination.

ELECTRIC INTERLOCKING INSTALLED AT A BUSY CROSSING

The new electric interlocking plant at Corwith (Chicago), Ill., about six miles from the Chicago union station, will eliminate the necessity for stopping about 45 through passenger trains each day on the main line of the Chicago & Alton and the Atchison, Topeka & Santa Fe, and in addition will greatly facilitate the numerous through freight and local switching movements at this point. The plant is located at the crossing of the Illinois Northern with the parallel lines of the Santa Fe and the Alton, and includes, in addition to the double crossing, junctions and wyes on both tracks. This crossing is in the industrial district of the city's southwest side, the Illinois & Michican canal being situated between the Santa Fe and the Alton, and the drainage canal just north of the Santa Fe. There are large terminal and classification yards in all directions and switching moves between these yards are being made over the crossing almost continuously during certain portions of the day. Four switching engines are always in service within the limits of the interlocking and at times 19 trains or engines have been counted waiting to make a move through the plant.

On the Chicago & Alton, the Glenn yard, where all interchange freight from foreign roads is received, is located about three miles west of Corwith, and at Brighton Park, about one-half mile east of the new plant, there is a large engine terminal and yard. The Santa Fe's Corwith yard, its principal freight terminal in the Chicago district, lies immediately south of the double crossing and the Thirty-third street yard of the Illinois Northern is immediately north. While at the crossing the Illinois Northern has only a

& Alton, the Atchison, Topeka & Santa Fe, and the Chicago & Western Indiana.

This double crossing was formerly protected by a mechanical interlocking plant, which was taken out of service in 1910. Since that time the Chicago & Alton has maintained one switch tender at this point, the remainder of the switch-throwing being done by train crews. The decision to build the new plant was made on the double ground of providing desirable protection at this busy point and facilitating train movements.

The tower, as shown in the illustration, is a two-story brick structure on concrete foundation with slate roof. A small one-story addition on one end houses the storage batteries. The ground floor of the main portion of the tower is divided into two rooms, one for the hot water heater and maintainer's quarters, and the other for the relay cabi-



Signal Tower, Corwith, Illinois



Illinois Northern and the Santa Fe Wye

Chicago & Alton Three-Arm Signal

single track and the Santa Fe and Alton each two tracks, the Santa Fe expands to three tracks just east of the plant and to five tracks just west, while the Alton has four tracks on each side of the crossing. The tower, which adjoins the Alton main line, is placed back from the nearest track a sufficient distance to allow the addition of a third track if this becomes necessary in the future. The plant is very much spread out on account of including all of the junctions, there being a distance of about 3,000 ft. from the tower to a five-track bridge on the Santa Fe west of the crossing, about $1\frac{1}{4}$ miles to two outlying switch locks on the Santa Fe to the west and about $1\frac{1}{2}$ miles to the Santa Fe distant signal on the west, which is also the home signal for the interlocking plant at Nerska, used jointly by the Chicago

net and power unit. The second floor of the tower is occupied entirely by the operator's room.

The normal supply of power is obtained at 220 volts a.c. from an adjacent commercial line which supplies a motor-generator set, used normally for charging the storage batteries, and a small transformer with 75-volt and 10-volt taps for locks and lever lights. The emergency power supply is furnished by a Fairbanks-Morse d.c. dynamo, direct-connected to a gas engine. The battery installation consists of 57 cells of 200-a.h. capacity Electric Storage Battery, chloride accumulator type, for switch and derail machines, and high signals, and two sets of five each of 200-a.h. battery of the same type for lever lights, locks and repeating relays. This battery is supported on a wooden rack which is mortised and pinned together without the use of nails.

The interlocking machine is of the G.R.S. unit-lever, model 2 type with 78 working levers in a 104-lever frame. The additional room is provided for additions to the plant that would be necessary if a third track were to be added on the Chicago & Alton. The machine has lever lights, which are lighted when a track circuit is occupied.

A marked difference is noticeable between the signaling standards on the two principal roads in this plant. The Santa Fe uses a one-arm signal with 10 to 12 possible routes, while the Chicago & Alton has three-arm signals for three routes. No distant signals are provided on the Illinois Northern as only switching movements are made over that line. As the normal-danger system is used on the Chicago & Alton west of this plant, a special control circuit was necessary for the first automatic signal to the west. This circuit operates as follows: When a westbound train enters the annunciator circuit, the control of the first two-position automatic signal west of Corwith is cleared by the contact

on the back point of the annunciator, and holds clear on the back points of the track relays between the home signal and the advance signal after the train passes the home signal.

All signals are electrically lighted and a pilot light located over the interlocking machine in the tower is connected in each lighting circuit so that if any one light fails, an immediate indication will be provided. This system has been in service more than a year at another point on the Chicago & Alton, and has given good satisfaction.

Approach, route and sectional locking are provided on both the Santa Fe and the Alton, with annunciators to warn the towerman of the approach of trains. There are no annunciators or track circuit locking on the Illinois Northern. G. R. S. push releases are used for track circuits, and screw releases for signals and switch locks. The operation of the electric switch lock requires the co-operation of the operators at Corwith and Nerska.

All track circuits are d.c. supplied with energy from BSCO batteries located in battery chutes. The battery for operating distant signals is of the same type, located in wells. All relays are of G.R.S. manufacture. Switch machines are G.R.S. model 2, and all signals are G.R.S. 2A upper-quadrant. Okonite insulated wire was used throughout.

This plant was installed by the General Railway Signal Company, under contract with the Chicago & Alton, and will be operated by the Alton. We are indebted for courtesies in securing the above information to G. W. Hulsizer, superintendent of telegraph and signal engineer, and S. U. Rhymer, general signal inspector of the Alton.

LESSONS FROM THE FREIGHT CONGESTION

By J. E. Campbell

Freight Agent, Pittsburgh & Lake Erie, Glassport, Pa.

The congestion which existed throughout the eastern states during the first three months of the present year, which continues to exist in some quarters and which undoubtedly will recur from time to time for some months to come, can only be solved by the exercise of common sense, good judgment and determination. It is not wholly a question of additional facilities, more cars, more engines and greater terminals. It is rather a question of utilizing present facilities to their full capacity and securing the greatest possible results from the existing transportation plant.

During the past winter many traffic men explained the congestion which existed as far west as the Mississippi and south to the Ohio river and Virginia gateways by the rush of export business and the unprecedented total volume of business the railroads were handling. This was true only in part. The export problem had been solved, in large measure, early in 1916 by the permit system. Furthermore the volume of business on some of the worst congested roads was not as heavy as was handled one year previous when there was no congestion. One of the worst things with which the railroads had to contend was a demoralized labor situation. The injection of many new and inexperienced men into all departments and the general restlessness which has prevailed among all classes of labor everywhere was the main factor in the breaking down of many roads. Throughout 1916 the railroads lost many of their old and best men, for industrial concerns did not hesitate to bid a few dollars per month or a few cents per day more than the railroads were paying and thus take many of their employees.

Last winter furnished a good object lesson of what can be done when the effort is made. After dragging along for weeks under demoralized conditions different lines suddenly made the effort and found that order could be restored much quicker than they imagined. The New Haven did some

good work in this direction early in the winter and conditions on that line were improved in an incredibly short time.

The same means used to relieve congestions will, in most cases, prevent them. The first step in applying the remedy is a general stock taking. A careful survey should be made of conditions as they exist upon the road, the situation at different points being studied and analyzed carefully, the relations with connections examined and peculiar conditions at different points that complicate operations ascertained and overcome. The proper officers should at all times have a full and complete record of every load on the line, showing the destinations for local roads and the route for loads going to connections. There should also be full and complete reports showing the number and kind of all empties. These reports should be as simple as possible so as not to be burdensome in making or in use.

With a thorough diagnosis of the situation all over the road it is possible to apply the best remedy. Congestions on most lines are, as a rule, a result of terminal conditions. Such conditions are usually accompanied by a demoralization of the operating forces in the yard. The first step is to restore some measure of order at such places and to get the work organized again with some system. Tracks must be checked carefully and switched properly; all loads for team tracks and industries must be placed and delivered promptly; empty cars should be moved out of congested districts promptly, even though it may be at a sacrifice of new business sometimes, so that it will not be necessary to handle them repeatedly in switching loaded cars; billing should be secured for all "No Bill Cars" for these delinquents are one of the most troublesome and expensive problems in any yard or at any terminal or connection. "Hold" cars should be segregated so as not to entail undue handling with live loads. Outbound loads should be properly and carefully classified and moved at the first possible moment. Classification tracks should be maintained inviolate and not used for storing unswitched trains and "hold" cars. Team, industrial, "hold" and storage tracks should be switched regularly and according to a fixed schedule. There must be co-operation between day and night yard forces in order that any advantage gained during the day may not be lost at night. Shop cars should be placed on shop tracks or moved to shops regularly and without delay.

When order and system have once been restored in terminals and yards a long step has been taken towards improving conditions over the entire line. There are but few instances in which order and system cannot be brought about in a very short time when the necessary effort is made. It is possible to congest a yard when it does not contain more than half the cars its capacity calls for, or to bring business to a standstill when only a small percentage of the maximum traffic that might be taken care of is being handled through a terminal. The details of this work can best be studied by the man on the ground. Yardmasters, trainmasters and other operating officials should spend much time on the scene of action. The details of correspondence and office work should be left, in a large measure, in the hands of their clerks and subordinates. Too many officers are filling the places of clerks at their desks. The best results will be attained when the responsibility is passed down the line to the lowest ranks and each officer holds his subordinates to strict account for results. Unfortunately the reverse of this has too often been true in railroad organizations and each employee has been passing the responsibility for bad conditions up to his superior instead of assuming his own share. When each employee begins to feel that he has a responsibility there can be no question but what greater results will be secured.

Diplomacy can be made an important factor in improving conditions on many roads. There is opportunity for its use between the road and the public; between the various roads

and their connections, especially at junction points; between the several departments and between the officers and their subordinates. There never has been a time when the public has been so ready to co-operate with the railroads; particularly is this true with the more important shippers. Consignees are very ready to speed up their unloading and release loaded cars promptly when placed upon their sidings. Agents and yardmasters will have very little trouble in this direction if they handle their patrons judiciously. The shipping public is fully conscious of the fact that any effort the railroads make to better conditions, to increase the car supply, or give more prompt service is to the benefit of all patrons of the roads. Shippers are also aware that the efforts the railroads may make to take care of the business of the country will be backed up by the Interstate Commerce Commission and the Federal Government. A willingness has been found on the part of shippers to load cars heavier, observe car service rules relative to loading foreign cars, unload and release cars promptly when placed in their plants, furnish advance information as to their shipments to enable the railroads to provide proper equipment and load their cars so as to enable the roads to observe regular schedules. The few shippers who have not co-operated along these lines are fit subjects for diplomacy and if they are approached in the right manner in most cases can be lined up to do their part.

There is special need of co-operation and diplomacy between connections at junction points. There can be no greater factor in the successful operation of the various roads than a free interchange at junction points. Here is where every yardmaster, agent, clerk, train crew, car inspector, as well as officer, can do much to help. There should be a policy of give and take. Each road should meet its connections half way and should accept a car for every one it can deliver. In fact, oftentimes it would be justified in accepting two cars for each one delivered provided such action would help to clear up the general situation. The cars coming to such a road must eventually be accepted and moved to destination, and the sooner this is done the sooner conditions as a whole will mend and the better will the public be served. At junction points even the car inspector can do much to improve conditions. Co-operation between inspectors of connecting lines will often work wonders. They can unite in making light repairs, in issuing defect cards for cars not carrying penalty defects, and in keeping many cars out of the shops and off repair tracks, thus reducing congestion. Yardmasters and their crews should learn the lesson that in helping their connections they are also helping themselves.

The embargo has played an important part in the operation of most of the roads during the past year. It is an instrumentality of great good at times, but one which should not be abused. It is to be feared that the embargo has been used many times when what was needed was an effort and determination to move business and overcome trying obstacles. The embargo should not be used to stop the regular and natural flow of business. It should not be used to interfere with the movement of cars and shipments which the consignee is waiting to receive and accept at once on their arrival at destination. Under such circumstances what is needed is extra effort to meet the unusual conditions and get the business through to destination.

As stated above the conditions that have existed on our railroads were largely the result of a demoralized labor situation. There long has been the need of some plan on the part of the American railroads to bring out the best efforts of all employees. During the past year many industrial concerns have adopted the bonus system to increase production and stimulate their employees to their full capabilities. Some such system is needed on our railroads to reach every de-

partment. A system of this sort does not necessarily mean the payment of large sums of money to attain results, but rather the recognition and encouragement of faithful employees. More sure prospects of promotion, the consciousness that their efforts will in some manner come to the notice of their superior officers, special vacations sometimes, in fact, a multitude of things might be done in this direction that would be as effectual as the payment of cash bonuses have been in the industries.

RAILROAD TRAINMEN AS MISSIONARIES OF PUBLIC OPINION

In a circular recently issued by T. J. Foley, general manager of the Illinois Central, trainmen and enginemen are urged to use such opportunities as present themselves to set forth the railroad side of the transportation question. The extensive possibilities of enlisting these employees as proponents of railway interests in their intercourse with the public, led Mr. Foley to relate the following incident as an example of what can be done:

"One of our conductors discussed the railway situation with a prominent farmer. The conductor knew all about the Illinois Central property and management. He impressed the farmer, who repeated the substance of what the conductor had said to a local merchant. Our superintendent called on the merchant in the usual course of business and found him in the midst of a heated conversation with a politician. The merchant was trying to impress upon the politician that a broad policy toward the railroads benefited everybody, and that a narrow policy injured everybody. The politician left the merchant and the superintendent together. The merchant explained that he had gotten his inspiration and his facts from the farmer. The alert superintendent made it a point to get acquainted with the farmer and learned that he had formerly been very antagonistic to the railroads and had been changed completely by the interview which he had had with the conductor."

The experience described convinced Mr. Foley of the advantages of inaugurating a series of educational circulars to keep trainmen posted on railway affairs, and especially those of his own company. He said:

"The thought occurred to me that perhaps the management was to blame for not giving trainmen and enginemen something to talk about. We would like for them to do a good deal of talking, for we recognize the fact that they are both able and willing to do it. Therefore, I have concluded to give them little bits of information about our company from time to time, and I am going to ask that each trainman and each engineman consider that he has been constituted a committee of one to talk about the Illinois Central to the public. If each should talk with only two or three persons each month about the needs of the railroads, it would do a great deal of good."

In the first circular, introducing the plan, Mr. Foley proceeded to put his scheme into effect by presenting in concise form some essential facts concerning the Illinois Central. Among the points covered are the mileage and location of the line, its capital stock, the number of stockholders, the amount of equipment owned, the number of trains operated, the number of employees and the total of their wages, the company's consumption of coal and the cost of fuel, recent purchases of cars and locomotives and increases in prices in the past two years, operating revenues and expenses for the past six months as well as taxes, interest and dividend requirements; and the need of the company for larger terminals and more equipment to take care of constantly increasing business.

Car Conservation Meeting at Chicago

Instructive Discussion of Details of the Far-Reaching Freight Car Problems Now Pressing for Solution

A CAR conservation luncheon was held at the Hotel La Salle, Chicago, on July 17, at which representatives of the railroads and the shippers presented their points of view on available means of increasing transportation efficiency to the end that the present crisis may be passed without serious injury to the country. F. B. Montgomery, manager of the traffic department of the International Harvester Company, Chicago, acted as toastmaster.

BOTH SIDES OF THE CAR SHORTAGE PROBLEM

H. C. Barlow, traffic director of the Chicago Association of Commerce and advisor to the new Division on Car Service of the Interstate Commerce Commission, spoke on "Both Sides of the Car Shortage Problem." He appealed to railroad men and shippers alike to forget their former differences and join in an earnest co-operative effort to pull the country through its most serious transportation crisis. He said: "It has been said the transportation systems have broken down. That's not true as I see it now. We have flooded them, that's all."

He addressed his remarks first to the carriers and then to the shippers. To the former he advised against further slowing up of freight schedules. He said, in part:

"I have heard it estimated that the lengthening of the schedules that took place about 1911 consumes about 5,000 car days. I know and appreciate your argument for heavier trains but I ask, under present conditions, if that is true economy?"

"A great and successful effort is being put forth to persuade the shippers to buy and load heavier. Are you loading and unloading your companies' coal, material and supplies with the same promptness and despatch you properly require at the hands of the shippers? If not, why not?"

"Under M. C. B. rules a surprisingly large number of cars are seemingly put out of service, an unusual length of time awaiting proper parts with which to make repairs, that is, for just the right brake beam, etc. In the present emergency cannot this be avoided by putting on a safe brake beam, thereby getting the car back into service at once?"

"Referring to full capacity car loading and ordering a survey of the shipments of one of the largest lumber concerns in the South discloses the following for the four months ending April 30, 1917. It shipped 7.72 per cent more cars and 23 per cent more lumber; during the month of May it shipped 27 per cent more cars and 53.5 per cent more lumber. Taking the five months ending May 31, 1917, these mills shipped 12 per cent more cars and 30 per cent more lumber. The average loadings exceeded 60,000 lb., in spite of the fact that they have loaded a large number of stock cars, many of which were of the double deck variety. This is certainly a most excellent showing.

"The president of this company, however, writes: 'Strange as it may seem, we have just received an inquiry from a certain large railroad in which it asks our people to quote prices on three or four minimum cars. The sales department has replied that in view of existing conditions it could not quote on minimum cars but the prices attached were for maximum cars.'

"I know this to be true in the matter of other materials for account of the railroads. Many small lots are ordered because the distribution is to two or more supply shops. I respectfully ask the railway gentlemen, 'Why not double load these cars as the shippers are doing in many instances?'"

To the shippers he put the following pointed questions to impress upon them the importance of action at this time:

"Do you want to help win the war for our country? Do you desire to add very greatly to the amount of equipment in the country that you may be sure of having more cars? Do you desire to increase the terminal facilities of the country, thereby avoiding blockades and embargoes? Do you really want to do these things without expense; in fact, save money by doing it?"

It is the duty of shippers desiring these things, Mr. Barlow said, to conform to the following rules:

1. Unload every car at once. Don't wait for the free time.
2. Load every car promptly. Don't wait for, nor use all the free time.
3. Load all cars to their visible or carrying capacity.

Mr. Barlow emphasized the distinct advantages accruing from an adherence to these rules. He said:

"Remember it costs you more to handle two cars at the plant than one. It costs no more to sell 30 or 40 tons than it does 15 or 20 tons. Big loading cuts down expense at the plant and reduces selling cost. Try it, and in a while you will be surprised at the result. Do it now, it is the only way to save a bad situation. Let's not change the minimum in the tariffs, but ignore them in this great emergency."

He described in considerable detail the functions of the Commission on Car Service of the American Railway Association, the new Division on Car Service of the Interstate Commerce Commission, and the various subcommittees of the railroads and the National Industrial Traffic League recently created to assist in regulating the car supply. He urged the utmost co-operation between the carriers and the shippers to the end that the war may be won. In this regard, he said:

"The Interstate Commerce Commission has, figuratively speaking, placed one hand of the shippers and carriers together and in the other hand the traces and said: 'Now pull together and when you don't quite agree, come to us, but don't stop pulling the right way. Remember when you may be tempted to quit, the very safety of our country may be jeopardized.'

"In full realization of the tremendous responsibility resting upon us I urge shippers' and carriers' local committees to meet together often, to discuss every question fairly, and to forget past differences. Let's fight Germany during the war and Germany only. . . . The plan could not be devised better, the working out of it rests largely in your hands for in the very nature of things it could rest in great measure nowhere else. The successful outcome is fraught with tremendous results. Now every man to his task with a will and a cheer."

ADDRESS BY SAMUEL O. DUNN

Samuel O. Dunn, editor of the *Railway Age Gazette*, emphasized particularly that the transportation crisis now confronting the country threatens to become more acute with the increasing movement of troops and military supplies for the government. On June 1, the net shortage of freight cars reported by the American Railway Association was 105,000. Although this was a decrease of 30 per cent under the shortage reported on May 1, it far exceeds the largest previous shortage reported for the same months, which was 8,000 cars in June, 1907.

Although it must be admitted that railroad facilities are inadequate, it is not a fact that the carriers are failing to perform the work which should reasonably be expected from

them. On the contrary, statistics show that the railways are handling more traffic by far than ever before, indicating that the real reason for a car shortage is the tremendously increased business offered them since the inception of the war. In the fiscal year 1916, they hauled 343,000,000,000 ton-miles of freight, an increase of 66,000,000,000 over the previous year, and 42,000,000,000 over any other year on record. The gross freight earnings for the first four months of 1917 were \$853,000,000 as against \$790,000,000 in the same period of 1916, or an increase of eight per cent. As rates have not increased, these figures truly reflect the increase in freight handled. Statistics for freight traffic moved by American railroads in April, 1917, show an increase of 16 per cent over the same month in 1916. This is a remarkable achievement in the face of a net increase of only 46 locomotives and 11,000 freight cars. Factors contributing to the results attained were an increase in the average trainload from 637 tons in April, 1916, to 703 tons in 1917, or 14.5 per cent, and an increase in the average carload from 24 tons to 26.4 tons, or 10 per cent.

In the fall when the heavy burden of military traffic begins to be felt, the problems of railroads and shippers will become even more complex. What has happened abroad is indicative of what will happen here. In England there has been an increase in freight business of 50 per cent since the beginning of the war, and on the French railroads an increase of 100 per cent. Unless superhuman efforts are made by all concerned, considerable freight business will not be moved at all.

At no time previously have shippers shown a greater disposition to co-operate with the railroads for transportation efficiency, and at no time has such a co-operative spirit been so vitally necessary as now. It is highly essential that those who are fitted by long experience in the actual operation of our carriers be permitted to direct the work of solving the pressing problems confronting the railroads. Five men pre-eminent in the transportation world have been selected to control the operation of the nation's railroads as a unit. They represent the best brains and ability in their sphere, in the estimation of railroad men, and will do the work assigned to them as efficiently as is humanly possible, if they are not interfered with by the government.

ADDRESS BY J. F. PORTERFIELD

J. F. Porterfield, general superintendent of transportation of the Illinois Central, also laid considerable stress on the importance of frequent conferences between the shippers and the railroads in the interests of car conservation. He outlined the work already done in this direction by the Illinois Central, which has effected an increase in average car mileage per day from 26 to 44, an increase in the average carload from 25 to 27 tons, and a decrease of bad order cars in two years from 9.6 per cent to 5.1 per cent. He stated that the Railroads' War Board estimated that by heavier loading and quicker repairs the railroads could further increase car efficiency equal to adding 779,000 cars to the available equipment. An additional saving, equal to the present car shortage, can be made, he said, by eliminating the delay incident to holding cars for reconsignment and surrender of bills of lading. In this regard, he said:

"After years of effort the railroads have finally agreed on filing tariffs covering uniform reconsigning rules and charges, and, while these rules will not prohibit reconsigning, they make a reconsigning charge of \$5 where the movement of the car is interrupted, and a nominal charge of \$2 where the car is reconsigned without being delayed or diverted from the current of traffic. It is thought the \$3 difference in the charge will greatly reduce reconsigning in hold-yards and increase the placing of reconsigning instructions with the railroads sufficiently in advance of the arrival of cars to effect the reconsignment without diverting cars from the current of traffic

to hold tracks. It is probable that the National Industrial Traffic League and the Committee on National Defense of the American Railway Association can prevail upon the Interstate Commerce Commission to permit these reconsigning tariffs, now under suspension, to go into effect at once.

"The practice of billing freight to 'shipper's order, notify' now and always a source of serious loss in car efficiency, is causing additional car delay owing to the present banking system requiring the handling of bills of lading through several banks, resulting in a large number of cars being delayed awaiting surrender of bills of lading; although, of course, the most serious delay is caused by diverting cars from the current of traffic to hold-yards while the party named in the billing is receiving notice, obtaining and surrendering bill of lading. An order should be issued by the commissions having authority, to prohibit this practice during the present car shortage.

"To increase cars available for hauling coal authority should be given by the Interstate Commerce Commission and the Illinois Public Utilities Commission, as recommended by the Illinois State Council of Defense, to permit the railroads, during the present emergency, to reduce the free time for unloading coal from 48 to 24 hours."

ADDRESSES BY MESSRS. FORSYTHE AND BODE

D. I. Forsythe, vice-chairman of the Chicago committee of the Chicago Car Service, outlined the purpose of his committee and others organized in other large traffic centers of the country, and invited the co-operation of shippers in working out the problem of increasing the available supply of cars.

W. S. Bode, vice-president of Reid, Murdock & Co., Chicago, told how at the last annual meeting of the National Wholesale Grocers' Association a War Service Railroad committee had been appointed, with him as chairman, to investigate means of assisting the carriers in conserving cars. Among the recommendations the committee had made are the revision of prices of certain lines of goods now bought and sold in so-called carload units, greatly below the maximum lading, to conform more nearly with car capacity; and more complete co-operation between the merchant and the railroad especially in the giving of prompt information concerning unusual delays, particularly to carload shipments, either in transit or in placing after arrival, or in moving from the shipping track after loading. Some members of the association have submitted the following suggestions to the committee: (1) The elimination of the present delay to sight draft shipments by giving a bond of indemnity to the railroads in advance, thereby insuring the immediate delivery of the car on arrival. (2) Allowance of a slight difference in rates between a maximum loaded car and a minimum loaded car. (Such a reduction is now allowed on all maximum loads of canned goods and dried fruit shipped from Pacific coast points.) (3) The abandonment of all classifications for food products and the adoption of one or at the most two—one classification for raw materials and the other for manufactured products. This would result in an enormous saving to the railroads in the cost of clerk hire, checkers, billers, abstractors and revisors. All bills of lading would have but one entry, viz., food products, giving the number of cases or bags, etc., and the weight.

1,500 MILES VIA TRUCK.—A large tire manufacturer has recently inaugurated the policy of shipping its product all the way from Akron, O., to Boston, Mass., by motor truck. The trucks take about four days to make the trip of 1,500 miles, and are fitted with a sleeping compartment to be used by the two drivers who take turns at the wheel. On the return trip the trucks are loaded with cotton fabrics from mills in Connecticut. The big trucks carry a sign reading "Akron-Boston Express."—*Wall Street Journal*.

THE MECHANICS OF THE CHILLED IRON WHEEL*

Chilled iron possesses inherent qualities which are not found in other metals and its principal characteristics are its ability to carry any load that can be supported by the steel rail without crushing or flowing.

The mechanics of the chilled wheel have never been investigated except in a very superficial way. The fundamental properties of chilled iron, such as specific gravity, modulus of elasticity for varying tensile strengths, action under repeated stresses, relation of operating conditions to temperature stresses, etc., are not established. If the properties of chilled iron were fully understood and properly used in the wheel, a large return on the meager expenditure for investigation would flow in upon the manufacturers in the way of increased profits and to the railroads in the way of reduced costs.

The loads carried by the wheels and rails have been constantly increasing and the question now arises—are we nearing the limit for wheel loads? If so, what is the determining factor? What margin still remains for further increases, in bearing power of the metal of wheel and rail, in flange strength, in web and hub. These are the questions we propose to answer by considering each part of the wheel separately.

Bearing Power.—The bearing power of iron or steel is largely controlled by the carbon content and naturally since the tread of the cast iron wheel contains 3½ per cent of carbon it has a much greater bearing power than the rail which contains less than one per cent of carbon. A 33-in. chilled iron wheel will not perceptibly flatten under a load of 250,000 lb., which is 8 or 10 times the present maximum wheel load. Chilled iron wheels are in common use carrying 100,000 lb. or more under large cranes, unloading bridges, transfer tables, hydraulic locks, etc. To carry these loads wide special flat-top rails are necessary.

The ordinary railroad rail with a 12-in. top radius will develop a permanent set when the indentation of the wheel into the rail amounts to .007 in. If we assume that the maximum load carried in rapidly moving service should not cause when at rest an indentation greater than one-half this amount, the limiting loads from the rail standpoint are readily calculated by the formula $L = 1,500,000 d \sqrt{D}$ in which L equals load, d equals indentation, into the rail and D equals diameter of the wheels. In this formula the pressure per square inch over the area of contact between wheel and rail is taken at 100,000 lb. per sq. inch. The limiting loads for various diameters of wheels are:

42 in. wheels.....	34,000 lb.	33 in. wheels.....	30,200 lb.
36 in. wheels.....	31,500 lb.	30 in. wheels.....	28,800 lb.

As far as the bearing power of chilled iron is concerned there is no indication of nearing the wheel load limit.

The Flange.—The pressure which the flange must resist in guiding the truck around curves is equal to ¾ of the wheel load, provided the track is perfect and the cars are in good condition. The pressure is not influenced by the degree of curve, velocity, centrifugal force or obliquity of traction, but an allowance must be made for impacts originating from irregularities in track and locked side bearings and center plates, which added to the curve pressure will make the total maximum lateral pressure against the flange 1½ times the wheel load, or 18,000 lb. for the 30-ton car and 46,500 lb. for the 85-ton car.

It is unreasonable to suppose that a flange designed for an 18,000 lb. pressure will have the same factor of safety for 46,500 lb. pressure, in fact the thickness of flange was de-

veloped when flange pressure did not exceed 8,000 lb. It is just as necessary to increase the flange section as to increase all other sections of the wheel, when increased duty is imposed. Notwithstanding the fact that the Master Car Builders' Association in its latest report stated that no increased flange width was necessary, this matter is by no means settled as far as other associations are concerned, and a movement is again started to determine whether the hundreds of thousands of flanges that are now in use (which are wider than the present M. C. B. standard flange) are not entirely in harmony with present track standards.

When this question is answered, we will have an opportunity to present to the Master Car Builders' Association a flange with a factor of safety proportional to the load carried, which is not a difficult proposition and which from an engineering standpoint is demanded.

Stresses Within the Plate or Web.—The University of Illinois has undertaken a thorough analysis of the properties of chilled iron and of the stresses within the wheel originating from all conditions that can arise in service as far as they can be duplicated in the laboratory. These items include specific gravity, co-efficient of expansion by heat, modulus of elasticity, tensile and compressive strengths, stresses in the wheel originating from pressing on the axle, from vertical load, from side pressure on the flange, and from difference in temperature between the tread and the plate. Tests are also to be made to discover the probable difference in temperature between the tread and the plate for continuous application of various brake shoe pressures at various velocities. An indication of the magnitude of these stresses already has been determined as follows:

From pressing on an axle having a 7-in. wheel fit at 60-tons' pressure, 18,000 lb. compression per square inch is developed in the single plate; the greatest tensile stress is in the hub. If the machine work is fairly well done these stresses are symmetrical, but if the wheel is irregularly machined, the stresses will be lunched and necessarily greater than normal, being at times sufficient to burst the hub. Under a vertical load of 200,000 lb. the maximum compressive stress occurs on the radial line between the rail and the hub amounting to about 18,000 lb. in the 725 lb. M. C. B. wheel; the tensile stresses in the tangential direction are about 12,000 lb. These stresses alternate at each revolution of the wheel. The maximum stresses are in the front plate. In the back plate the load stresses are practically nil.

The stresses from vertical load within the limits of railway practice are practically negligible.

The greatest stresses, and therefore the most important are the temperature stresses; for example, a 625 lb. wheel was placed in a brake shoe testing machine and operated at various velocities under a continuous shoe pressure of 1,500 lb.; this corresponds to the retardation required for a 50-ton car on a 3 per cent grade when operated at 5 m. p. h. and on a 2 per cent grade when operated at 50 m. p. h. Thermo-couples were placed ½ in. under the surface of the tread, under the rim, at the plate intersection and in the hub. These couples were connected by brushes to a collector ring insulated from the axle so that temperatures could be taken from any part of the wheel at any time without stopping the machine. After running the equivalent of 25 miles, the maximum stresses developed near the intersection of plates were found to be:

5 miles per hour.....	10,000 lb. per sq. in.
10 miles per hour.....	12,000 lb. per sq. in.
20 miles per hour.....	15,000 lb. per sq. in.
30 miles per hour.....	18,000 lb. per sq. in.
40 miles per hour.....	21,000 lb. per sq. in.
50 miles per hour.....	24,000 lb. per sq. in.

Since the above is a greater retardation than is required for controlling 30-ton cars it is evident that if the shoe pressure could be made uniform on all wheels of the train there would be no over-heating of wheels but there are so many

*Abstract of a joint address delivered before the Railway Club of Pittsburgh by George W. Lyndon, president, and F. K. Vial, consulting engineer, representing the Association of Manufacturers of Chilled Iron Wheels.

opportunities for irregularities in service that at least 200 per cent above the theoretical retardation required must be taken into consideration when designing wheels. The test also indicates the great benefit of thermal or cooling stations. Making standards for the car wheel without reference to fundamental principles is absolutely unjustifiable.

We may say frankly that the work which has been done for the past eight years by our association, in conjunction with committees and other associations with which we have had to deal, has not yielded us material results; nevertheless we have gone along in our work, firmly believing that we were on the right track and that sooner or later our recommendations would be endorsed.

RELOCATION OF FREIGHT EQUIPMENT

Reports to the Railroads' War Board from the Commission on Car Service show that orders have been given since May 1 to 36 separate railroads to move immediately 68,814 freight cars to 54 other railroads and that, of the total, 46,682 cars have actually been received by the roads for whose benefit this arbitrary movement was ordered, while 51,795 cars have already been delivered by the initial roads to intermediate lines in the direction of ultimate destination. This has been done by the Car Service Commission under the authority given it in an order of the War Board on April 26 to relocate freight equipment. In the first general order of the Commission on Car Service on the same date it was stated that the commission would undertake to regulate car supply as the exigencies may require and that roads having on line in excess of 100 per cent of their ownership of equipment, treating each classification separately, must so regulate their car handling as not to exceed the percentage on line as of April 1, 1917, or as may be designated by the Commission on Car Service.

The cars have been moved without load and in the quickest possible time, often in train load lots, from roads on which there has been an accumulation to roads on which there has been a shortage or which have had an especial need of cars for important shipments of materials needed by the government. As the principal movement has been from the east to the south and the west the empty haul has been in the direction in which the empty haul naturally accrues because of the preponderance of loaded movement to the east.

About half of the cars have been ordered to western roads and most of the others to southeastern lines.

In a statement announcing the distribution of these orders, Fairfax Harrison, chairman of the Railroads' War Board, says:

"In ordering empty freight cars to be promptly moved from one railroad to another, regardless of ownership, the Railroads' War Board has adopted a policy new to American railroad usage and hopes thereby to solve the problem of rapidly mobilizing in different sections of the country the freight cars necessary to handle the abnormal government and commercial traffic that war conditions have produced.

"Among the immediate and important results of this redistribution of cars will be the increased facilities for the prompt shipment of lumber to the army cantonment sites and the ship-building yards. Lumber for cantonments is to be supplied from the Carolinas, Florida, Alabama, Mississippi, Louisiana, and Arkansas. Thousands of extra cars have been supplied to the lines operating in these States.

"Mississippi and Alabama will supply the bulk of the lumber for new wooden ships that are being built, and the extra cars ordered there assure the movement of lumber to the Atlantic Coast shipyards.

"The movement of lumber for commercial purposes is likewise being facilitated in Mississippi, Alabama and Tennessee.

"In addition to accelerating the lumber movement, the redistribution of cars is expected to assist materially in the transportation of grain from the Middle West to the East. It has already facilitated the shipping of potatoes and other produce from Texas and the Southeast. It has also provided additional facilities for moving live stock from Texas into the Western pasturage territory."

The following table shows the lines to which cars have been ordered from other railroads by the Commission on Car Service:

	No. cars ordered
Alabama, Tennessee & Northern.....	1,012
Alabama & Vicksburg	750
Atlanta, Birmingham & Atlantic.....	1,200
Atlantic Coast Line	4,300
Central of Georgia	800
Chicago Great Western	1,500
Chicago, St. Paul, Minneapolis & Omaha.....	1,500
Cincinnati, Bluffton & Chicago.....	16
Cincinnati, Indianapolis & Western.....	800
Chicago & Alton	700
Chicago, Findlay & Ft. Wayne.....	100
Chicago & Eastern Illinois.....	895
Chicago, Rock Island & Pacific.....	2,000
Carolina, Clinchfield & Ohio.....	200
Delaware & Hudson	48
Georgia	375
Georgia & Florida	200
Gulf Coast Lines	925
Gulf, Mobile & Northern	650
Georgia, Southern & Florida	250
Gulf & Ship Island.....	870
Illinois Central	5,777
International Great Northern.....	159
Kansas City Southern.....	300
Kansas City, Mexico & Orient	300
Louisiana & Arkansas	400
Louisville & Nashville.....	6,737
Louisiana Ry. & Navigation.....	1,400
Meridian & Memphis	250
Missouri, Kansas & Texas.....	1,200
Minneapolis & St. Louis.....	1,500
Missouri Pacific	4,066
Mississippi Central	550
Mobile & Ohio	5,384
Nashville, Chattanooga & St. Louis.....	2,250
New Orleans Great Northern.....	700
Norfolk Southern	1,909
Richmond, Fredericksburg & Potomac.....	100
San Antonio & Aransas Pass.....	250
San Antonio, Uvalde & Gulf.....	185
Seaboard Air Line	1,550
Southern Railway System	2,197
Sunset Central	2,100
St. Louis San Francisco	2,400
St. Louis Southwestern	5,949
Soo Lines	1,400
Texas Mexican	158
Texas Pacific	500
Toledo, Peoria & Western.....	300
Toledo, St. Louis & Western.....	159
Tremont & Gulf.....	100
Union Pacific	300
Vandalia	200
Wabash	500
	68,814

The roads from which the cars were ordered, and the number ordered from each are as follows:

	No. of cars
Acheson, Topeka & Santa Fe.....	100
Ann Arbor	900
Baltimore & Ohio.....	4,900
Boston & Albany	1,550
Boston & Maine	5,692
Chicago & Alton	1,500
Chicago & Eastern Illinois.....	130
Chicago, Burlington & Quincy.....	400
Chesapeake & Ohio	1,600
Central of New Jersey.....	1,950
Cincinnati, Hamilton & Dayton.....	300
Chicago, Milwaukee & St. Paul.....	200
Cleveland, Cincinnati, Chicago & St. Louis.....	45
Colorado & Southern	300
Delaware, Lackawanna & Western.....	1,023
Denver & Rio Grande	300
Erie	1,550
Illinois Central	2,500
Kansas City Southern	100
Lehigh Valley	2,775
Louisville & Nashville.....	450
Michigan Central	2,400
Missouri Pacific	1,000
Missouri, Kansas & Texas.....	100
Mobile & Ohio	200
New York Central	9,163
New York, Chicago & St. Louis.....	2,948
Norfolk & Western	2,754
New York, New Haven & Hartford.....	1,700
Philadelphia & Reading	2,400
Pennsylvania System	18,709
Seaboard Air Line	275
Southern Railway System	2,320
St. Louis San Francisco	50
St. Louis Southwestern	100
Western Maryland	300
	68,814

General News Department

The Baltimore & Ohio is equipping its locomotives with electric headlights at the rate of 75 engines a month. All of the road engines, 2,500 of them, are to have these headlights.

At the last session of the Tennessee legislature a law was enacted which provides that drivers of automobiles shall stop within 50 ft. on approaching all railroad crossings unprotected by watchmen or gates and that they shall also look and listen before proceeding.

The freight house of the New York Central and the Cleveland, Cincinnati, Chicago & St. Louis, at Cleveland, Ohio, was destroyed by fire July 22, together with a great quantity of merchandise. The building was 880 ft. long, 90 ft. wide and two stories high.

The Philadelphia & Reading has made a general advance in the pay of telegraphers, said to be \$5 a month.

Following negotiations with members of shop men's unions on its lines, the Chicago & Eastern Illinois recently granted an increase of 7½ cents an hour to skilled machinists and various other increases to other shop men.

The Chicago & Alton recently granted various increases in wages to its shopmen. They include 7½ cents an hour for skilled mechanics, 6 cents an hour for helpers of the same class, 2½ cents an hour for apprentices, and 3½ cents to 6½ cents to car repair men.

The Chicago, St. Paul, Minneapolis & Omaha, as well as other lines in northwestern territory, recently revised the wage schedules of its machinists and blacksmiths, and is now revising the schedules of various other crafts employed in the mechanical and car department shops. These negotiations have resulted in increases to the men employed in these occupations ranging from 1 cent to 7½ cents an hour.

The Rock Island has made an increase of 10 per cent in the pay of all unorganized employees, to be effective from July 16. It is estimated that between 3,000 and 4,000 employees are affected. An increase has been granted also to the shopmen, the main points of which are as follows: 8½ cents to machinists, boilermakers and blacksmiths; 7 cents to carmen; 7 cents to machinists', sheet metal workers' and carmen's helpers; 7½ cents east of the Missouri river, and 7 cents west of the river to boilermakers' and blacksmiths' helpers and helper apprentices; 2½ cents to boilermaker and blacksmith regular apprentices, and to machinist, sheet metal work and carmen apprentices. The minimum hour-rate for sheet metal workers will be raised to 52 cents, by increases of one cent each month. Monthly rated men in the car department will receive an increase of \$15, and piece workers an increase of 15 per cent. The increases are retroactive from June 1. The eight-hour day is granted from September 1, except for those employees in the car department whose duties are regulated by the transportation department.

In the yards of the Bush Terminal, Brooklyn, N. Y., one day last week, a large number of stenographers and other women and girls from the offices of the Terminal gave demonstrations, before visitors from a number of large corporations, of their ability to do outdoor work, such as running locomotives and electric motors, managing derricks and other apparatus, and directing the transfer of freight.

To preserve the pension rights of employees of the Chicago & North Western entering military service, R. H. Ashton, president, has issued instructions requiring the head of each department to advise the secretary of the pension board of the names of employees entering the service, together with their positions and the dates when they leave railroad service. When a former employee is discharged from military service and returns to the railroad the head of his department will be required to advise

the secretary of the pension board promptly of the absentee's name, the date of his re-entering the service, and the position he holds.

The Pennsylvania Railroad has decided to suspend, temporarily, the regulation covering the age limit for employment. The rule heretofore in force prohibited the hiring of new employees, in any branch of the service, above the age of 45 years. Under the new rule, which has been adopted to meet war conditions, persons between the ages of 45 and 70 years may be employed during the war and for a period of six months thereafter. Such employment is not to be considered permanent, and it will not carry with it the privileges of the pension department. Numbers of former employees have already been taken into the service.

The Thirtieth Engineers (Railways), United States Army, has moved to the Atlantic seaboard on its way to France. Two companies started on July 18, and the remainder of the contingent on July 21. All of the nine railway regiments organized under the direction of S. M. Felton, president of the Chicago Great Western, were recently renamed and renumbered, ten having been added to each of the former numbers. For example, the regiment until recently stationed at Chicago and formerly known as the Third Reserve Engineers, is now the Thirtieth Engineers (Railways), United States Army. Before leaving their quarters on the Municipal pier at Chicago, the Thirtieth Engineers (Railways), United States Army, were presented with regimental colors by S. M. Felton, president of the Chicago Great Western, and C. H. Markham, president of the Illinois Central.

The Baltimore & Ohio, looking to the highest fitness for the war, has inaugurated a campaign to improve the sanitary and hygienic condition of its employees. Dr. E. M. Parlett, medical officer of the railroad's welfare bureau, has addressed a communication to employees, urging them to devote particular attention to sanitary conditions in their homes and communities. He says: "The water supply, sewage and garbage disposal, milk inspection, fly and mosquito extermination, overcrowding in the home and like subjects in every community are matters of vital concern. We cannot hope to curtail tuberculosis, malaria, typhoid, pneumonia, intestinal diseases, etc., among our employees unless all communities, and our own shops, properties and equipment are maintained to a high standard of sanitation, coupled with the knowledge and practice of personal hygiene on the part of our employees. . . . Make it your duty to become acquainted with the members of your local and state boards of health; become alive to your opportunities for the protection of your own and your family's health and life."

Don't Be a Slacker

O. C. Castle, superintendent of car service of the Southern Pacific Lines in Texas and Louisiana, recently issued an appeal to officers and employees of his road to conserve the car supply. His circular is entitled "Don't Be a Slacker" and reads in part: "The man who is obligated to bear arms, but who shirks his duty is called a 'slacker.' This term may now appropriately be applied to a man who neglects any act which may increase the efficiency of a freight car. The 'spirit of '76'; the heroism and sacrifice of '61, and the spectacular achievements of '98 will not win the present war. Neither will the car performance of last year and last month meet the crisis that confronts us today. A new goal must be set. All precedents which hamper efficiency must be brushed aside and new methods evolved. Pointed appeals have been made to shippers; national and state commissions have approved increases in demurrage charges, and business associations throughout the country are organizing campaigns for improved handling by the public. These, however, must be supplemented by individual action. It is, therefore, the patriotic duty of every officer and employee to check freight car waste.

Do not regret the fact that circumstances prevent you from serving with armed forces on land or sea. You can render just as valuable service by doing your *individual* duty in conserving freight car energy. By the extent that you perform this duty your patriotism will be gaged. If you fail in this duty, you will be a slacker. *Don't Be a Slacker!*"

Lucky "13"

W. E. Johnston, excursion agent of the Washington-Sunset route of the Southern Pacific, has made 938 trips between San Francisco, Cal., and Washington, D. C., covering a period of 17 years and 8 months. He left on Friday 496 times. Moreover, he made one round trip every 13 days, and 13 round trips every 6 months. The total mileage covered during the above period was 3,404,102 miles. Assuming an average of 20 passengers on each trip, Mr. Johnston has accompanied 18,760 passengers across the continent.

Samuel M. Felton Appointed Director-General of Railways

Samuel M. Felton, president of the Chicago Great Western and heretofore adviser to General Black, chief of engineers of the United States army, has been appointed by the Secretary of War director general of railways, with office at Washington, D. C. According to the order announcing his appointment, Mr. Felton is charged under the chief of engineers with the organization and despatch abroad of all railway forces and the purchase of all railway material, both for initial action and for continuous supplies for operation. Mr. Felton has been in charge of the organization of the railway engineer regiments for service abroad, as previously described in the *Railway Age Gazette*, or more particularly in the Patriotic War Number of June 22, page 1274.

New Laws

The legislature of Connecticut has passed a law authorizing railways to clear the brush off from unimproved lands adjacent to their rights of way within 100 ft. of the track. This right must be exercised under the direction of the State Forest Fire Warden, and, under suitable restrictions, inflammable substances may be burnt on the premises under the supervision of the town fire warden.

The legislature of Idaho has passed a law requiring railroads to destroy weeds on their rights of way in accordance with orders issued by officers of the state or county. Another law in Idaho empowers the Public Utilities Commission, on receipt of a complaint and after hearing, to order gates, flagmen or automatic bells at highway crossings.

Appeal for Better Handling of Foreign Cars

E. E. Betts, superintendent of transportation of the Chicago & North Western, has sent a circular letter to all superintendents of the system, calling attention to the loss in time and money resulting from unnecessary delay in the handling of foreign cars. He said in part:

"Our standing instructions provide that any car on which home routing or disposition is desired must be reported when the car arrives at any station or in any yard under load, in order that billing may be in the possession of the proper employee before the car is empty and ready to move. Notwithstanding these instructions . . . about half the time the cars are held at a station until they are empty and ready to move, and then the disposition or home routing is requested. Where this course is pursued the cars are almost invariably delayed one day, which is equal to 60 cents now, and frequently two days, or \$1.20, to say nothing of the loss of utility of the car, which now, and for some time to come, equals at least five dollars a day.

"In the modern game of baseball every player has got to know what to do with the ball before he gets it. If after the ball is in his possession he has to run over to the captain and find out what to do with it, the game will be lost; and any player who would attempt to play the game in this manner would be immediately relegated to the bush league. The handling of foreign cars is not dissimilar. Every player in the game has got to know what to do with the car when it is ready to move."

Railway Revenues for May

The Interstate Commerce Commission has issued its monthly summary of reports of large roads for May, 1917, covering 230,905 operated miles. Railway operating revenues for the month amounted to \$346,775,079, as compared with \$301,045,712 in May, 1916. Operating expenses increased from \$197,410,491 in May, 1916, to \$238,682,279, and the operating income increased from \$90,931,795 to \$92,079,548. For five months of the year operating revenues show an increase from \$1,396,680,987 to \$1,548,033,610. Expenses increased from \$950,606,609 to \$1,118,191,720. Taxes increased from \$62,568,543 to \$72,332,167, and railway operating income was \$357,258,663, or \$1,547 per mile, as compared with \$383,213,498, or \$1,664 per mile in May, 1916. For the five months both the southern and western districts show an increase in operating income, the decrease being attributable to the eastern roads.

A Freight Conductor's Experience

A careful watch of your train, and a proper attention to hot boxes at the right time, will avoid the renewal of brasses to such an extent that the saving will run up into the thousands of dollars. In my 27 years' experience I have found that nineteen times out of twenty, a hot box can be properly cared for in less time than it takes to set the car out, and by giving box attention at usual stopping places, you will be able to get journal to a bearing again. In addition to saving brasses, you are saving delays to freight, and possibly have kept future shipments from consignor from being routed over some other line. Suppose you set out, fifty miles from your terminal, a 70-ton car of coal, you have lost for your engine 50 times 70, or 3,500 ton miles. Take a system like the Illinois Central and you can readily see what a daily loss of earning power of locomotives may occur from hot boxes.—G. S. Rought, conductor, Illinois Central.

War Supplies Handled Promptly

The War Department has authorized the statement that not a hitch has developed in getting supplies to the five divisions of the National Guard called into federal service on July 15, and that each depot quartermaster who had a division to provide for had everything needed by the men before they left for the southern camps where they are to train. The supplies for each depot were ordered two weeks in advance, and each depot quartermaster was instructed to report failure of any portion of his consignment to arrive. No such reports were received, with the exception of a small shipment which had not been started. For the shorter distances supplies were delivered by auto truck, but the guard of Ohio and West Virginia were supplied from Jeffersonville, Ind.; the Michigan and Wisconsin divisions from Chicago and the division made up of the units of Minnesota, Iowa, North and South Dakota and Nebraska was supplied from Omaha by rail. The date when the troops from the several states shall actually begin to move to the southern camps has been left to the department commanders. The second increment of the National Guard to be called into federal service was mobilized on July 25.

How Alabama Great Southern Won Safety Medal

The June Safety Bulletin of the American Museum of Safety contains an article outlining the safety provisions which won for the Alabama Great Southern the E. H. Harriman memorial gold medal. The record for this road during 1916 showed not one passenger killed, no employees killed in train accidents, only one fatality in other than a train accident, and no fatalities and only two injuries among 2,000 industrial workers employed by the company. The number of adverse marks charged against the Alabama Great Southern based on the number of locomotive miles run, the tons of freight and the number of passengers carried one mile during the year was 39.76, as compared with 112.30, the next best accident record submitted in the competition.

The bulletin says that "the entire line from Chattanooga, Tenn., to Meridian, Miss., 309 miles, is equipped with automatic block signals, furnishing protection both to following and to opposing trains. Interlocking plants are installed at railroad

crossings and junction points with other roads, at the ends of double track and at draw-bridges over the Warrior and Tombigbee rivers. Grade crossings at important places have been eliminated, and other highway crossings at grade are protected by gates, bell signals or by watchmen. Bridges and trestles are equipped with foot walks and safety stations for the protection of employees, who must use them. Telephones have been installed at the ends of tunnels for the protection of men who must pass through on handcars. Curves are being systematically eliminated or reduced, and obstructions to view at highway crossings have been removed. Frequent surprise tests are made by local officers to determine the observance of signal indications and the action taken by employees in train, engine and yard service. Daily inspections of track, bridges and other structures are made by section foremen and track walkers, and less frequent periodical inspections are made by higher officers. Before employment or promotion employees are required to pass exacting physical and mental tests. Standard safety devices have been installed in shops and yards, and on cars and engines. Although safety rules are rigidly enforced, in the past few years the extreme penalty of dismissal for their violation has been unnecessary except in a few cases. Safety committees have been organized among the employees, the personnel of which is changed at frequent intervals so that all of the employees of the various departments may have an opportunity to serve. All the company's buildings and passenger cars are equipped with sanitary conveniences of the best modern type, which are maintained in a condition of scrupulous cleanliness."

The Government Railroad in Alaska

The importance of the early completion of the government railroad in Alaska in helping the United States to meet the burdens of war is set forth in a statement issued by the Secretary of the Interior. The railroad, it is pointed out, will hasten the development of Alaska's vast resources; will encourage the production of foodstuffs, thus reducing the territory's dependence upon the United States for supplies; will furnish coal in unlimited quantity for the navy, obviating the necessity for the transcontinental shipment to the Pacific of fuel for government vessels, and thus release thousands of cars for the transportation of war materials and foodstuffs.

The main line of the road is now under construction from Seward, on the Pacific Coast, inland for 470 miles to Fairbanks, on the Tanana river, a large and navigable tributary of the Yukon. There is now in operation 150 miles.

The road taps two large coal fields, the Matanuska and the Nenana. The coal in the Matanuska field has been tested by the navy and found to be excellent for steaming purposes. The Nenana coal was recently tested by the Bureau of Mines and found to be a fair grade of lignite. It is estimated that the supply in both of these fields is practically inexhaustible. By September of this year the branch will be completed to the Matanuska coal field. Dredging is under way at Anchorage, the nearest tidewater port to the coal fields, in order that deep-draft ocean vessels may be loaded at the docks. When the gap, about 25 miles in length, along Turnagain Arm, between Anchorage and Seward, is completed, coal can be shipped from the latter port. It is planned to close this gap early in 1918.

Coal mined from the Matanuska field is now being used in the construction of the railroad. Construction work is being pushed as rapidly as possible, and it is estimated that at the present rate Matanuska coal can be delivered for the needs of the navy and for general use on the Pacific Coast in the early summer of 1918.

The railroad is also being constructed southward from Fairbanks to tap the Nenana field, making the coal here available for the development of such mineral deposits as copper, antimony and gold in this part of the country. Mining here is practically at a standstill, owing to the lack of suitable fuel. The Nenana coal will also be made available for use on the railroad locomotives and on the river steamers of the interior.

The railroad traverses several rich agricultural valleys, the development of which will supply Alaska's needs and obviate the necessity of making shipments of food products from the states. Along the many streams adjacent to the railroad is found a plentiful supply of cottonwood and spruce, from which pulp for paper making can be derived.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

- AMERICAN ASSOCIATION OF DINING CAR SUPERINTENDENTS.—H. C. Boardman, Di. L. & W., Hoboken, N. J. Next convention, to have been held October 22-24, 1917, San Francisco, Cal., indefinitely postponed.
- AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. of N. J., 143 Liberty St., New York. Next meeting, October 16-17, St. Louis.
- AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichtig, C. & N. W., Chicago. Next convention, October 16-18, 1917, St. Paul, Minn.
- AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Watten Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 2:30 W. 57th St., New York.
- ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—W. L. Connelly, Supt. of Telegraph, Indiana Harbor Belt, Gibson, Ind. Next annual meeting to have been held September 18, 1917, Washington, D. C., indefinitely postponed.
- CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.
- CANADIAN SOCIETY OF CIVIL ENGINEERS.—Eugene H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.
- CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 1st and 3d Tuesday in month, except June, July and August, Hotel L. Salle, Chicago.
- CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.
- CHIEF INTERCHANGE CAR INSPECTORS AND CAR FOREMEN'S ASSOCIATION.—W. R. McMunn, New York Central, Albany, N. Y. Next convention, September, 1917, St. Louis.
- CINCINNATI RAILWAY CLUB.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 1000 College Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Statler, Cincinnati.
- ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 568 Union Arcade Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.
- GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.
- INVESTMENT BANKERS' ASSOCIATION OF AMERICA.—Frederick R. Fenton, 11 W. Monroe St., Chicago. Annual convention, October 1-3, 1917, Baltimore, Md.
- MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 16-18, 1917, Cleveland, Ohio.
- NATIONAL ASSOCIATION OF RAILWAY COMMISSIONERS.—Jas. B. Walker, 120 Broadway, New York City. Next annual convention, October 16, 1917, Washington, D. C.
- NEW ENGLAND RAILWAY CLUB.—W. E. Cade Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.
- NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.
- NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Geo. A. J. Hinchgrebe, 623 Bridge Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.
- PACIFIC RAILWAY CLUB.—W. S. Wells, Assistant to Chief Engineer, Northwestern Pacific R. R., San Francisco, Cal.
- PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria, Ill.
- RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.
- RAILWAY CLUB OF PITTSBURGH.—J. R. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial Annex Hotel, Pittsburgh.
- RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, office of the president's assistant, Seaboard Air Line, Norfolk, Va. Next meeting, October 24, 1917, St. Louis, Mo.
- RAILWAY REAL ESTATE ASSOCIATION.—R. H. Morrison, Assistant Engineer, C. & O. Richmond, Va. Next convention, October, 1917, Duluth, Minn.
- RAILWAY SIGNAL ASSOCIATION.—C. C. Roehrig, Myers Bldg., Bethlehem, Pa. Next annual convention, September, 1917, Atlantic City, N. J.
- RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O. Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.
- ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September 18-21, 1917, Hotel Auditorium, Chicago.
- ST. LOUIS RAILWAY CLUB.—R. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.
- SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.
- SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday in January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta, Ga.
- TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.
- TRAFFIC CLUB OF NEW YORK.—C. A. Swone, 291 Broadway, New York. Regular meetings, 2d Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.
- TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Gen'l Ag't, Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings bi-monthly, Pittsburgh.
- TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio. Next convention, September, 1917, New York.
- UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.
- WESTERN CANADA RAILWAY CLUB.—L. K. Kim, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.
- WESTERN RAILWAY CLUB.—I. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 1st Monday in month, except June, July and August, Hotel Sherman, Chicago.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF MAY, 1917

Operating expenses—

Name of road.	Average mileage operated.	Operating revenues			Maintenance of way and equipment			Operating expenses—			Net income from operation.	Railway accruals.	Operating (or decr.) in last year.
		Freight.	Passenger.	(Inc. misc.)	W.	E.	M.	Traffic.	Transportation.	Miscellaneous.			
Alabama Great Southern.....	312	\$102,916	\$131,575	\$579,977	\$66,069	\$116,910	\$17,746	\$175,831	\$125,833	\$8,987	\$390,447	\$21,457	\$169,917
Atlantic City.....	310	8,025,916	128,902	255,411	31,339	122,685	711	122,685	74,452	10,450	189,359	18,452	18,635
Central Vermont.....	411	272,615	70,934	388,932	45,705	55,986	8,143	8,143	207,855	1,077	60,636	15,565	44,574
Chester, Burlington & Quincy.....	9,373	7,966,854	1,790,373	10,757,229	1,497,913	1,575,977	156,267	3,327,552	3,489,267	7,083,593	3,489,267	3,489,267	540,327
Cincinnati, New Orleans & Texas Pacific.....	331	318,587	218,879	1,105,658	88,674	303,321	31,500	324,756	777,357	18,516	777,357	46,360	37,399
Duluth, Winnipeg & Pacific.....	191	188,566	19,440	181,651	23,624	22,260	3,567	74,928	74,928	6,974	131,353	9,083	4,905
Eastern Southern & Florida.....	402	132,366	56,578	218,019	29,022	54,435	8,429	52,133	186,229	1,811	31,790	20,260	8,131
Georgia, Oklahoma & Gulf of Texas.....	134	22,563	31,105	29,411	2,009	2,009	1,867	9,252	17,650	1,582	5,455	18,184	8,901
New Orleans & North Eastern.....	204	284,800	74,057	401,421	33,712	70,453	10,688	131,868	6,884	10,369	264,174	137,247	9,833
Philadelphia & Reading.....	1,137	4,851,867	625,431	5,829,189	366,434	1,019,632	52,827	2,370,775	14,030	100,601	3,922,338	137,930	176,387
Port Reading.....	21	152,773	7,692	171,727	6,942	7,082	39	84,459	1,644	1,100,611	71,216	10,000	67,113
St. Louis, Iron Mountain & Southern.....	3,539	2,947,288	371,759	3,849,055	562,512	591,117	87,337	1,028,703	12,109	78,606	2,344,174	150,481	1,333,128
St. Louis, Merchants' Bridge Terminal.....	9	.....	274,297	274,297	30,871	13,784	.....	123,443	6,981	176,034	98,263	7,517	90,746
St. Louis-San Francisco.....	4,752	3,161,916	1,132,103	4,385,684	536,040	678,375	67,850	1,577,840	.....	17,747	2,962,852	187,324	1,434,402
St. Louis Southern.....	244	68,964	26,757	105,491	21,513	15,913	2,202	59,075	.....	5,583	104,287	1,491	287
St. Louis Southwestern & Texas.....	436	736,821	185,907	925,747	72,227	161,893	32,130	211,441	2,133	26,488	506,398	419,350	372,228
St. Louis Southern & Texas.....	436	736,821	185,907	925,747	72,227	161,893	32,130	211,441	2,133	26,488	506,398	419,350	372,228
Seaboard.....	736	226,150	70,558	320,213	64,642	12,876	7,479	163,921	1,164	13,756	332,065	18,142	6,388
Southern.....	3,461	1,834,694	435,242	2,506,336	241,767	482,232	73,486	906,652	13,109	72,440	1,785,409	112,500	32,955
Southern in Mississippi.....	6,281	5,059,624	1,538,637	7,733,192	714,094	1,238,367	180,617	2,532,019	44,877	172,093	4,838,291	319,286	2,112,747
Southern Pacific.....	7,096	8,434,306	2,505,318	12,079,630	1,101,459	1,518,603	172,809	3,974,803	17,672	285,778	4,869,124	55,053	4,343,468
Spokane, Portland & Seattle.....	555	120,577	52,787	73,221	45,862	7,507	142,103	4,757	13,050	286,257	287,530	58,300	229,150
Tennessee Central.....	37	121,079	33,456	163,826	22,750	26,756	5,345	59,629	.....	6,437	120,917	4,800	38,104
Terminal R. R. Ass'n. of St. Louis.....	35	.....	472	309,558	29,398	20,696	1,010	97,369	1,752	3,636	153,860	155,698	37,667
Texas & New Orleans.....	468	357,964	118,060	507,632	39,501	78,518	9,246	148,398	3,701	11,034	289,991	217,641	21,327
Texas & Pacific.....	1,468	1,278,158	51,034	1,465,796	100,746	120,849	4,456	224,107	1,384	12,656	659,067	25,000	552,281
Toledo & Ohio Central.....	248	68,403	34,268	109,122	18,924	28,815	2,867	41,337	.....	5,188	97,113	12,009	3,549
Toledo, Peoria & Western.....	455	530,400	34,490	591,514	94,964	92,971	18,595	212,746	.....	10,570	419,631	20,000	151,355
Toledo, St. Louis & Western.....	350	60,169	8,881	80,283	21,364	27,522	1,856	27,522	.....	3,534	71,418	16,865	4,400
Trenton & Delaware.....	129	52,047	16,588	88,283	10,650	11,432	2,424	43,002	.....	376	71,418	16,865	4,400
Union Pacific.....	3,622	4,796,061	1,025,584	6,808,678	961,430	782,817	126,580	1,634,511	126,941	185,646	3,771,160	2,637,518	455,600
Union R. R. of Baltimore.....	8	154,970	32,582	189,849	12,713	16,631	.....	7,474	2,280	22,467	167,382	10,086	157,295
Union R. R. of Penna.....	35	.....	497,109	86,237	164,631	.....	.....	253,043	5,649	509,861	12,751	7,335	20,085
Vicksburg, Shreveport & Pacific.....	513	91,639	43,346	152,884	17,873	30,613	5,215	52,406	1,867	6,119	114,093	38,791	9,900
Virginian.....	907	97,473	37,279	99,697	67,739	141,039	6,209	250,695	17,746	15,303	502,021	49,896	455,872
Wabash.....	2,519	2,629,571	597,446	3,515,967	365,922	400,866	86,665	1,441,697	19,743	77,772	2,391,473	112,494	105,199
Washington Southern.....	381	81,504	24,021	14,039	24,021	1,541	3,858	108,411	96,303	67,859	108,411	96,303	67,859
West Jersey & Seashore.....	359	236,904	337,049	631,548	110,940	103,934	10,272	239,588	4,538	17,828	487,186	144,362	103,190
Western Maryland.....	175	910,160	80,394	1,060,220	120,679	236,571	23,525	403,771	10,830	29,527	853,367	36,590	198,353
Western Railway of Alabama.....	133	65,225	41,033	118,673	15,283	28,520	7,337	39,980	2,075	4,796	97,984	6,150	14,527
Western Pacific.....	958	757,535	125,929	913,609	149,929	177,572	20,491	237,368	12,051	20,037	501,770	41,839	36,279
Wilmington & Annapolis.....	132	1,211,813	237,796	1,455,763	231,795	238,785	21,035	433,431	2,452	5,416	1,211,813	136,611	136,611
Yazoo & Mississippi Valley.....	1,342	1,121,813	237,796	1,455,763	231,795	238,785	21,035	433,431	2,452	5,416	1,211,813	136,611	136,611
Alabama & Vicksburg.....	143	\$542,872	\$75,636	\$793,383	\$101,901	\$148,201	\$277,432	\$197	\$321,140	\$591,337	\$202,046	\$49,700	\$152,346
Alabama Great Southern.....	312	1,847,487	578,970	2,441,455	335,142	543,460	85,860	808,040	14,700	55,538	1,832,740	101,575	706,229
Atlantic City.....	310	8,025,916	128,902	255,411	31,339	122,685	711	122,685	74,452	10,450	189,359	18,452	18,635
Atlantic City & Eastern.....	378	1,607,008	295,306	1,902,314	244,234	214,683	27,500	575,733	43,812	252,398	1,650,500	186,779	90,433
Atlantic Coast & Santa Fe.....	8,648	39,254,355	11,792,461	55,382,753	5,737,623	9,521,060	973,269	12,465,120	111,791	1,129,131	34,700,757	2,497,922	18,075,627
Atlanta & West Point.....	33	345,188	33,613	369,471	27,062	16,681	3,523	222,384	24,971	484,241	180,529	36,275	144,111
Atlantic & Birmingham.....	93	125,088	93,101	169,471	16,681	16,681	159	35,263	35,263	1,003,165	199,096	53,405	422,694
Atlantic & St. Lawrence.....	167	332,989	131,414	804,065	203,154	134,278	21,465	600,103	477	3,533	788,860	101,301	50,000
Atlantic City.....	170	419,652	413,968	890,161	125,500	98,965	16,479	544,286	3,373	40,490	12,036,499	6,707,938	35,373
Atlantic Coast Line.....	4,776	12,271,104	4,903,574	18,744,434	2,627,183	2,879,457	332,979	6,314,271	93,823	402,490	12,036,499	9,020,000	5,800,917
Baltimore & Ohio.....	4,545	39,321,805	6,317,438	49,897,573	9,942,995	9,942,995	955,092	20,464,327	340,085	1,247,612	38,319,970	11,577,603	9,886,646
Baltimore & Ohio Chicago Terminal.....	79	.....	3,271	802,363	74,721	152,131	7,739	586,673	73,083	33,684	827,737	115,630	172,015
Baltimore & Chesapeake & Atlantic.....	4,947	341,021	97,644	357,051	34,887	62,816	6,029	228,164	.....	13,140	345,029	11,798	14,855
Baltimore & Delaware.....	631	1,680,302	300,132	2,045,434	241,400	241,400	16,000	2,006,99	.....	3,045	1,680,302	65,623	40,395
Belt Ry. Co. of Chicago.....	81	1,464,628	107,225	2,24,652	7,029	763,202	.....	.....	.....	94,054	1,186,160	38,760	39,610

FIVE MONTHS OF CALENDAR YEAR, 1917

REVENUES AND EXPENSES OF RAILWAYS

FIVE MONTHS OF CALENDAR YEAR 1917—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues—			Operating expenses—			General.	Total.	Net railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decrease) last year.
		Freight.	Passenger.	Total (inc. misc.).	Maintenance of way and structures.	Equip-ment.	Traffic.	Trans-portion.					
Bessemer & Lake Erie.....	205	\$3,168,406	\$132,337	\$3,300,743	\$398,086	\$1,184,599	\$52,617	\$1,245,695	\$81,284	\$2,913,314	\$487,233	\$376,781	—\$94,182
Birmingham & Gulf.....	36	1,169,784	27,113	1,196,897	114,223	147,963	6,117	190,585	17,372	476,446	741,530	653,861	—\$92,584
Birmingham Southern.....	36	1,169,784	27,113	1,196,897	114,223	147,963	6,117	190,585	17,372	476,446	741,530	653,861	—\$92,584
Buffalo & Susquehanna R. R. Corporation.....	236	4,133,707	6,301,327	10,435,034	2,800,000	3,462,983	16,920	2,866,983	50,810	18,200,000	14,220	12,027	—68,315
Buffalo & Susquehanna R. R. Corporation.....	233	4,133,707	6,301,327	10,435,034	2,800,000	3,462,983	16,920	2,866,983	50,810	18,200,000	14,220	12,027	—68,315
Buffalo, Rochester & Pittsburgh.....	587	4,278,041	493,123	4,771,164	538,608	1,451,414	79,939	2,245,010	7,045	139,721	4,461,686	827,512	—428,959
Canadian Pacific Lines in Maine.....	234	1,224,006	104,697	1,328,703	121,624	183,710	29,839	597,738	.....	26,270	958,487	490,920	61,006
Carroll, Winchester & Ohio.....	283	1,485,585	102,092	1,587,677	160,463	252,920	82,472	365,380	.....	64,137	933,780	67,020	53,377
Central of Georgia.....	1,919	3,872,293	1,385,376	5,257,669	875,974	1,052,284	202,691	2,005,947	11,136	20,437	3,315,630	1,400,066	138,422
Central of New Jersey.....	684	10,231,218	2,386,556	14,617,774	1,185,306	2,755,597	140,633	5,758,710	82,591	394,378	10,065,239	1,199,697	79,074
Central New England.....	301	1,059,904	142,621	1,202,525	174,362	221,540	5,406	798,011	2,179	39,427	1,440,279	773,375	23,627
Central Vermont.....	301	1,059,904	142,621	1,202,525	174,362	221,540	5,406	798,011	2,179	39,427	1,440,279	773,375	23,627
Chesapeake & Ohio Lines.....	2,380	17,252,299	2,722,699	20,000,000	1,401,964	2,401,964	264,869	7,305,455	133,384	45,244	15,531,763	6,501,783	208,450
Chicago & Alton.....	1,053	5,695,951	1,643,623	7,339,574	796,346	1,077,634	192,343	2,927,619	54,358	193,983	5,709,404	1,199,970	267,710
Chicago & Eastern Illinois.....	1,131	6,275,011	1,299,466	7,574,477	892,203	1,260,388	138,039	3,169,678	52,046	193,983	6,485,317	1,764,167	328,500
Chicago & Erie.....	270	2,028,137	216,577	2,244,714	278,112	442,020	92,149	1,588,975	15,217	97,841	3,003,935	958,107	215,000
Chicago & North Western.....	876	10,231,218	2,386,556	14,617,774	1,185,306	2,755,597	140,633	5,758,710	82,591	394,378	10,065,239	1,199,697	79,074
Chicago, Burlington & Quincy.....	9,733	34,978,721	8,690,787	43,669,508	5,105,191	7,821,333	250,383	15,888,952	366,722	978,641	30,053,935	9,581,207	1,215,000
Chicago, Great Western & St. Louis.....	3,315	6,000,000	1,500,000	7,500,000	1,000,000	1,500,000	200,000	3,000,000	400,000	400,000	6,600,000	1,500,000	200,000
Chicago, Great Western & St. Louis.....	3,315	6,000,000	1,500,000	7,500,000	1,000,000	1,500,000	200,000	3,000,000	400,000	400,000	6,600,000	1,500,000	200,000
Chicago, Indianapolis & Louisville.....	1,496	4,472,688	1,359,117	5,831,805	830,002	1,178,882	226,753	2,605,777	57,994	227,741	5,119,242	1,257,764	254,000
Chicago, Milwaukee & St. Paul.....	10,355	25,966,585	7,412,360	33,378,945	3,441,773	6,472,992	704,227	13,655,624	2,503	93,362	25,517,397	1,127,807	181,160
Chicago, Peoria & St. Louis.....	255	7,120,351	109,937	7,230,288	1,014,778	1,716,403	29,990	3,651,523	61,048	85,547	7,146,071	2,822,292	8,155,491
Chicago, Rock Island & Gulf.....	477	1,120,351	133,000	1,253,351	225,692	315,692	50,595	521,083	.....	46,161	1,055,000	473,083	43,956
Chicago, Rock Island & Pacific.....	7,656	22,952,864	7,753,121	30,705,985	4,305,970	6,861,165	686,165	12,987,056	270,213	830,684	23,333,629	8,041,468	1,570,734
Chicago, St. Paul, Minneapolis & Northern Pacific.....	1,735	5,485,721	2,034,149	7,519,870	996,003	1,400,448	144,302	3,406,962	79,316	233,981	5,946,674	1,129,852	1,467,315
Chicago, St. Paul, Minneapolis & Northern Pacific.....	1,735	5,485,721	2,034,149	7,519,870	996,003	1,400,448	144,302	3,406,962	79,316	233,981	5,946,674	1,129,852	1,467,315
Cincinnati, Hamilton & Dayton.....	575	3,589,880	477,566	4,067,446	490,693	877,456	36,220	485,369	1,502	117,970	3,851,910	532,217	170,469
Cincinnati, Indianapolis & Western.....	322	3,800,823	208,166	4,008,989	129,244	181,383	36,220	485,369	1,502	117,970	3,851,910	532,217	170,469
Cincinnati, New Orleans & Texas Pacific.....	337	3,694,739	110,841	3,805,580	449,122	1,203,645	150,939	1,633,692	44,012	96,490	3,576,400	1,589,636	205,900
Cincinnati Northern.....	246	7,744,051	69,625	7,813,676	881,840	1,367,209	15,350	3,772,635	16,428	713,424	16,841,616	3,840,033	39,025
Cincinnati, Cincinnati, Chic. & St. Louis.....	2,307	14,128,325	4,145,660	18,273,985	2,086,011	3,811,788	408,316	8,472,522	128,784	435,193	14,977,821	5,108,280	4,304,327
Cal & Col.....	338	426,111	51,755	477,866	82,161	155,223	3,691	214,389	1,106	14,245	461,304	1,067	23,072
Colorado & Southern.....	1,103	3,263,098	610,338	3,873,436	419,619	715,800	53,597	1,295,644	23,038	129,446	2,636,216	1,536,564	224,737
Colorado & Wyoming.....	43	166,465	11,947	178,412	38,659	71,942	7,514	163,445	.....	18,835	293,094	20,332	16,470
Cripple Creek & Colorado Springs.....	87	443,454	50,095	493,549	47,467	60,818	7,242	133,257	.....	16,602	255,383	288,115	.....
Delaware & Hudson Co.—R. R. Dept.....	879	9,655,711	1,041,485	10,697,196	1,133,662	1,621,129	21,825	586,273	4,003	49,373	9,911,602	1,834,158	124,493
Delaware, Lackawanna & Western.....	955	16,744,743	3,377,014	20,121,757	2,108,314	3,869,030	375,741	8,037,808	188,582	435,681	14,592,700	7,802,035	1,270,330
Denver & Rio Grande.....	2,578	8,850,994	1,118,251	9,969,245	1,178,251	2,025,430	199,979	3,573,803	125,515	330,962	7,444,372	3,693,843	271,966
Denver & Salt Lake.....	255	580,445	102,132	682,577	148,760	220,923	10,471	400,057	.....	25,936	806,147	41,250	320,422
Detroit & Toledo Shore Line.....	381	579,912	125,294	705,206	52,604	118,204	10,286	198,754	.....	18,543	461,304	1,067	23,072
Detroit & Toledo Shore Line.....	381	579,912	125,294	705,206	52,604	118,204	10,286	198,754	.....	18,543	461,304	1,067	23,072
Detroit, Grand Haven & Milwaukee.....	191	935,000	207,500	1,142,500	168,196	203,353	26,440	635,373	.....	34,253	1,135,722	43,534	.....
Detroit, Toledo & Iron Range.....	270	1,144,587	104,895	1,249,482	149,427	214,401	21,401	635,373	.....	34,253	1,135,722	43,534	.....
Duluth & Iron Range.....	270	1,144,587	104,895	1,249,482	149,427	214,401	21,401	635,373	.....	34,253	1,135,722	43,534	.....
Duluth, Missabe & Northern.....	410	1,220,594	104,895	1,325,489	204,959	344,318	16,291	667,380	6,542	135,449	2,075,140	44,884	.....
Duluth, Winnipeg & Pacific.....	191	842,314	126,879	969,193	109,350	176,414	11,489	335,318	.....	104,687	1,359,207	296,389	50,000
Elgin, Joliet & Eastern.....	801	5,729,446	100	5,730,000	574,444	1,799,127	40,187	2,233,007	.....	104,687	1,359,207	296,389	50,000
El Paso & Southwestern Co.....	1,028	4,800,695	977,821	5,778,516	686,067	1,040,738	104,738	1,581,087	35,812	138,579	3,074,512	2,819,991	8,334,916
El Paso & Southwestern Co.....	1,028	4,800,695	977,821	5,778,516	686,067	1,040,738	104,738	1,581,087	35,812	138,579	3,074,512	2,819,991	8,334,916
Florida East Coast.....	1,988	20,636,053	3,678,359	24,314,412	2,229,475	3,911,494	464,257	12,755,137	179,219	634,550	23,240,669	3,955,384	4,459,406
Fort Worth & Denver City.....	454	1,564,394	1,564,394	3,128,788	498,348	1,170,197	37,319	1,970,197	35,388	81,600	1,880,535	2,330,442	1,098
Fort Worth, Harrisburg & San Antonio.....	1,361	5,644,449	1,004,943	6,649,392	1,004,943	1,604,937	173,503	2,608,967	61,863	199,098	5,088,096	2,901,948	1,819,524
Galveston Wharf.....	147	984,402	358,756	1,343,158	6,652	6,652	1,427	160,353	115,951	3,421	233,964	234,730	52,500
Georgia Southern & Florida.....	307	984,402	358,756	1,343,158	6,652	6,652	1,427	160,353	115,951	3,421	233,964	234,730	52,500
Grand Rapids & Indiana.....	575	1,253,246	55,598	1,308,844	160,005	239,024	37,630	427,589	5,154	47,503	917,485	20,668	171,394
Grand Rapids Western.....	347	2,886,200	578,000	3,464,200	401,155	604,312	89,423	1,270,589	2,229	97,476	2,453,881	372,611	133,799
Great Northern.....	8,197	22,698,501	5,627,222	28,325,723	4,491,457	4,990,109	534,455	11,815,991	419,456	593,985	23,002,371	8,410,019	166,175
Gulf & Ship Island.....	308	607,069	144,238	751,307	118,935	121,480	16,169	255,060	1,639	40,136	552,945	290,704	217,398
Gulf, Colorado & Santa Fe.....	1,937	5,966,963	1,150,546	7,117,509	6,646,131	1,022,197	150,710	2,277,122	.....	291,605	5,003,067	1,643,064	297,413
Hackensack Valley.....	130	946,063	121,424	1,067,487	136,451	136,451	20,049	273,540	38	41,257	591,561	245,752	42,104
Houston & Texas Central.....	918	2,133,345	630,285	2,763,630	437,118	808,230	87,443	994,706	23,330	93,375	2,650,422	1,083,161	203,648
Houston, East & West Texas.....	191	556,659	144,264	700,923	83,557	110,332	15,032	245,887	.....	16,016	499,390	301,009	33,148

REVENUES AND EXPENSES OF RAILWAYS

FIVE MONTHS OF CALENDAR YEAR 1917—Continued

Name of road.	Average mileage operated during year.	Operating revenues—(Total)			Operating expenses—			Net operating revenue.	Railway operating accruals.	Increase (or decrease) from last year.
		Freight.	Passenger.	Other.	Maintenance of way and structures.	Traffic.	Trans- portation.			
Illinois Central	4,766	\$5,398,143	\$6,270,958	\$14,439,985	\$4,004,560	\$6,038,272	\$550,981	\$11,200,381	\$228,960	\$2,174,890
International & Great Northern	1,159	3,327,063	1,001,210	4,667,327	1,235,351	1,866,885	225,351	1,088,010	14,761	189,639
Kanawha & Michigan	1,177	1,104,591	148,942	1,302,512	338,598	732,890	118,884	1,840,729	26,904	41,466
Kansas City, Mexico & Orient of Texas	466	4,424,589	78,660	4,506,160	103,120	387,933	13,940	936,287	122	289,859
Kansas City Southern	755	3,871,249	615,972	4,487,221	127,580	1,254,491	183,971	1,818,971	4,102	20,447
Lake Erie & Western	900	2,873,696	261,910	3,292,661	441,489	544,630	65,357	1,308,750	167,003	165,912
Lake Erie & Hudson River	296	1,319,937	7,048	1,384,588	176,943	224,357	17,885	355,331	1,432	39,956
Lehigh Valley	1,432	16,943,317	1,695,192	20,222,732	2,811,930	4,327,076	485,239	1,418,239	318,537	820,713
Long Island	1,154	3,677,612	1,092,644	5,062,537	552,873	758,355	148,799	1,487,939	98,984	71,096
Los Angeles & Salt Lake	302	4,527,544	87,350	5,613,633	109,854	1,011,072	19,114	1,849,733	118,526	1,928,625
Louisiana & Arkansas	302	4,527,544	87,350	5,613,633	109,854	1,011,072	19,114	1,849,733	118,526	1,928,625
Louisiana & River Navigation Co.	342	719,023	127,905	907,531	137,723	118,338	32,262	346,338	35,937	237,614
Louisiana Western	208	943,999	355,467	1,302,691	137,723	1,164,122	60,935	938,672	15,440	50,170
Louisville & Nashville	500	6,624,461	710,616	7,335,077	1,119,709	2,466,523	273,702	3,850,697	60,745	160,845
Maine Central	1,216	3,886,819	1,278,119	5,607,331	635,874	812,439	54,585	2,599,049	13,186	103,905
Maine Central & St. Louis	1,862	3,817,103	4,463,443	20,594,917	3,148,061	331,186	939,692	3,175,500	317,530	1,327,591
Michigan Central	385	805,757	224,331	1,075,766	227,142	159,325	24,965	350,697	41,403	49,435
Midland Valley	1,647	9,211,975	693,196	4,203,420	600,485	462,467	90,145	1,809,739	81,642	244,166
Minneapolis & St. Louis	4,228	9,211,975	693,196	4,203,420	600,485	462,467	90,145	1,809,739	81,642	244,166
Min., St. Paul & St. Marie	365	379,926	157,015	1,237,974	135,611	1,937,884	244,146	1,809,739	81,642	244,166
Missouri & North Arkansas	365	379,926	157,015	1,237,974	135,611	1,937,884	244,146	1,809,739	81,642	244,166
Missouri, Kansas & Texas System	3,865	11,310,648	3,635,665	16,173,231	3,131,397	3,198,598	330,494	6,102,864	109,291	1,185,637
Missouri, Oklahoma & Gulf	132	1,122,909	104,783	1,227,692	126,910	1,126,782	28,916	595,956	1,114	16,550
Missouri Pacific	3,822	10,775,466	1,987,395	13,900,182	2,149,915	2,223,109	343,852	5,424,194	39,067	1,010,260
Mohile & Ohio	1,160	4,526,261	1,237,974	5,507,766	595,507	1,237,258	189,281	1,839,996	12,818	90,364
Monongahela	108	786,753	55,407	860,092	142,566	69,078	4,613	240,729	448	61,092
Monongahela Connecting	6	1,875,896	563,729	2,439,625	470,961	1,968,664	60,465	2,774,984	11,685	52,573
Monongahela & St. Louis	1,237	4,190,354	1,239,487	5,975,410	600,602	1,323,419	283,302	2,774,984	64,022	128,575
Nashville, Chattanooga & St. Louis	165	874,340	279,176	1,879,049	174,083	333,721	54,714	593,741	29,106	484,809
New Orleans & North Eastern	285	486,141	131,145	659,266	70,817	1,444,365	22,499	1,018	33,809	50,502
New Orleans Great Northern	285	486,141	131,145	659,266	70,817	1,444,365	22,499	1,018	33,809	50,502
New York Central & Westchester	6,083	57,544,380	20,752,726	90,917,979	9,212,733	17,088,216	1,249,420	38,018,835	1,355,753	1,579,019
New York, Chicago & St. Louis	571	5,968,598	455,680	6,700,826	543,412	1,001,381	223,843	3,456,127	23,350	58,001
New York, New Haven & Hartford	1,992	16,580,065	12,653,524	31,116,424	4,519,385	24,071,851	2,011,369	69,126,326	2,794,253	4,676,834
New York, Ontario & Western	568	2,328,866	413,099	3,004,919	442,205	606,488	43,482	1,478,072	96,949	17,205
New York, Susquehanna & Western	131	1,028,066	240,907	1,419,071	112,478	163,799	2,954	381,943	28,135	36,435
Norfolk & Western	2,085	2,198,907	2,286,489	25,088,590	2,398,184	4,742,800	317,690	7,592,208	51,190	134,509
Norfolk Southern	908	1,629,088	436,403	2,187,428	263,007	339,076	43,787	736,151	41,497	8,622,507
Norfolk Southern	908	1,629,088	436,403	2,187,428	263,007	339,076	43,787	736,151	41,497	8,622,507
Northwestern Pacific	6,514	25,588,798	5,417,696	33,776,757	4,358,646	3,788,538	513,449	9,946,798	498,240	31,281
Northwestern Pacific	6,514	25,588,798	5,417,696	33,776,757	4,358,646	3,788,538	513,449	9,946,798	498,240	31,281
Oregon Short Line	2,307	8,830,940	2,025,983	11,270,033	1,280,491	1,441,327	184,066	3,184,440	193,688	545,060
Oregon-Washington R. & Nav. Co.	2,052	5,789,470	1,834,670	8,324,587	1,225,874	897,308	229,511	2,713,141	113,311	1,138,132
Panhandle & Santa Fe	670	2,153,639	423,706	2,667,834	357,352	474,723	23,695	738,196	.....	89,536
Pennsylvania Company	1,755	20,625,061	5,000,101	28,775,834	3,885,176	5,782,121	432,684	13,938,538	226,670	1,179,794
Pennsylvania Railroad	4,716	71,229,766	19,037,317	100,467,978	12,642,732	20,722,767	1,080,912	40,126,335	1,596,404	5,130,784
Pere Marquette	2,250	3,168,426	640,658	4,222,296	485,626	434,337	80,776	1,603,074	1,665	43,580
Philadelphia & Reading	1,127	2,700,895	2,904,079	26,432,853	1,516,676	239,081	67,863	1,511,124	90,738	2,458,575
Philadelphia, Baltimore & Washington	718	5,748,974	4,872,777	11,798,887	1,608,224	2,359,492	146,730	5,111,016	959	41,514
Pittsburgh & Lake Erie	225	7,364,964	836,455	9,546,339	1,188,440	1,978,518	78,352	3,187,745	28,104	2,175,089
Pittsburgh, Cincinnati & Western	2,307	8,830,940	2,025,983	11,270,033	1,280,491	1,441,327	184,066	3,184,440	193,688	545,060
Pittsburgh, Cincinnati & Western	2,307	8,830,940	2,025,983	11,270,033	1,280,491	1,441,327	184,066	3,184,440	193,688	545,060
Pittsburgh, Shawmut & Northern	205	489,816	27,237	595,207	71,992	254,327	6,109	241,348	349,387	84,403
Port Reading	21	667,682	757,926	37,596	49,418	1,453,912	.....	3,604	544,500	16,336
Richmond, Fredericksburg & Potomac	88	991,574	1,943,724	162,443	196,345	2,962,555	19,964	655,585	22,962	1,001,362
St. Joseph & Grand Island	258	823,411	120,325	997,956	311,771	1,060,616	19,431	343,327	5,360	146,681
St. Louis, Brownsville & Mexico	548	958,999	613,414	1,688,922	247,131	197,914	50,581	498,815	60,013	425,934
St. Louis, Iron Mountain & Southern	3,539	12,711,575	3,262,083	25,152,857	2,781,588	388,132	50,974	11,072,927	335,035	2,700,677
St. Louis, Merchants' Bridge Terminal	9	1,236,815	2,894	1,239,815	145,355	68,208	4,444	901,780	37,722	36,489
St. Louis—San Francisco	4,752	15,069,333	5,337,244	21,997,617	2,690,648	3,978,305	330,072	14,875,640	7,115,578	986,984

* Figures shown are for two months ended May 31.

REVENUES AND EXPENSES OF RAILWAYS

FIVE MONTHS OF CALENDAR YEAR, 1917—CONTINUED

Name of road.	Average mileage operated per period.	Operating revenues—				Operating expenses—				Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
		Freight.	Passenger.	Total.	(Inc. misc.)	Maintenance of way and structures.	W. and structures.	Traffic.	Trans- portation.				
St. Louis, San Francisco & Texas.....	244	3,176,573	\$126,505	\$482,891	\$72,544	\$89,784	\$10,897	\$187,264	\$33,118	244,608	187,550	\$28,228	\$38,003
St. Louis Southwestern.....	943	3,705,838	667,010	4,372,848	384,919	765,618	160,043	1,025,762	335,932	1,361,694	187,550	\$28,228	\$38,003
St. Louis Southwestern of Texas.....	811	1,496,248	397,255	2,051,755	346,278	540,740	71,272	908,286	\$11,849	920,135	79,240	\$11,849	\$13,333
Seaboard & Atlantic Coast.....	346	870,256	225,554	1,095,810	161,763	376,303	33,149	765,033	5,665	770,698	91,062	\$11,849	\$13,333
Seaboard & Atlantic Coast of Texas.....	346	870,256	225,554	1,095,810	161,763	376,303	33,149	765,033	5,665	770,698	91,062	\$11,849	\$13,333
Southern in Mississippi.....	693	2,387,636	716,018	3,103,654	347,029	860,181	143,512	1,003,693	347,323	1,351,016	542,480	\$11,849	\$13,333
Southern Pacific.....	7,074	36,984,992	12,615,083	49,600,075	7,619,184	891,340	19,616,419	850,809	1,376,572	35,966,597	27,454,313	\$11,849	\$13,333
Spokane, Portland & Seattle.....	555	1,736,124	560,614	2,296,738	284,782	37,326	553,824	21,920	38,713	1,885,292	89,790	\$11,849	\$13,333
Terminal R. Co. Ass'n. of St. Louis.....	27	368,583	149,210	517,793	113,423	110,413	24,876	264,921	.....	347,323	24,000	\$11,849	\$13,333
Texas & New Orleans.....	468	1,728,835	544,707	2,273,542	246,056	397,472	46,298	483,824	38,743	522,570	161,883	\$11,849	\$13,333
Texas & Pacific.....	1,947	5,912,261	2,245,962	8,158,223	1,014,859	1,109,610	20,329	3,271,143	62,344	8,220,363	161,883	\$11,849	\$13,333
Toledo & Ohio Central.....	436	2,397,760	236,887	2,634,647	393,415	554,419	36,154	1,201,174	8,666	2,643,338	124,961	\$11,849	\$13,333
Toledo, St. Louis & Western.....	436	2,397,760	236,887	2,634,647	393,415	554,419	36,154	1,201,174	8,666	2,643,338	124,961	\$11,849	\$13,333
Trinity & Brazos Valley.....	369	1,065,588	146,728	1,212,316	183,933	129,508	12,117	200,628	.....	1,081,808	37,500	\$11,849	\$13,333
Union Pacific.....	3,622	20,066,607	4,521,733	27,328,037	4,521,733	3,703,084	3,780,205	583,429	8,440,165	54,025	17,010	\$11,849	\$13,333
Union R. of Baltimore.....	8	682,291	159,971	842,262	45,090	208,456	707,357	34,591	1,161,581	17,010	21,008	\$11,849	\$13,333
Vicksburg, Shreveport & Pacific.....	171	1,513,357	205,576	1,718,933	245,551	280,838	23,455	381,291	8,538	1,700,398	18,535	\$11,849	\$13,333
Virginian.....	519	3,744,047	185,492	3,929,539	61,245	1,315,936	61,245	2,613,603	80,260	3,709,363	18,535	\$11,849	\$13,333
Wabash.....	2,519	11,797,629	2,746,807	15,544,436	1,495,324	2,113,442	473,310	6,674,941	90,629	15,151,531	50,615	\$11,849	\$13,333
Washington Southern.....	36	331,088	424,737	755,825	68,514	104,412	7,831	230,542	10,076	725,813	62,421	\$11,849	\$13,333
Western Maryland.....	725	1,476,909	257,894	1,734,803	591,857	574,878	54,737	1,184,612	18,744	1,203,356	151,016	\$11,849	\$13,333
Western Railway of Alabama.....	133	346,331	210,511	556,842	77,122	129,202	109,219	1,924,888	58,027	1,416,861	29,799	\$11,849	\$13,333
Western Pacific.....	938	2,866,701	503,599	3,370,300	534,444	550,600	100,786	1,073,576	59,403	3,310,724	182,500	\$11,849	\$13,333
Wheeling & Lake Erie.....	512	3,046,540	288,481	3,335,021	463,524	579,540	41,263	1,362,988	8,444	3,296,533	30,491	\$11,849	\$13,333
Yazoo & Mississippi Valley.....	1,382	5,093,503	1,355,840	6,449,343	1,169,140	1,120,912	107,004	2,620,680	17,754	6,272,662	522,849	\$11,849	\$13,333

Traffic News

The Railway Commissioners of Canada have granted the request of the railways for an increase on both through and local grain rates from Fort William eastward, and also have made an advance in lake and rail rates.

The International railroad bridge at Brownsville, Tex., is soon to be re-opened for through passenger and freight traffic. As at other frontier points, the freight cars and passenger coaches of the United States railroads will be permitted to go only across the river (to Matamoros), and will not be allowed to proceed further into Mexico.

Attorney General B. F. Looney, of the state of Texas, has filed in the District Court, at Aune, suits against 66 railroads to restrain them from charging differential freight rates on goods moving for distances less than 351 miles between points within Texas. The hearing of the case has been set for July 30. It is alleged by the attorney general that the railroads have not properly construed the order of the Interstate Commerce Commission in the Shreveport case, with respect to differential rates, and that the carriers have been charging rates that are not authorized in that order.

The Montana Railroad and Public Service Commission and the Corporation Commission of Oklahoma issued orders on July 5 and 10, respectively, providing for demurrage rates applicable to intrastate traffic identical with the rates now in force covering interstate traffic. The Oklahoma commission also reduced from 72 hours to 48 hours the free time allowed on cotton at interior presses for compression in transit, carload freight consigned to consignees located more than five miles from a railroad station and carload shipments weighing in excess of 66,000 lb. The Corporation Commission of Oklahoma is the first western commission to shorten the free time on these kinds of traffic.

The express companies doing business in Chicago will on July 31 discontinue the vehicle pick-up of business after 5 p. m. Among the reasons assigned for this action are the great volume of business, which comes to the express companies at and near the close of the day, thereby precluding the possibility of efficient handling; the unusually heavy volume of traffic which has been moving through express channels during the past year, and the program inaugurated by the railroads, under the direction of the Railroads' War Board, contemplating substantial curtailments of passenger train service. This plan is already in successful operation in several important cities, including New York. In order that an avenue may be afforded for expediting emergency shipments which may not be ready for forwarding at 5 p. m., all local offices of the company in Chicago will be open for the receipt of matter up to 6 p. m., and arrangements have been made for the prompt handling of goods brought in after 5 o'clock. In addition, those offices now receiving express matter at all hours of the day and night will be continued. The companies which have joined in adopting the new rule are the Adams, the American, the Great Northern, the National, the Northern, the Wells-Fargo, and the Western.

A. C. L. Food Preparedness Campaign

In response to the request of the Department of Agriculture the Atlantic Coast Line has posted at its stations a poster entitled "Plant Corn." The poster calls attention to the estimated inadequate production of wheat this year, and says: "Plant corn on all suitable land not used for other food or feed crops. If early planting has failed, replant wherever there is a chance for a crop."

The Atlantic Coast Line has also sent circulars to all cottonseed oil mills in Virginia, North Carolina and South Carolina, urging them to grind peanuts and soy beans in addition to cottonseed. This letter points to the success of Texas cottonseed oil mills, which have produced oil from peanuts and soy beans, and calls attention to the fact that it is necessary in many sections of the South to encourage the planting of those crops as

a preliminary step towards defeating the ravages of the boll weevil.

In a recent letter to chambers of commerce in Virginia, North and South Carolina, the Atlantic Coast Line urges bankers and business men to make arrangements to grant farmers advances on their crops. There is some fear on the part of the farmers that if they greatly increase their acreage of food crops the speculator will take advantage of the fact that they have to sell in the fall.

Further Train Service Reductions in the Middle West

The Cincinnati, Hamilton & Dayton recently discontinued two trains between Cincinnati, Ohio, and Dayton; two between Cincinnati and Glendale; two between Cincinnati and Hamilton, and two between Dayton and Lima, aggregating 8,885 train-miles per month. The Pere Marquette on July 17, discontinued ten trains on the Chicago division and four on the Elk Rapids (Mich.) branch, and substituted every-other-day instead of daily, except Sunday, service on two other branch lines. On the Toledo division it eliminated eight trains and inaugurated every-other-day service on two branches instead of six days a week. On the Detroit division it abandoned two daily trains and discontinued Sunday service for two other trains. On the Port Huron-Grand Rapids division four trains were discontinued on July 17, four other trains having been eliminated on May 1. Every-other-day week-day service was substituted for six days a week on two branch lines of this division, effective May 1.

Coal Movement to New England

The New York, New Haven & Hartford reports a large increase in the movement of coal from the mines to points on its lines by rail all the way; this as a result of the high rates by water from New York and other coal shipping ports. The receipts at the New Haven road's stations for the month of May and June (number of carloads) are as below:

	1917		1916	
	All Rail	Total	All Rail	Total
May	17,168	21,850	.....	15,546
June	15,974	20,707	.....	17,466
Average per month for 6 months	13,213	.....	12,377	.....

There is still a considerable movement of coal to New England ports by water. The falling off in this movement has been more than made up by the increase in all-rail shipments.

State Commission Urges Full Car Loading

The Public Service Commission of Washington has issued an open letter, addressed to shippers and railroads in that state, citing the appeal of the Railroads' War Board for the fullest use of all railroad equipment, and explaining the duty of state commissions and intrastate shippers to acquiesce in the plans of the national government, and says:

"Therefore, we insist and direct that all railroad equipment be loaded to its fullest carrying capacity, regardless of minimum, save in such cases as the commodity shipped would be damaged thereby; and we invite the railroads to rearrange their minimums in this state, the same to be in effect during the period of the present war, unless sooner revoked by order of this commission."

Long Island Holiday Traffic

General Manager J. A. McCrea, of the Long Island, reports the average delay to passenger trains on that road for the Fourth-of-July holiday period (five days) as 2 minutes 36 seconds; and the average delay to each train that was late was 7 minutes 7 seconds. Total number of trains, 3,965; number on time, 2,041. The statement gives the following data for the holiday period in this and preceding years:

	1910	1915	1916	1917
Passenger train movements	4,253	5,015	5,361	4,897
Passenger car movements	18,502	29,733	27,321	24,094
Baggage car movements	1,103	1,369	1,508	1,382
Freight and work train movements	430	374	411	356
Freight car movements	9,867	7,939	8,986	8,124
Passengers carried on trains	686,727	917,917	1,029,721	1,023,365
Carloads of express and baggage moved	421	780	1,077	977

The average delay to passenger trains for nine years has been: 1909, 2 min. 22 sec.; 1910, 2 min. 35 sec.; 1911, 3 min. 5 sec.; 1912,

1 min. 44 sec.; 1913, 3 min. 52 sec.; 1914, 3 min. 3 sec.; 1915, 2 min. 45 sec.; 1916, 4 min. 33 sec.; 1917, 2 min. 36 sec.

There were no personal injuries or train accidents.

Excellent Record in Car Conservation

During the month of June the R. T. Crane Company, Chicago, handled 410 cars on the Chicago River & Indiana tracks at Corwith yards, Chicago, with an average detention of only 1.46 days. Out of the 410 cars, 311 were released within the first 24 hours, 44 within the first 48 hours, 33 within 72 hours, 13 within 96 hours, 7 within 120 hours and 2 within 144 hours.

Getting the Passenger's Point of View

Charles S. Fee, passenger traffic manager of the Southern Pacific, is distributing to passengers as they come on the Southern Pacific lines at Ogden, Utah; Portland, Ore., and El Paso, Tex., post cards upon which they are invited to write comments and suggestions relative to the service. The card explains the company's purpose to maintain uniformly high standards, and says: "We are anxious to know how you enjoyed your trip—what scenic points appealed most to you—what feature of Southern Pacific service impressed you—how our trains and service compare with those of other roads. . . . We shall be glad to plan itineraries for you. If you have friends who would like travel information, give us their names. . . . After writing your comments please hand this card to the conductor before leaving train, or mail it from your destination."

Shippers Urged to Reduce Switching Requirements

The National Automobile Chamber of Commerce, New York City, has issued a circular to members of the chamber, offering suggestions looking to conservation of transportation resources in every possible way. At three large plants during the past month the loading of automobiles into cars has been managed so as to test the possibility of reducing the number of switching "cuts" required to place in trains the outbound loads; and it is found that a very considerable amount of time and engine power can be saved. The circular gives the following example of indiscriminate loading:

Car Number	Destination	Direction for train movement
CMPS 207385	Lewiston, Idaho	West
MC 90372	Hartford, Conn.	East
MC 88845	Kansas City, Mo.	West
MC 92458	Boston, Mass.	East
NYC 236434	Chattanooga, Tenn.	South
NYC 251558	Philadelphia, Pa.	East
CR&P 60613	El Paso, Texas	West
MC 95504	Cincinnati, Ohio	South
MC 87584	New York	East
Sou 160208	Atlanta, Ga.	South

The same cars and the same shipments could be loaded as follows:

Car Number	Destination	Direction for train movement
CMPS 207385	Lewiston, Idaho	West
MC 90372	Kansas City, Mo.	West
MC 88845	New York	East
MC 92458	Hartford, Conn.	East
NYC 236434	Boston, Mass.	East
NYC 251558	Philadelphia, Pa.	East
CR&P 60613	El Paso, Texas	West
MC 95504	Cincinnati, Ohio	South
MC 87584	Chattanooga, Tenn.	South
Sou 160208	Atlanta, Ga.	South

The circular, signed by J. S. Marvin, manager of the traffic department, asks all members to adopt the plan of getting from the loading dock a list of car numbers and initials in the order in which the railroad places the cars. By comparing this with the loads to go forward it will be found that loads for the West, East and South can be grouped together to a considerable extent, as shown in the above example. Cars can thus often be classified for road movement by two or three shifts, where, under ordinary practice, they would have to go to classification yards for sorting.

"The automobile industry has done much to relieve the carriers during the prevailing crisis, as compared with the normal manner of shipping automobiles. This is what we and all other shippers should do. The suggestion herein goes a step further, and we trust it will be put into effect at once. You can frequently go further and keep all east-bound shipments out of a string of cars like this, assigning westbound loads to all cars standing between western owned cars."

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The Fifteen Per Cent Case

In allowing the southern and western roads an advance of 15 cents a ton in their rates on coal and coke in connection with the 15 per cent case, the Interstate Commerce Commission said that if some of the rates authorized to be increased were held by unexpired orders of the commission, the carriers might apply for modification of such orders. On July 23 the commission entered an order in 41 coal rate cases, on application of the roads, modifying the previous orders to permit an advance of not more than 15 cents a ton above the rates prescribed, effective on August 4, with the condition that if the relationships prescribed are thereby disturbed, the carriers shall restore the prescribed relationship within 90 days. The advanced class rates in Official Classification territory, allowed by the commission in its discussion in the 15 per cent case, went into effect on July 16, and later dates on five days' notice.

STATE COMMISSIONS

The Railroad Commission of Louisiana, in an order dated July 19, has denied the application of the railroads in that state for authority to make a general advance of 15 per cent in freight rates, holding that the proposition has not been justified. The report of the commission begins with the declaration that the railroads have called upon the commission to "issue them an insurance policy at the rate of 15 per cent above all of their existing freight rates, to secure them against contemplated diminutions in their revenue, during an indefinite period, in order that they may meet what they have termed an emergency." The testimony presented by the railroads as to the emergency is held by the commission to be not at all clear. Gross receipts have improved, and the commission believes that unsatisfactory net earnings on some of the smaller roads have been due to inability to get cars. It is not believed that the 15 per cent advance in freight rates will in any way affect the ability of the railroads to serve the government properly. Conditions are declared to be very prosperous over the entire state. The Interstate Commerce Commission has refused to allow the advance in interstate rates, and as the application for an increase in Louisiana was based largely on the expectation of authority to increase interstate rates, it is decided to allow no advance.

PERSONNEL OF COMMISSIONS

Henry W. Hodge, appointed a bridge engineer to go with the army to France, has resigned his place as member of the New York State Public Service Commission for the First district.

COURT NEWS

Storage Charges on Goods Delivered to Steamship

The Massachusetts Supreme Judicial Court holds that where a railroad has transported to the seaboard goods to be delivered by it to a steamship to be carried to a foreign port, and those goods, as against the shipper, are subject to storage charges for which the railroad has a lien, an implied contract arises whereby the steamship company assumes responsibility for the charges on the goods received by it.

Goods so transported were subject to storage charges, for which the railroad had a lien, and which it was bound to collect. The railroad wrote the steamship company that it was obliged to collect the charges in accordance with the tariff, and if the goods were taken forward by the steamship company the railroad would hold it responsible for the payment of such charges. The steamship company replied requesting a copy of the tariff. This was sent, and thereafter the steamer accepted certain of the goods. It was held that, as a matter of law, an implied contract was made by the steamship company to assume responsi-

bility for the charges on the goods so taken.—*Boston & Maine v. Oceanic Steam Nav. Co. (Mass.)*, 116 N. E., 260. Decided May 23, 1917.

Rate Discrimination

The Massachusetts Supreme Judicial Court holds that the Public Service Commission cannot, under section 24 of the Public Utilities Act, authorizing it, upon finding a carrier's rates to be unduly discriminatory, to determine reasonable rates, require a railroad to eliminate an alleged discrimination by absorbing switching rates, where there is no finding that the resulting rate would be reasonable, and an injunction prevents discontinuance of the alleged preferential switching absorption rate.—*National Dock & S. W. Co. v. Boston & Maine (Mass.)*, 116 S. E., 544. Decided May 29, 1917.

Demurrage or Storage Charges

The Kilby Car & Foundry Company shipped to its own order its cars over the L. & N. and a connecting road. The cars were not sold as anticipated, and were left on the tracks of the connecting carrier for some time, when they were ordered returned. On return the L. & N. paid the connecting carrier demurrage or storage charges, which it afterwards sought to recover from the car company. The connecting carrier's tariff of storage charges filed with the Interstate Commerce Commission provided that freight, except company material, received for delivery or held for forwarding directions, stored in or on railroad premises, is subject to storage regulations as follows: (a) For unloaded freight not removed within 48 hours; (b) carload freight placed on delivery tracks and subsequently unloaded is subject to demurrage rules while in cars, and to storage rules after unloading; (c) for unloaded freight upon which free time allowed has expired while in cars; (d) for freight received if held more than 48 hours after receipt. The Alabama Supreme Court holds that the demurrage or storage charges advanced by the L. & N. to the connecting carrier could not be recovered from the shipper, as the schedule filed was not applicable to demurrage or storage charges on cars standing on their own wheels on side tracks.—*L. & N. v. Kilby C. & F. Co. (Ala.)*, 75 So., 394. Decided April 26, 1917.

Cannot Suspend Rates Below Commission Maximum

The Illinois Railroad and Warehouse Commission was by statute authorized to fix reasonable maximum rates and charges for the transportation of persons or property by rail; to investigate and ascertain whether the provisions of the act were violated and cause suits to be commenced and prosecuted against any railroad companies which might violate the provisions of the act. The act declared that the commissioners should make for each common carrier doing business in the state a schedule of reasonable maximum rates for the intrastate transportation of property which should be deemed prima facie reasonable. In 1913 the railroads filed with both the Interstate Commerce Commission and the Railroad and Warehouse Commission grain tariffs advancing rates above those previously charged an average of about one cent per 100 lb. The rates were suspended by the state commission; and its successor, the Public Utilities Commission, after hearings, disapproved the advances. The Interstate Commerce Commission approved the same advances, as applied to interstate commerce, and these went into effect on January 8, 1914. The state commission in 1906 established maximum reasonable rates governing the transportation of grain, which were higher than those now filed by the carriers. The Illinois Supreme Court holds that, as the powers of the commission were strictly circumscribed by the statute, it had no power on protests of shippers to suspend tariffs filed by the railroads which were less than the maximum rates fixed by the commission. Nor could the Public Utilities Commission, on coming into being, suspend such rates until a determination was made of their property. The petition of the protestants was treated as a protest against the rates filed, and no change would be made in those now charged until the final order of the commission is made. The district court was directed to set aside the order of the commission, and to direct the commission to further proceed with the case in accordance with these views.—*State Public Utilities Commission v. A. T. & S. F. (Ill.)*, 115 N. E., 904. Decided April 10, 1917.

Federal Employers' Liability Act

The Alabama Supreme Court holds that a car repairer injured while working on a car used the previous week in interstate commerce, but which had "drifted" for a week and was not again used, except in intrastate commerce, for several weeks after the injury, could not recover of the railroad under the act.—*Loveless v. L. & N. (Ala.)*, 75 So., 7.

The Circuit Court of Appeals, Fourth Circuit, holds that a trackman, engaged in assisting a surveyor in a survey made to improve the curve in a track used in interstate commerce, is within the act.—*Southern v. McGuin*, 240 Fed., 649.

The Alabama Supreme Court holds that a railroad employee engaged in clearing out ditches along the railroad's main line, which was used for interstate commerce, was engaged in interstate commerce.—*Louisville & Nashville v. Blankenship (Ala.)*, 74 So., 960.

The Kentucky Court of Appeals holds that a railroad employee injured while painting a bridge used for interstate commerce was within the act.—*L. & N. v. Netherton (Ky.)*, 192 S. W., 1035.

A railroad lying wholly within a state, forming a link between interstate carriers, transported both interstate and intrastate freight and passengers, commingled, and the several engines of the road were indiscriminately used in both kinds of service. The Circuit Court of Appeals, Sixth Circuit, holds that an engine devoted to such purposes was an instrumentality of interstate commerce, and one injured in repairing it might sue under the act.—*Chicago, Kalamazoo & Saginaw*, 234 Fed., 1.

Where a brakeman, who was a member of a train crew engaged indiscriminately in handling interstate and intrastate freight, was injured while going from his caboose, which was awaiting assignment to the yard office for supplies for the caboose, the Montana Supreme Court holds that he was not then employed in interstate commerce. It was immaterial that the work had to do with interstate commerce to a greater extent than purely intrastate shipments.—*McBain v. Northern Pacific (Mont.)*, 160 Pac., 654.

The Supreme Court of the State of Washington holds that an employee, injured while building a scaffold to be used by him in painting a freight shed, which is used by a railroad as an instrumentality in interstate commerce, is not engaged in an act so directly and immediately connected with interstate commerce as substantially to form a part or necessary incident thereto, and his injury is therefore not compensatable under the Federal statute.—*Killes v. Great Northern (Wash.)*, 161 Pac., 69.

The California Supreme Court holds that a gateman, in the employ of a railroad using its tracks indiscriminately for both interstate and intrastate commerce, killed by an intrastate train when he started to cross the track to back away a horse and wagon which had come within the range of one of the gates so that he could not lower it, was "engaged in interstate commerce," so that the State Industrial Accident Commission was without jurisdiction to make any award.—*Southern Pacific v. Industrial Accident Commission (Cal.)*, 161 Pac., 1,139.

The Wisconsin Supreme Court holds that a janitor in an interstate railroad's general office in a town, who was struck in the eye with a small splinter flying off when he was breaking up coal for the furnace with an ax, was not engaged in interstate commerce when injured.—*Great Northern v. King (Wis.)*, 161 N. W., 371.

The Circuit Court of Appeals, Second Circuit, holds that a car repairer, employed by an interstate carrier, who was injured while working on a car belonging to another interstate carrier, and which must be returned in interstate commerce, was not engaged in interstate commerce within the act, the car not being then so engaged.—*Central of New Jersey v. Paslick*, 239 Fed., 713.

The Circuit Court of Appeals, Second Circuit, holds that an employee of a carrier, practically all of whose business was interstate commerce, was not engaged in interstate commerce while placing rails in a pit.—*Hudson & Manhattan v. Ioris*, 239 Fed., 855.

The Colorado Supreme Court holds that an employee wrecker or car repairer of a railroad engaged in both intra- and interstate commerce, who was killed while clearing a wreck, was engaged in interstate commerce.—*Denver & R. G. v. Wilson (Colo.)*, 163 Pac., 857.

Equipment and Supplies

LOCOMOTIVES

THE CHICAGO & ALTON is reported in the market for 5 additional Mikado locomotives.

UNITED STATES GOVERNMENT.—As the *Railway Age Gazette* was the first to report last week, the United States Government has ordered 150 80-ton Consolidation locomotives from the American Locomotive Company, and 150 from the Baldwin Locomotive Works. These engines are for the service of the American forces in France, and will be given, it is understood, priority over all other business. The locomotives are of standard gauge. The 150 to be built by the Baldwin Locomotive Works will be similar to the British Government Consolidation locomotives now on order or recently built by that company. An illustration of one of these locomotives appeared in the Patriotic War Number of the *Railway Age Gazette*, June 22, page 1465. The 150 locomotives to be built by the American Locomotive Company will be built to the same designs as the locomotives now on order for the French State Railways.

FREIGHT CARS

THE ALABAMA & VICKSBURG is inquiring for 30 to 40 30-ton steel center sill stock cars.

THE SEMET-SOLVAY COMPANY, Syracuse, N. Y., is in the market for 100 hopper cars.

THE ATCHISON, TOPEKA & SANTA FE has ordered 100 ore cars from the Pullman Company.

THE REPUBLIC IRON & STEEL COMPANY is reported in the market for 50 coke and 50 gondola cars.

THE NEW YORK, NEW HAVEN & HARTFORD is inquiring for 50 refrigerator cars, 25 for freight and 25 for passenger train service.

THE HUDSON BAY COMPANY has given an order to American car builders for 1,200 steel gondola cars, to be shipped to the Dutch East Indies.

PASSENGER CARS

THE LONG ISLAND is asking prices on 25 passenger and baggage cars and 40 coaches.

BRITISH LOCOMOTIVES IN WAR GARB.—The latest locomotives built at Crewe, England, are finished in the "all-black" style adopted as a war time finish in which considerable economy is effected by dispensing with lining out and other decorative work. The engines present a striking appearance in this garb.

LOAN TO BOLIVIA FOR RAILROAD CONSTRUCTION.—Proceeds of the \$2,400,000 issue of 6 per cent bonds purchased by a group of banking houses, consisting of the Equitable Trust Company, Chandler & Co., Inc., and Counselman & Co., of Chicago, are to be used in the construction of a railroad from La Paz, the principal city of Bolivia, into the Yungas Valley. The orders for the materials necessary for the building of the railroad are to be placed in this country. Bolivia entered this market for funds as early as last March. Negotiations for a loan were completed soon after, but a public offering of the issue was delayed until the Liberty Loan had been sold. The Department of State has expressed its satisfaction over the fact that the South American republic was successful in negotiating a loan in the United States, Secretary of State Lansing having written a letter to this effect on May 11, 1917, to the Hon. Ignacio Calderon, the Bolivian minister here. The negotiations on behalf of Bolivia were conducted by the Hon. Adolfo Ballivian, consul general in the United States. Chandler & Co. are the fiscal agents for Bolivia in this country.

Supply Trade News

A. D. Bruce, in charge of purchases and supplies for the Vapor Car Heating Company, Inc., Chicago, has been elected secretary and controller, succeeding Arthur P. Harper, resigned.

H. G. Doran & Co., Peoples Gas building, Chicago, have been appointed selling agents for the Schaefer Equipment Company, Pittsburgh, Pa., manufacturers of the Schaefer truck lever connections.

W. J. Gillingham, who has been identified with the Hall Switch & Signal Company since 1900, successively as general agent, resident manager, and general sales manager, has been elected vice-president of that company, with headquarters in New York.

Roland C. Fraser, vice-president of the Buffalo Brake Beam Company, whose death at Suffern, N. Y., on June 17 was noted in these columns last week, was born at Boston, Mass., April 11,

1865. Mr. Fraser was widely known in the supply trade. He began his business career in the railway supply field by joining the business staff of the *Railroad Gazette* in 1890. After several years' service in that position he was employed, successively, by the Monarch Brake Beam Company, of Detroit; the U. S. Metal & Manufacturing Company, of New York, and the Buffalo Brake Beam Company, of New York. At the time of his death he was vice-president of the last named company and had been in its service for 14 years.



R. C. Fraser

At a meeting of the executive committee of the board of directors of the American Locomotive Company, held July 18, David Van Alstyne was appointed an assistant vice-president, in charge of manufacture, effective July 1, 1917. Mr. Van Alstyne has hitherto held the title of assistant to vice-president.

Aall & Co., of Tokyo, the Japanese agents for the American Steel Export Company, have added B. Orum Andresen to their engineering staff. Mr. Andresen, prior to leaving for Japan, spent several days acquainting himself with the organization and the facilities the American Steel Export Company has for export engineering and contracting.

The C. F. Massey Company, Chicago, placed additional factories in operation at Youngstown, Ohio, and at Los Angeles, Cal., on July 1, making 13 plants now in service. C. Hunsacker has been transferred to Youngstown and placed in charge of the plant at that place, while N. R. Brown, formerly with the Lehigh Portland Cement Company, has assumed charge of the plant at Los Angeles.

Among those in the service of the American Steel Export Company, New York, who have been called to the colors, is K. G. Martin, manager of the service and publicity departments. Mr. Martin was granted an honorable discharge from the 22nd Regiment, Corps of Engineers, N. G., N. Y., in order to be able to accept a commission as captain, Officers' Reserve Corps, Motor Transport Service.

The Walls Frogless Switch & Manufacturing Company, Kansas City, Mo., has leased a building at Twenty-third and Broadway, Kansas City, where it will manufacture the Walls Frogless switch. The device eliminates the old style point frogs and slip switches, and provides for a straight rail at all times. It is ex-

pected that the factory will be in operation by September 1. W. J. Stone Burner has been appointed general manager of the company, with headquarters at Kansas City, Mo., and C. E. Ennis has been appointed assistant secretary.

Seven Chicago railway supply companies recently made a gift of \$385 to the Thirteenth Engineers, United States army, the railway regiment recently quartered at Chicago, and formerly known as the Third Reserve Engineers. Of this amount, \$85 was used to cover the expenses of a band, which furnished music during a review of the regiment on July 12, and the remaining \$300 will be used to provide greater comforts for the men. The companies which contributed to the fund were the P & M Company, Robert W. Hunt & Co., the Railroad Supply Company; Fairbanks, Morse & Co.; the Rail Joint Company, the Galena-Signal Oil Company, and Pratt & Lambert.

The Automatic Straight Air Brake Company

The Automatic Straight Air Brake Company of New York during the next few weeks will send out invitations to many of the leading railroad officers of the country to witness the operation of the automatic straight air brake, on a 100-car test rack at New York, and shortly thereafter to attend the road service trials, which will be conducted by the Division of Safety of the Interstate Commerce Commission.

The company has leased a building in which it has installed a 100-car test rack, which includes the complete car equipment arranged with full length train line and all other piping, just as it would be applied on a 100-car train. The apparatus for each car includes a trainagraph with three recording pens indicating respectively the pressure of the brake cylinder, the auxiliary reservoir and the train line. An observer can thus see at a glance just what takes place on each car in the train.

During the fall of 1915 this brake was tested in road service on the Atchison, Topeka & Santa Fe, under the supervision of the Division of Safety of the Interstate Commerce Commission, and since that time the improvements suggested by the commission in its report to Congress in June, 1916, have been made in the equipment. The principal features of the brake are the use of wing valves, the movement of which is controlled by diaphragms under the action of differential pressures and the use of train pipe air for the service application of the brake, making possible the maintenance of a predetermined brake cylinder pressure indefinitely without the necessity of the release and reapplication of the brakes, and without the aid of retaining valves.

TRADE PUBLICATIONS

CRANES.—Catalogue No. 130, recently issued by the Whiting Foundry Equipment Company, Harvey, Ill., is an attractive and well illustrated book, 8½ in. by 11 in. in size, descriptive of the line of Whiting cranes. The catalogue gives illustrations and descriptions of a large number of cranes of different types, and shows views of typical installations. Many of the cranes given are for special use on railroads, as, for example, at ash pits, for transfer service, for handling freight and in locomotive shops.

ACORN DIES AND HOLDERS.—The Greenfield Tap & Die Corporation, Greenfield, Mass., has recently issued an illustrated booklet describing its Acorn dies and die holders. The Acorn die is adjusted radially by means of an internal cone adjusting cap which fits over the ends of the die lands. This makes possible accuracy of adjustment without interfering with the lead. The die is easily sharpened by grinding, and when once set up may be removed and replaced or reground without disturbing the position of the holder in the machine. The catalogue contains illustrations showing clearly the construction of the Acorn die, the releasing die holder and adapter for applying the Acorn die to machines or holders already in operation. The holders are hollow and there is no limit to the length of thread which they will cut. The booklet contains the usual catalogue information as to prices and specifications.

RAILWAYMEN IN THE BRITISH ARMY.—At the end of April, 1917, 4,359 employees of the London, Brighton & South Coast had gone on active service. Members of the company's pension fund who had gone numbered 2,028, and the company was paying their contributions during their absence.

Railway Construction

DANVILLE, KANKAKEE & CRESCENT TRACTION.—This company will soon begin the construction of a line from Danville, Ill., through Potomac, Ellis, Rankin, Cissna Park, Crescent City, Le Rable and Woodworth to Kankakee, a total distance of 81 miles. Right of way has been obtained on approximately 40 per cent of the proposed route, and surveys made on about half. There is no heavy grading, and only two curves in the entire mileage. A contract for the work has been let to the C. E. Coon Construction Company, Cleveland, Ohio. The road will operate passenger and freight service. E. E. Myer, Crescent City, Ill., is president, and W. K. Woodruff, Kankakee, is chief engineer.

DULUTH, MISSABE & NORTHERN.—This company has completed plans for the double-tracking of its line between Virginia, Minn., and Wolf, a distance of approximately 10 miles. In connection with this project the road will also build additional yard tracks. The total cost of improvements will be about \$150,000.

FREEPORT SULPHUR COMPANY.—This company is contemplating building a line from Freeport, Tex., to Rosenberg, by way of Brozorria and Columbia. The line will be approximately 60 miles long. It is as yet only partly located. W. A. Randle, Freeport, Tex., is chief engineer.

GRAND TRUNK.—Plans for two new stations have been completed by this company. Work is to be started at once on a modern station building at St. Catharines, Ont., and work has already been started on a new station at Berlin, N. H. The latter is to be a brick building with a granite base and tiled roof.

GREAT NORTHERN.—This company contemplates the construction of a bridge 1,600 ft. long over the Musselshell river at Weede, Mont., but does not expect to carry out the work in the immediate future.

GULF, COLORADO & SANTA FE.—This company will erect a freight house and office building at Temple, Tex. The building will be 32 ft. wide and 266 ft. long, with concrete foundations, brick walls and tile roof. The office portion will be two stories high, and the freight house one story high. Bids will be opened in about 30 or 45 days, and construction is expected to start within two months. The estimated cost is \$40,000.

KLAMATH FALLS MUNICIPAL RAILWAY.—This company, which will be the first unit of the Oregon, California & Eastern, is building a line from Klamath Falls, Ore., to Dairy, a distance of 20 miles. A contract has been let to the Robert E. Strahorn Construction Company, Spokane, Wash. The work involves about 250,000 cu. yd. of grading, of which approximately 75,000 cu. yd. is rock. The maximum gradient is 1.25 deg., and the maximum curvature 6 deg. R. E. Strahorn, Spokane, is president, and N. H. Bogue, Klamath Falls, is chief engineer.

MINERAL BELT.—This company is now building about five miles of new line between Sulphur Mine, Va., which is on the Chesapeake & Ohio and Valzinco Mine. The work includes one steel and concrete bridge of 350 ft. and about 100 ft. trestle approach on each side. G. P. Clay, Richmond, Va., is the contractor, and it is expected that the work will be finished before September this year. Berkely Williams, president, Richmond, Va.; Paul S. Morton is resident engineer.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—A contract has been awarded by this company to the Withee Construction Company for the building of a depot at Stevens Point, Wis. The building will be two stories high, of brick and reinforced concrete construction.

MISSOURI PACIFIC.—To provide for the traffic of the cantonment which is being established by the War Department at Fort Logan, H. Roots, near Little Rock, Ark., this company is building a spur 4.1 miles long, together with three sidings each 2,000 ft. long. There will also be a shelter, and the improvements altogether will cost \$100,000. Also the government is building,

within the camp grounds, about five miles of track. The Missouri Pacific is also laying additional side tracks at Jefferson Barracks, at a cost of about \$9,000.

MOLTZ LUMBER COMPANY'S ROAD.—Work is now under way building a line from Lake Toxaway, N. C., west to Sapphire, and track laying will be started about August 1. The work on three miles will be difficult, and on seven miles involves the handling of about 59,000 cu. yd. The maximum grade will be 4.5 per cent, and there will be one 36-deg. curve. The line is being built to carry lumber and forest products, and the work is being carried out with company's forces. Jerome Moltz, president, Asheville, N. C.; Robert S. Brown, engineer.

NORTHERN PACIFIC.—This company will construct a steel and concrete bridge over the Shields river near Livingston, Mont., to replace the old wooden bridge recently destroyed. The new structure will cost approximately \$200,000.

OSAGE COUNTY & SANTA FE.—This company has awarded a contract to Maney Brothers & Co., Oklahoma City, Okla., for grading, bridge work, track laying and surfacing, fencing and buildings, required for the construction of the line from Bowen to Fairfax.

PENNSYLVANIA-DETROIT.—A contract has been awarded by this company to the W. S. Newkall Company, Detroit, Mich., for 325,000 cu. yd. of grading, and 6,750 yd. of concrete masonry, for a classification yard at Detroit.

PENNSYLVANIA LINES WEST.—This company has awarded a contract to the Alliance Construction Company, Indianapolis, Ind., for the construction of an engine house and annex at Indianapolis. The annex will be 60 ft. wide by 150 ft. long and one-story high; the engine house 110 ft. long, and will have 10 stalls. Both buildings will be of brick construction with reinforced concrete foundations.

PHILADELPHIA & READING.—This company has let contracts for the grading and masonry in connection with the construction of third and fourth tracks between Belle Mead, N. J., and Manville, to Richards & Gaston, Inc., New York. Contracts for bridge superstructures have been let to the Phoenix Bridge Company for bridges east of Belle Mead, N. J.; west of Hamilton and east of Weston, and to the American Bridge Company for a bridge west of Weston. A contract has also been let for grading north and south of Saucon creek, South Bethlehem, Pa., to C. P. Bower, Philadelphia, Pa.

A contract has been given by the Philadelphia & Reading to Seeds & Derham, Germantown, Philadelphia, Pa., for building the new Columbia bridge over the Schuylkill river at Belmont, Philadelphia, on the main line. This will be a four-track concrete arch bridge, with eight arches of about 103 ft. span each.

ST. PAUL UNION DEPOT COMPANY.—A contract has been awarded by this company to Morris, Sheppard & Dougherty, St. Paul, Minn., and the George J. Grant Construction Company, acting as one corporation, for the construction of the new St. Paul passenger terminal. The contract covers the construction of the headhouse, the grading for the elevation of passenger tracks, the building of retaining walls, the relocating of tracks, etc. The estimated cost of the project is \$4,500,000, and the work is being done on a cost plus percentage contract. Work has already been started, and it is expected that the head-house will be finished by the latter part of December, 1918.

WABASH.—This company, the city of Moberly, Mo., and the Missouri, Kansas & Texas, are contemplating the construction of a viaduct over Rollins street, Moberly. The negotiations for the building of the viaduct have extended over a period of several years, and just recently the Missouri Public Service Commission has taken up the matter. Although it is expected that a decision will soon be reached, nothing definite has yet been determined.

YOUNGSTOWN & NILES.—This company has awarded a contract to the Republic Railway & Light Company, engineering department, for the construction of a road between Youngstown, Ohio, and Niles, a distance of seven and one-half miles. The line will be built on private right of way, and will traverse the new town of McDonald, which is being built by the Carnegie Steel Company.

Railway Financial News

BUFFALO, ROCHESTER & PITTSBURGH.—Five per cent equipment trust certificates to the amount of \$1,600,000 have been issued and will shortly be offered to the public by the bankers who have bought them; Tilney, Ladd & Co., of New York; Graham, Parsons & Co., Philadelphia; Colgate, Parker & Co., Philadelphia.

MARSHALL & EAST TEXAS.—This road is to be sold by order of the United States District Court on September 4. The upset price is \$675,000. The sale will be held in Marshall, where the general offices are located. This railroad runs from Wimsboro, Tex., southeast to Elysian Fields, a distance of 92 miles. It is controlled by a syndicate of St. Louis men, headed by A. T. Perkins, of that city. It is expected that it will be bought in, and that, after a reorganization, steps will be taken to extend the line into Louisiana.

PITTSBURGH, SHAWMUT & NORTHERN.—Receiver F. S. Smith has applied to the New York State Public Service Commission, Second district, for approval of receivers' certificates to the amount of \$1,700,000, needed to pay off receivers' certificates about to mature.

SAVANNAH & ATLANTA.—William Morris Imbrie & Co. have announced that the Georgia Railroad Commission has approved the proposed issue of \$2,500,000 6 per cent convertible first and consolidated mortgage bonds of the Savannah & Atlanta Railway, dated July 16, 1917, and due May 1, 1935. The bonds are part of an authorized issue of \$5,000,000. The bonds have been underwritten by a syndicate of New York bankers, and they will shortly be offered to the public.

AUSTRALIAN RAILWAY EMPLOYEES.—The average number of employees in the service of the Government Railways of Western Australia during the year 1916 was 7,703, as against 7,918 for the year 1915. Salaries and wages amounted to £1,247,491 (\$6,062,806), a decrease of £29,969 (\$185,650) compared with the previous year. During the year an increasing number of the staff volunteered for service with the Australian Expeditionary Forces, the total from the railway service being 1,499 up to the date of the latest report. The roll of honor shows that 51 have been killed in action or died of wounds.

RAILWAY DEVELOPMENT IN SPAIN.—Spain commenced to build railroads in 1840, and at the beginning of 1916 there were 8,700 miles of track. Up to 1915 the state had contributed \$139,000,000 for railway construction. The street railways of Spain have about 600 miles of track, of which 460 miles utilize electric power, 95 miles steam power, and the remainder horses and mules. In 1916, 85.62 miles of track were built, a small increase in proportion to the rapid growth of Spain's industrial and commercial activity. The new lines are from Irun to Elizondo, 31.07 miles; from Haro to Ezcarey, 19.88 miles; from Trozas de Orusco to Mondejar, 19.26 miles; a section of the road from Malaga to San Fernando, 8.70 miles; from Sarría to Vallvidrera, 3.11 miles; and a few other short additions.

RAILWAY DEVELOPMENTS IN THE RUSSIAN CAUCASUS.—The British consul at Batum reports that railway construction proceeded apace in the Caucasus in 1916. The Tabriz-Julfa Railway, with its branch from Sofan to Sherefkhani on Lake Urumiah, was completed and opened to traffic about the middle of the year. The Shahtakhti-Maku-Bayazet, or Alashkert Railway was also working as far as Bayazet before the close of the year. This line is now being extended southward in the direction of Lake Van. The Batum-Trebizond Railway was begun about August, 1916, and by the end of the year work on several sections of the railroad was reported to be advancing favorably. The Baku-Julfa, or Araxes Valley Railway progressed fairly rapidly, and much work in connection with earth-works and bridging was completed. Progress was also made during the year with the work on the Novo-Senaki-Sukhum section of the Black Sea Coast Railway, which is to join the Tuapse-Armavir line at Tuapse.

Railway Officers

Executive, Financial, Legal and Accounting

S. G. Lutz, general traffic manager of the Chicago & Alton, has been appointed vice-president in charge of traffic, with headquarters at Chicago, and his former position has been abolished. Effective July 17.

Howard Elliott, formerly president of the New York, New Haven & Hartford, has been elected chairman of the executive committee of the Northern Pacific, with headquarters at New York. Mr. Elliott has been a member of this committee since July 1, as noted in the *Railway Age Gazette* of July 6, page 43. He retains his connection with the New Haven road as chairman of a committee in charge of intercorporate affairs of the New Haven. He also continues as a member of the Railroads' War Board, Washington, D. C.

John Mitchell Johnson, recently elected vice-president of the Missouri Pacific at Chicago, with such duties as may be assigned to him by the president, was born at Cincinnati, Ohio,

on May 13, 1845, and entered railway service as a station agent on the Indianapolis, Cincinnati & Lafayette, at Indianapolis, Ind., on January 1, 1871. On November 1, 1872, he was appointed general freight and passenger agent of the Cincinnati & Martinsville, which was later taken over by the Indianapolis, Cincinnati & Lafayette, and in 1875 became traveling auditor of the latter road. Later he was successively in charge of local freight traffic and assistant general freight agent at Lafayette, Ind. On January 1, 1883, he became associated with



J. M. Johnson

the Cincinnati, Indianapolis, St. Louis & Chicago, being placed in charge of freight traffic originating at Chicago and the Northwest. On February 20, 1884, he became assistant general freight agent of the Chicago, Rock Island & Pacific, and served consecutively until April 1, 1903, as general freight agent, freight traffic manager and third vice-president. From April 1, 1903, to November 1, 1907, he was assistant to the vice-president of the Gould Lines at Chicago. On the latter date he was elected vice-president, in charge of traffic, of the Missouri Pacific and the St. Louis, Iron Mountain & Southern, and later his jurisdiction was extended over the Denver & Rio Grande and the Western Pacific, with the title of vice-president in charge of traffic. His service with the Western Pacific were terminated on March 5, 1915, when that company passed into the hands of the receiver, and with the Denver & Rio Grande in November of the same year. On August 19, 1915, he was appointed chief traffic officer of the Missouri Pacific, and upon the reorganization of that road on June 1, 1917, was appointed director of traffic. On June 11, 1917, at his request, he was relieved of the duties and responsibilities of the traffic department, and was elected vice-president, as already noted.

Operating

J. B. Gorton has been appointed car accountant on the Denver & Rio Grande, with headquarters at Denver, Colo., succeeding E. M. Horton, retired on a pension.

A. W. Woodruff, assistant superintendent of the Union Pacific, with headquarters at Ogden, Utah, has been appointed superintendent of the Wyoming division, with headquarters at Cheyenne, Wyo.; H. L. Bell, superintendent of the Wyoming

division, has been transferred to the western division, with headquarters at Green River. Under a recent arrangement the two divisions between Ogden and Omaha, Neb., have been divided into three; G. E. Stevens, assistant trainmaster at Ogden, has been transferred to Evanston, Wyo.

L. B. Wickersham has been appointed general superintendent of the electric lines of the Norfolk Southern, with office at Norfolk, Va., vice L. D. Mathes, resigned on account of ill health.

C. E. Brooks, assistant superintendent on the Oregon Short Lines at Nampa, Idaho, has been appointed superintendent of the newly created Montana division, comprising that part of the Oregon Short Line from Pocatello to Silver Bow and branches, with headquarters at Pocatello.

W. Van Valkenburgh, general baggage and mail agent of the Long Island Railroad at Long Island City, N. Y., has been appointed camp general agent of the American Railway Association and of the Long Island Railroad, with headquarters at Camp Long Island, Yaphank, N. Y.

F. N. McPhee has been appointed trainmaster of the San Joaquin division of the Southern Pacific, with headquarters at Bakersfield, Cal., succeeding J. C. Muir; J. E. Enger has been appointed trainmaster of the Portland division, with headquarters at Roseburg, Ore., succeeding F. Hanssen, resigned.

M. W. Sullivan, trainmaster of the Delaware & Hudson at Oneonta, N. Y., has been appointed superintendent of the Champlain division, with office at Plattsburg, N. Y., in charge of the territory from the North Yard limit board at Whitehall, N. Y., to and including Rouses Point; also the Baldwin, Ticonderoga, Anasable, Mooers and Chateaugay branches.

W. C. Ennis, trainmaster on the Chicago, Milwaukee & St. Paul at Spokane, Wash., has been appointed assistant superintendent of the Rocky Mountain division, with headquarters at Three Forks, Mont.; T. J. Hamilton, district master mechanic at Tacoma, has been appointed assistant superintendent of the Missoula division, with headquarters at Avery, Idaho; F. C. Dow, assistant trainmaster at Mobridge, S. D., has been appointed trainmaster at Tacoma; A. E. Campbell, trainmaster at Malden, Wash., has been transferred to the Idaho division; J. P. Phelan, trainmaster at Missoula, Mont., has been transferred to Malden, Wash.

Traffic

J. Brinker has been appointed express and mail traffic manager of the Atchison, Topeka & Santa Fe, with headquarters at Chicago.

Harold K. Faye, assistant in the office of the vice-president in charge of traffic, of the Chicago, Burlington & Quincy at Chicago, has been appointed traffic manager of the Western Pacific, with headquarters at San Francisco, Cal., succeeding J. T. Hendricks, resigned to enter private business.

Engineering and Rolling Stock

F. P. McDonald has been appointed master mechanic of the Stockton division of the Southern Pacific at Stockton, Cal., succeeding A. D. Williams, promoted.

G. E. Cessford, district master mechanic on the Chicago, Milwaukee & St. Paul, at Deer Lodge, Mont., has been transferred to Tacoma, Wash., succeeding T. J. Hamilton, promoted.

Samuel R. Parslow, who has been engaged in mechanical valuation work for the Great Northern for the past two years, has been appointed shop superintendent at Great Falls, Mont.

O. H. Mann has been appointed engineer maintenance of way of the Northern division of the Chicago Great Western, with headquarters at St. Paul, Minn., succeeding W. J. Calvin, resigned.

George C. Christy, general foreman at the McComb (Miss.) shops of the Illinois Central, has been appointed master mechanic, with headquarters at Vicksburg, Miss., succeeding C. Linstrom, deceased.

H. L. Needham, general foreman of the locomotive department of the Illinois Central at Twenty-seventh street, Chicago, has been appointed master mechanic of the Springfield division, with headquarters at Clinton, Ill., succeeding William O'Brien,

assigned to other duties. J. Ormsby has been appointed general foreman in the locomotive department at Twenty-seventh street, Chicago, effective July 16.

F. B. Tapley, who has been appointed assistant engineer of maintenance, all lines, of the Canadian Government Railways, with office at Moncton, N. B., as has already been announced in these columns, began railway work in 1903 with the Canadian Pacific as rodman, and later served consecutively as transitman, resident engineer and assistant engineer with the engineer of maintenance of way, and in the general manager's office at Montreal, Que. In July, 1916, he resigned from the Canadian Pacific to become assistant engineer in the office of the chief engineer of the Canadian Government Railways at Moncton, N. B., which position he held until his appointment as assistant engineer of maintenance, all lines. This position was recently created in connection with a re-organization of the engineering department.

F. G. Grimshaw, whose appointment as superintendent of motive power of the New Jersey division of the Pennsylvania Railroad, with headquarters at New York, has already been



F. G. Grimshaw

announced in these columns, was born on November 26, 1878, at Paterson, N. J., and was educated at Cornell University. After serving for one year in the Cooke Locomotive Works, he entered the service of the Pennsylvania Railroad in 1902 as special apprentice in the Altoona machine shops. From 1905 to August, 1906, he served successively as yard clerk and assistant yardmaster on the Pittsburgh division, and then was appointed assistant master mechanic of the Monongahela division. In June, 1907, he was appointed master mechanic on the West Jersey & Seashore, serving in that capacity until September, 1912, when he was appointed assistant engineer of motive power on the Western Pennsylvania division of the Pennsylvania Railroad at Pittsburgh, Pa. In November, 1914, he was transferred to Philadelphia as assistant engineer of electric equipment, and now becomes superintendent of motive power of the New Jersey division of the same road, as above noted.

Railway Officers in Military Service

W. M. Vandersluis, signal engineer of the Illinois Central at Chicago, has been commissioned captain in the Engineer Officers' Reserve Corps, but has not yet been assigned to duty.

H. T. Douglas, Jr., chief engineer of the Chicago & Alton at Chicago, has been commissioned major in the Engineer Officers' Reserve Corps; R. A. Cook, valuation engineer, and J. W. Reid, bridge engineer, have been commissioned captains in the Engineer Officers' Reserve Corps; P. J. Watson, Jr., assistant engineer at Bloomington, Ill., who was granted a leave of absence to enter the officers' reserve training camp at Ft. Sheridan, has been commissioned captain and assigned to Ft. Leavenworth, Kan.

OBITUARY

William R. Morrison, vice-president of the Gallatin Valley and for many years head of the insurance department and the railway mail service of the Chicago, Milwaukee & St. Paul, at Chicago, died at his home in that city on July 20.

Charles E. Kingston, formerly from May, 1912, to December, 1916, assistant general freight agent of the Philadelphia, Baltimore & Washington, at Philadelphia, Pa., and later special agent of the same road, died on July 21 at his home in Ridley Park, Pa., at the age of 59.

Railway Age Gazette

Volume 63

August 3, 1917

No. 5

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GENERAL NEWS SECTION.....

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One of the questions which is presented to the engineering department frequently when considering the construction of a second track is that of the advisability of reducing the grade at a certain point to the standard prevailing on the remainder of the division or of building the second track on the existing heavy grade and installing helper engine service at this point. This problem is usually susceptible of fairly accurate analysis on the basis of the traffic existing at the time the estimate is made. The cost of reducing the grade on the present location or by means of an alternate line and the increased fixed charge which will result from the improvement can be determined with a reasonable degree of accuracy. One can also estimate the cost of helper engine service on the basis of present traffic and operating conditions so that a comparison of the two methods can be made easily. It is in looking to the future, as one must in planning an improvement of considerable magnitude such as this that difficulty is experienced. No particular trouble is presented in computing the cost of the alternate low grade line, for once the expenditure is made the fixed charges are constant. There is much more uncertainty in estimating the future cost of helper service. In the first place, the cost of this service varies with the amount of business handled until the capacity of the line is approached, when it rises rapidly. It is difficult to predict this future development of traffic, it being under-estimated more frequently than otherwise. Even more careful consideration must be given to tendencies affecting the cost of helper engine service itself. The experience of the past year has illustrated the fact that the demands of train service employees both for higher wages and for more costly working conditions are increasing continually. It is, therefore, safe to assume that the expense of this service, at least insofar as the wages of employees are concerned, will increase more rapidly than the business. These conditions constitute a strong argument for the construction of low grade lines even where the first cost is considerably greater than the capitalized cost of helper service under present conditions. Such construction eliminates the uncertainties which surround the future cost of helper service.

The Increasing Cost of Helper Service

How many mechanical engineers and designers consider the electric lighting equipment when laying out the trucks, brake rigging and underframe of a new passenger car? Very few; yet the axle generator with its accessories certainly plays an important part in the successful operation of the car in service. The most unreliable part of the axle generator equipment is the belt; this is not the fault of the belt itself, but of the makeshift installation because of no provision being made for it and its pulleys when designing the car. The best results can be obtained by using a large axle pulley about 20 in. in diameter with a wide face, about 10 in. This pulley, particularly with body mounted machines, should be located at the center of the axle to reduce belt distortion when on curves. So much for the ideal. In practice it is usually impossible for the electrical department to specify an axle pulley that would give the longest belt life and fewest light failures; it is simply a case of making the best of the situation by specifying a pulley with standard bore and width and with the largest diameter possible. Under these conditions axle pulleys, from 14½ in. to 21 in. in diameter and from 7 in. to 10 in. face have had to be used. The diameter most used is the 17 in., which is 3 in. less than it should be. Both the Master Car Builders' Association and the Association of Railway Electrical Engineers have adopted standard generator pulleys for the two types of axle machines, but because of the common practice of paying no attention to the axle equipment when designing the car, it has been impractical to adopt a standard diameter for the axle pulley. More co-operation between the mechanical and electrical departments will not only make such a standard possible, but will result in better belt performance, fewer light failures and will do away with any friction between the two departments growing out of the lack of such co-operation. It will be to the best interests of the railroad freely to consult the electrical engineer on the design of new cars and to incorporate as many of his suggestions having to do with adapting the trucks, brake rigging, etc., to the electrical equipment as are practicable.

* Illustrated.

THE EMPLOYMENT OF WOMEN

THE steady increase in the employment of women in all kinds of industrial and commercial activities throughout the civilized world in the course of economic evolution has been taken so much as a matter of course by the public in recent years that the sudden introduction of women into lines of work in which they have not previously been engaged has not excited any particular concern, and it has been generally supposed that the change can be made with but small administrative effort. Experience gained thus far has shown, however, that obstacles will be encountered, which, while they may be trivial in most cases, must be disposed of correctly before the step can be taken with success.

The question of compensation is important. While women are commonly paid less than men in classes of work in which their employment has been thoroughly established, it has been the recent experience in Canada that the substitution of women for men as a war measure is less liable to upset labor conditions if women are paid the same scale as the men. The employment of women also has a social aspect which must receive careful study. When engaged as machine operators or day laborers women are thrown into coarser surroundings and into contact with men who are not accustomed to the association of women in the status of fellow employees and instances have been reported where it has been necessary to discipline a few of the men because of a failure to show proper respect.

One feature which may be overlooked is the provision which must be made for toilet facilities before women can be put to work. As an indication of what this means it may be mentioned that estimates made on one road for accommodations for women to be employed in car and locomotive shops demonstrated that expenditures in excess of \$10,000 would be required. It is not alone a question of the amount of money involved but the character of the accommodations necessary deserves careful consideration. Rest rooms must be provided and in general the facilities must be of a higher grade than the crude accommodations which in many cases have been considered adequate for men, for in the words of one railroad president "the standards of womanhood in this country must not be lowered."

This situation presents new problems and therefore should receive careful study before expenditures are made.

TRANSCONTINENTAL RATES

THE Interstate Commerce Commission has again ordered a readjustment of transcontinental freight rates as to the relation between rates to the Pacific Coast terminals and those to the intermediate intermountain territory, but instead of attempting to deal permanently with the situation has based its decision on conditions admittedly temporary, whose change will require another adjustment.

The commission finds that, because of the war, existing water competition with the rail lines for traffic between the Atlantic seaboard and Pacific Coast terminals is a negligible factor and that rates to the Pacific Coast from the east lower than the rates on like traffic to intermediate points are, therefore, not justified under existing circumstances. We thus enter upon another chapter in the complicated history of the controversy between terminal and intermountain communities which has raged for some 25 years. As the cessation of traffic through the Panama Canal because the ships are being used elsewhere on account of the war is the reason for the new order, the chances are that it will continue for at least as long as any of the various previous adjustments, but it seems rather regrettable that the opportunity has been missed to settle on a policy for transcontinental rates based on more permanent conditions.

In a former report dealing with the transcontinental rate situation, although the carriers urged that the prospective opening of the Panama canal and its effect on the rail

rates be taken into consideration, the commission declined to do so, and it became necessary for it to do much of its work over again after the canal was opened. In this case the carriers asked the commission not to confine its consideration to the temporary circumstances, but to look to the future and recognize the permanency of the condition created by the opening of the canal route. The commission does not fail to recognize some force in the argument, but it deals with the situation that exists for the time being.

The carriers will probably profit, at a time when they can make good use of the money, by the temporary advancing of rates to the Pacific Coast required by the order to realine them to accord with the provisions of the long and short haul rule so that they will not be less than the rates on like traffic to intermediate points. In spite of this fact, however, the carriers vigorously opposed such an order at the time of the oral argument on the tentative report, because of the disturbance it would create in the long established relations between the terminal and intermediate points during the meantime.

MAINTENANCE OF WAY CONVENTIONS

AS the time approaches for the fall conventions of three of the maintenance of way associations, there is much discussion of the advisability of holding the meetings this year. Some maintain that, because members will have difficulty in getting away from their work long enough to attend, the attendance will be greatly reduced, and that, therefore, the meetings should not be held. Others contend that because of the new and serious problems which are confronting the members of these associations this year, there is more than the usual value to be derived from the meetings with their opportunities for the exchange of information.

The Roadmasters' Association convention is scheduled to be held in Chicago, beginning September 18. At a meeting of the executive committee of that organization three weeks ago, the opinion prevailed that the convention should be held at the time and place originally agreed on. It was decided to reduce the time from the customary four days to three days, to eliminate practically all entertainment for the members and to revise the program radically to make it of the greatest practical benefit to the members at the present time. Addresses of welcome and other time-consuming formalities have been eliminated. Several reports, which are not of immediate timely interest are to be replaced with papers and reports on various phases of the labor and material situations as they now exist. The executive committee of the Bridge and Building Association held a meeting last week at which similar action was taken regarding the convention of that society, scheduled to be held in St. Paul the third week in October. The place of meeting was changed to Chicago to make it more central for the members and to avoid placing a transportation burden on any one or two railroads. The Maintenance of Way Master Painters' Association has also decided to proceed with its convention at Cleveland the third week in October.

There has been a strong tendency to call off the conventions of the various railway associations since the United States entered the war. In those fields in which few, if any, special problems have arisen this action may be advisable, but in those branches of railway service such as the maintenance of way department in which new and highly important problems have been presented which demand solution, there has never been a greater need for association work with its possibilities for united discussion and the exchange of ideas. Difficult as it may be for a man to leave his work under existing conditions, the very fact that he is so handicapped makes it all the more necessary that he avail himself of the opportunities to learn of better methods whereby he may conserve the forces and materials he has. Many of the problems which are now giving so much trouble

have arisen so recently that there has been no chance for other than individual study. If, therefore, these associations ever had an opportunity to be of real service to their members, this is the time.

By revising the programs to make them more applicable to the present problems, these associations are endeavoring to rise to the occasion. Instead of a smaller attendance at these conventions this year, it should be larger because of the greater demand for the information which will be brought out. Railway officers can do well to encourage their men to attend these meetings, for if a man goes to them with serious intentions, the results will be reflected in his work.

FREIGHT CAR EFFICIENCY

SOME roads have been inclined to complain whenever their percentage of equipment on line has been less than 100 and to point out that they could have served their local shippers much better if their cars had not been scattered on other roads. Many of such complaints entirely overlook the fact that about the only time an originating road ever had 100 per cent of its equipment was at a time of depression when there was a general car surplus. Many roads that have cited figures to show that they have been able to supply only a certain percentage of the requirements of their shippers have actually loaded more cars and done more business than ever before.

To illustrate the fact that the percentage of cars on line is of less importance in indicating the condition of a railroad than has sometimes been attached to it, some interesting figures have been compiled for five typical roads, with a view of determining relative service to the public and of ascertaining what per cent of car ownership produced best operating results as gaged by average miles per car per day. For this purpose figures for two leading railroads in the east, classified as delivering lines, and three leading central western lines, classed as originating or producing lines, were taken, showing the percentage of cars on line and the average car movement per day for a two-year period from April, 1915, to March, 1917, inclusive. From these were selected the average for the six months when the greatest car mileage per day was made for comparison with the six months when the poorest mileage showing was made. The results were as follows:

DELIVERING ROADS			
	Per Cent Cars on Line	Average Miles Per Car Per Day	Increase in Total Car Miles
No. 1	107.5	18.3	28.0%
	133.7	11.5	..
No. 2	135.7	19.7	5.0
	153.4	16.6	..
ORIGINATING ROADS			
No. 3	76.7	38.5	13.4
	96.4	27.0	..
No. 4	94.6	28.4	9.0
	102.4	24.0	..
No. 5	60.4	37.1	3.4 Dec.
	82.4	28.4	..

In each case the greater mileage per car per day was made when the percentage of cars on line was less.

These statistics also give an indication of the often-repeated statement that car shortages are by no means necessarily caused by a lack of cars so much as by a shortage of other facilities for handling freight promptly, including not only railroad facilities but those of shippers and consignees for loading and unloading. The ability of a delivering road to serve the public depends not only on the facilities which it has provided but also on the ability of consignees to promptly dispose of the freight delivered to them, so that cars may be released and that room may be made for others. The figures cited for the two eastern roads show that they were able to make a fair average mileage per day with from 107 to 135 per cent of cars on their lines but that when this percentage increased the movement was slowed up. It is a well-known fact that much of the congestion during the past few months has been due to the inability of eastern consignees, especially at the seaports, to handle the freight deliv-

livered to them, with the result that eastern lines first became congested and the congestion backed up until its effects were felt even west of the Twin Cities.

THE B. OF R. T. STRIKE IN CHICAGO

THE strike in the Chicago terminals last week of switchmen belonging to the Brotherhood of Railroad Trainmen will harm not only that organization but the entire cause of organized labor. Probably it was condemned by the members of labor organizations generally and especially by a majority of the members of the railway labor brotherhoods. It was unwise from the standpoint of organized labor because of the gross disregard of the public welfare which it showed and because those who called it so greatly over-estimated the strength of the strikers that it was practically lost by them when officers of the other three large labor brotherhoods intervened and suggested a plan of settlement which, with some important modifications, finally was accepted by the roads. While, however, the strike doubtless was condemned by most members of the railway brotherhoods, it was entirely consistent with the action taken by the heads of all the four large brotherhoods in calling a strike on all the railways last spring when the Adamson law case was pending in the Supreme Court.

The representatives of the Brotherhood of Railroad Trainmen in Chicago simply seized upon a time when, as they supposed, the railways were in a vulnerable position, to wring from the roads concessions which could not be secured at any other time. All the railways of the country are obliged to exert themselves to the utmost to handle the vast traffic now moving. A large part of this traffic passes through the Chicago terminals, and at present includes much military traffic for the government. The brotherhood leaders in Chicago apparently believed that the railways would concede almost anything to avoid an interruption of traffic through that city and therefore that if a strike were called it would be quickly won. The railways charged that the strikers, in effect, demanded the closed shop on roads with which the Brotherhood of Railroad Trainmen had contracts, and also tried to establish the principle that members of their organization must be promoted to assistant yardmasters and yardmasters in preference to other persons. The spokesmen for the Brotherhood of Railroad Trainmen deny this and say that the demands they made were reasonable; that they were made only to protect members of the organization against discrimination, and could have been granted by the railways without doing any harm.

The demands speak for themselves. One of them was that "in the employment of yardmen the B. of R. T. men shall be given preference." This would not absolutely restrict railways having contracts with the B. of R. T. to the employment of members of this organization, but it is evident that under it they could not employ men not belonging to this organization without constant friction and danger of strikes. The Managers' Conference Committee offered a rule providing that there should be no discrimination against members of the Brotherhood of Railroad Trainmen.

Another rule for which the B. of R. T. asked was that "yardmen discharged can only be reinstated by mutual agreement between officers of the company and the properly authorized committee representing them." Since on a road having a contract with the Brotherhood of Railroad Trainmen the committee of this organization would be the only one representing the men, it is clear that a man who did not belong to this organization would have much difficulty if he were discharged in ever getting back into the service. Under the operation of these two rules it would not be long until on any road having contracts with the B. of R. T. there would be no yardmen in the service not belonging to this organization. There may be a distinction, but there is no substantial difference between such an arrangement and the closed shop.

Finally, it was demanded that "in the employment of yardmasters and assistant yardmasters senior qualified yardmen shall be given preference." This rule would support the other two rules in making effective the closed shop; and it would undermine discipline and efficiency by setting up previous employment and seniority instead of special fitness as the qualifications for official positions. Why should preference be given to yardmen rather than to yard clerks or trainmen, if the latter are considered as fit or more fit than the yardmen?

It was to force the acceptance of these novel and unreasonable rules that the representatives of the Brotherhood of Railroad Trainmen in Chicago on Friday morning ordered a strike to begin at six o'clock on Saturday morning. To call a strike to secure the adoption of such rules when the Managers' Conference Committee already had suggested mediation by federal authorities would have been bad enough in any circumstances. To call it when the country was at war and needed the service of every railroad yard, track, locomotive, car and employee showed a seeming want of regard for the public welfare and a lack of patriotism that are difficult to understand.

The responsibility for the strike does not rest entirely upon the officers of the Brotherhood of Railroad Trainmen. It rests also upon Congress. Congress was warned last September that developments of this kind were likely to occur unless a law to prevent them was passed. Congress was shown beyond question last spring that this warning was well founded, when under still more serious conditions a strike was ordered by the heads of all the four railway brotherhoods. Congress, however, refused to act to protect the public and in consequence we have now actually seen a strike put into effect in Chicago by representatives of one of the brotherhoods. Is any more conclusive demonstration needed of the proposition that this country will not be safe from serious railway strikes during the war unless legislation is passed to prevent them?

STATE REGULATION INTERFERES WITH RAILROAD EFFICIENCY

A FEW days after war was declared the chief executives of the railways met at Washington and formed an organization for the purpose of operating all their facilities in such a way as to help the nation to the utmost in the struggle which it had entered. Those who have during recent years followed closely developments in the field of railway regulation anticipated that some of the most serious obstacles encountered by railway managements in accomplishing this purpose would be interposed by state railway commissions.

Unfortunately, the regulating commissions of some states are justifying the uncomplimentary apprehensions expressed regarding them. E. P. Ripley, president of the Atchison, Topeka & Santa Fe, has written a letter to the Chicago Tribune in which he calls attention to the situation with respect to minimum carload weights, and the attitude which has been assumed regarding it by some state commissions, and especially that of Kansas. The Public Utilities Commission of Kansas has refused the application of the Kansas lines for leave to advance the minimum carload of flour and other grain products from 24,000 to 40,000 lb. "In the western rate advance case in 1915," as Mr. Ripley says, "the Interstate Commerce Commission permitted an advance of this minimum to 40,000 lb. on interstate shipments throughout the states of Illinois, Wisconsin, Minnesota, North Dakota, South Dakota, Colorado, Nebraska, Iowa, Kansas, Missouri, Arkansas, Louisiana, Texas, Oklahoma, and New Mexico. But in the states the carriers have not been able to secure like advances; and this is called to your attention as an illustration of the impossibility in practice of getting anywhere with transportation in this country as long as states are thus able to block the way. Even the load of 40,000 lb.

which the commission in the western advance case authorized the carriers to require for interstate movement, is really only half a load, for it was shown during the trial of that case that flour and other grain products for export load from 70,000 to 85,000 lb. In the interest of efficiency the carriers have increased the power of their locomotives and the carrying capacity of their cars, but their efforts have been balked by the toadying of politicians on state commissions to the selfishness of shippers, who insist upon the privilege, at the expense of the commercial and industrial interests of the United States, of buying only a third of a load of flour at a time."

Mr. Ripley contrasts the minimum weight fixed by the Interstate Commerce Commission with those which have thus far been kept in effect in a number of western states. The figures for ten of these states are as follows:

	Pounds		Pounds
Illinois	24,000	Missouri (flour)	24,000
Minnesota	30,000	Missouri (other products) ..	30,000
South Dakota	30,000	Arkansas	24,000
Nebraska	24,000	Oklahoma	24,000
Iowa	24,000	New Mexico	30,000
Kansas	24,000		

Continuing, Mr. Ripley says: "When it is considered that the average equipment of today will carry about 60,000 and most of it 80,000 lb. and over, the minimum of 24,000 lb. which the state of Kansas refuses to advance is nothing less than an outrage upon investors, a gross discrimination against shippers furnishing large loads, and in this time of war such an 'aid and comfort' to the enemy as to be really treasonable.

"Wisconsin allowed an advance to 40,000 lb. the other day, and recently Minnesota granted a miserly advance from 26,000 to 30,000. Kansas denies any relief. And there you have the conflict and confusion which beset us everywhere."

As Mr. Ripley says, applications for increases in carload minimums are pending in Illinois, Iowa, Nebraska and many other states, but while the need for action is acute and will become much more so within a few months, most of the state commissions seem indisposed to do anything. Their members apparently are thinking more about how some of their influential constituents may feel concerning an advance in minimum weights than they are about the things that need to be done to enable the United States and its allies to win the war.

Mr. Ripley illustrates the great increases in railroad efficiency which might be secured if only the railroads were allowed to adopt the measures necessary adequately to increase carloads. He says: "In the last year the Santa Fe handled 56,512 carloads of flour and other grain products, which loaded on an average about 39,000 lb., the larger load of the interstate movement having been pulled down in the average by the smaller loads in the states. Had this average load of less than 39,000 lb. been increased by 11,000 lb. and made merely a fair load of 50,000 lb., the Santa Fe would thereby have saved for other transportation uses and for other shippers about one car out of four—that is, in moving 56,512 shipments of grain products it employed about 14,000 cars more than were necessary for that transportation. What a stupendous waste for only one carrier on only one commodity! What I say about grain products is true in varying degrees of many other commodities moving in large quantities."

A statement of facts such as that made by Mr. Ripley is the severest indictment that can be drawn against our dual system of regulation of railways. There seems to be little ground for hoping that state regulating authorities will ever become intelligent and public-spirited enough to put the welfare of the country as a whole above the supposed interests of the people of their own states. Apparently the only remedy for the unsatisfactory conditions to which regulation of the railways by both the state and federal authorities gives rise is the abolition of state regulation.

Letters to the Editor

THE NEW IMPACT FORMULA

CHICAGO, Ill.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The American Railway Engineering Association adopted a new impact formula for the design of railway bridges at its last annual convention. This formula is

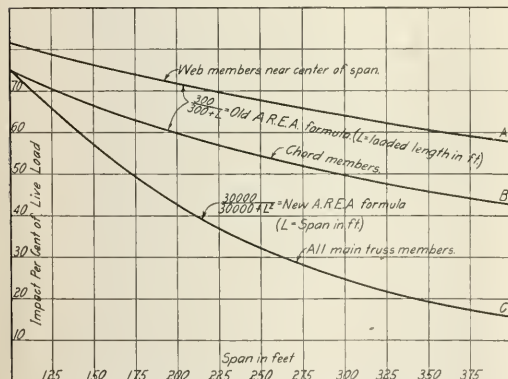
$$I = \frac{30000}{30000 + L^2}$$

In which I = the fraction of the live load stress to be added to provide for impact and L = length of the span in feet. The old impact formula, which is a part of the specifications for bridge design adopted by the Association in 1912, and which has been widely used is

$$I = \frac{300}{300 + L}$$

in which I = the fraction of the live load stress to be added to provide for impact, and L = length of loaded track on the span in feet. A comparison of the per cent of live load allowed for impact by these formulas is shown in the diagram for spans from 100 to 400 ft.

An essential difference in these formulas is found in the meaning of L . In the new formula L is the length of span for all main truss members except those whose sole func-



Graphical Comparison of the Formulae.

tion is to support floor beams, while in the old formula L equals the length of loaded track required to produce the maximum live load stress in the various members. Thus, for end posts and chords L is practically the span length in both formulas, but for web members, the value of L in the old formula varies.

The impact produced by rolling loads on railway bridges is not susceptible of vigorous mathematical analysis, and the results of experiments must therefore furnish the principal basis for an impact formula. However, there are certain theoretical considerations which should be satisfied and which are satisfied in the new formula, although its constants are the result of experiments. Theoretically L should be the total span length for all main truss members.

The impact on the trusses does not arise from the jarring effect of the rolling loads but from that part of the deflection of the entire truss caused, in most part, by the rhythmical application of the centrifugal force of the overbalance in locomotive drivers which sets the bridge to swinging in a

vertical direction. If the period of vibration of the entire bridge and its load is the same as the time required for one complete revolution of the drivers, the amplitude of swing of the bridge will reach a maximum, because each application of the centrifugal force, both upward and downward, then tends to increase the total deflection and this condition gives maximum impact on the trusses. Since the impact, causing deflection, produces maximum stress in *all* the members when the deflection is greatest, it follows that the impact is a function of the span length and L should therefore be used as the entire length of the span.

It is to be hoped and expected that this new formula will meet with the approval of engineers generally and that it will be used to an extent justified by its adoption by the American Railway Engineering Association and by the great number of experiments and the large amount of work devoted to its development. It is easy of application, since the same factor applies to all main truss members; and, moreover, it results in a slight economy in the weight of steel in the bridge. The reduction of weights resulting from its use instead of the old formula in a span of 175 ft. designed for Cooper's E-50 loading is about 10 per cent in the trusses and less than 6 per cent for the entire bridge. In longer spans the weight of steel required to provide for dead load increases faster than that required for live load, so that the percentage of economy tends for this reason to decrease as the span length increases. However, by reference to the diagram it is seen that the impact as given by the new formula decreases faster as the span increases than that given by the old, so that the saving in weight tends to increase for that reason. For spans of from about 150 to 400 ft. the economy from using the new formula for the trusses instead of the old will amount to approximately 5 per cent of the entire weight of the bridge.

The experiments upon which this new formula is based and the work of its development was performed by the subcommittee on Impact and Secondary Stresses of the Committee on Iron and Steel Structures of the American Railway Engineering Association of which Prof. F. E. Turneaure is chairman, and to him and to Prof. C. L. Crandall the credit is due in great part.

A. C. IRWIN,
Engineering Department, Chicago, Milwaukee & St. Paul.

TRANSVERSE FISSURES

ST. MARVS, Pa.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The transverse fissure problem as presented by James E. Howard in the report of the Interstate Commerce Commission, an abstract of which is published in *The Railway Age Gazette* of March 23, and the comments made on the article in the issue of May 25 by John D. Isaacs are very interesting. The examination of rail failures is not carried to a conclusion in many cases. One seldom hears of transverse fissures or broken rails being produced on bridges or perfect foundations where the ties are close together and in perfect surface. The larger percentage of examinations of transverse fissures are made after the rails have broken, causing more or less damage to the road bed from which little, if anything, can be learned after the track bed had been torn up by derailed cars or locomotives.

Much time and money has been expended in trying to solve this problem without taking into consideration the outside influences that bear on the problem; such as flat wheels (of which there are thousands running, some for a very short time and others for days before they are removed, in which time they may do considerable damage when the condition of the track and the flat spot form the proper combination) alternating soft and rigid spots in the track, ties spaced too far apart (irregular spacing) and the cold rolling process that takes place.

There are many bad track conditions of apparently slight significance to the track walker and which he would have

difficulty in finding that can contribute to the transverse fissure condition. It is true that defective material plays an important part in some cases, but not all, or a good deal. Therefore, the logical conclusion is that Mr. Howard's report would be borne out if some of the actual conditions of wheels and track were made a part of the analysis as well as the rail. While it would cost considerable money to make tests under such combined conditions it would probably bring out some valuable data as to the transverse fissure.

E. F. GIVIN,

Mechanical Engineer, Pittsburgh, Shawmut & Northern.

THE VALUE OF RAILWAY CLUB ADVERTISING

SAN FRANCISCO, Cal.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

As one who has for many years been a constant reader of the *Railway Age Gazette*, a contributor of many articles to its pages, and an ardent admirer of its policies, I feel that I should be privileged to criticise your editorial of July 13, entitled, "Western Railway Club Drops Advertising"; and incidentally, as secretary of the Pacific Railway Club, to dispute some of its statements.

When it was decided to establish a forum for the presentation and discussion of subjects relating to construction, operation and maintenance, the executives of the Pacific Coast roads were a unit in expressing the belief that the most good could be accomplished by taking as models the highest types of professional societies: bar associations and medical societies. These societies admit to membership only persons who are actually practicing their professions, and I doubt if there can be found anywhere in this country a bar association that carries law-book salesmen on its membership roll, or a medical society whose roster boasts the presence of patent-medicine manufacturers. The Pacific Railway Club limits its membership to (a) persons actively engaged in railroad service, (b) in the service of a railroad regulatory body and who has had not less than three years' active railroad experience, (c) faculty members of colleges of recognized standing.

You will note that no place has been provided for supply salesmen or manufacturers. But the club membership does include the professors of railroad engineering and economics at our two universities, and we maintain a junior membership for college students in railroading and young men in railroad service who desire the use of the club as an educational adjunct. Thus we are endeavoring to make of our club something more than a mere gathering place for railroad men and supply salesmen.

The members of the Pacific Railway Club pay the highest dues paid by any railway club membership in the United States and Canada. The reason for this is that we have fewer men to draw our membership from and cost of operation is higher in the far West than elsewhere. If the club had to depend upon the dues paid by members for its support it could not afford to continue the publication of its official proceedings. That the contents of these proceedings have a distinct value is proved by the reprinting of some of the papers contained in them in no less an educational journal than the *Railway Age Gazette* itself.

If I may make the comparison: just as the *Railway Age Gazette* could not exist alone on the receipts from subscriptions and continue to provide the railroad world with the high-class service it is now giving, so the Pacific Railway Club could not do its share without advertising support.

As to the advertising value of our "Proceedings." We publish monthly a minimum of five hundred copies, each one of which goes into the hands of a railroad man who either specifies or purchases railway material, or who will at some future time specify railway material. That means 100 per cent circulation efficiency. For a half-page advertisement we charge less than postage on a circular letter;

one and a half cents per unit of circulation. For a full page advertisement, less than the cost of postage and printing of a circular letter; three cents per unit of circulation. The three advertising agencies who place most of your clients' advertising have approved our "Proceedings" as an advertising medium.

In view of the above, I think that you will agree with me that the Pacific Railway Club is asking nothing of the supply people for which it does not give full return. Medical societies carry the advertisements of medicines and appliances in their journals; bar associations advertise law books in theirs; why should not railway clubs take advantage of the value of their journals as advertising mediums and make the most of them?

If I did not know the high standards of your paper and the high type of journalists who operate it, I should be inclined to think that your management objected to the opposition of the club journals to your magazines as advertising mediums. I hope that you will give this communication the same publicity that you gave your editorial; this, in justice to such clubs as the Pacific Railway Club.

WILLIAM S. WOLLNER,
Secretary Pacific Railway Club.

MAN FORCE, CAPITAL AND TRANSPORTATION EFFICIENCY

EAST PITTSBURGH, Pa.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I have read, with much interest, your analysis and conclusions in the "The Decision in the Fifteen Per Cent Rate Case," published in your issue of July 6.

I would like to suggest that in addition to the matters you cover, showing a tendency toward a slowing down in development, there is another situation, also which the railroad managements cannot control, which may cause some tendency toward slowing down transportation accomplishment. Every manager senses always the delicate poise in which his organization is held, as between initiative and active, efficient endeavor on the one hand and a passive, just making good sort of an effort of the whole organization under him on the other. We are all very proud of the accomplishments of our railroad organizations. A new condition has been forced upon the railroads, however, which cannot do other than, at least in some degree, slow up their past enviable quality in this thing. The war is draining from the railroads large numbers of the "picked," long experienced, most highly efficient, employees. Their places will be filled by new employees. To a great extent a "shift" will be made, and vacancies filled by women. The most serious situation in this, however, is the fact that on account of war draining the country of its best, virile, young manhood, the railroads cannot recruit the same quality of employee as in former times.

The effects of this transition have not yet been felt. The question arises whether under the stressed conditions it will be possible for the managements to keep up the past quality of their organizations. Is it not fair to assume that this may easily affect organization development adversely to such a degree that the resulting difference between the virile, active, strong organization, and the weaker organization, may readily shift results to offset the small degree of net rate advance permitted? To me, the most obvious and the only remaining means of keeping the net organization results high requires placing a better tool, or more of them, in the poorer employees' hands. It would seem, also, that this is one of the legitimate situations that might likewise have been considered by the commission in its decision, but which does not seem to have been done. As man power efficiency comes down, capital requirement must go up, as the substitution to maintain at par the third value—transportation.

Q. M. HERSHEY.



Cantonment at Fort Riley, Kan., in Course of Construction

Railways Active in the Nation's Service

**Moving Government Supplies and Forces, Working on
Cantonments, War Posters, the Draft. Other Matters**

WASHINGTON, D. C., July 31, 1917.

PLANs for the solution of one of the most important transportation problems placed before the railroads by the war have just been adopted by the Railroads' War Board after a series of conferences with the authorized officers of the Army, Navy and the United States Shipping Board. The problem concerns the supply and expedited handling of the thousands of cars required by the government to transport lumber and other supplies to the shipbuilding yards, cantonments and other mobilization points, which movement has already assumed considerable proportions. During the next few months it is estimated that 100,000 cars will be needed for government purposes. The plans agreed upon are described in a bulletin issued by the Railroads' War Board to all railroads.

CAR SUPPLY AND MOVEMENT FOR GOVERNMENT SHIPMENTS

Arrangements have been completed under which advance notice will be given the Commission on Car Service whenever orders exceeding 10 carloads or 250 tons are placed for material or supplies and a form has been prepared for this use. Arrangements have also been perfected under which the authorized officers of the departments and the shipping board will issue car orders on another form to the railroads on which the supplies are to be shipped, instructing them to provide the number of cars ordered within the time specified and at the shipping points designated. These forms are to be furnished only where the ordinary means of securing cars have failed. They will be filed by shippers with the railroad agent at originating point and upon their presentation cars will be promptly furnished in accordance therewith. A record of cars furnished will be maintained on the back thereof. In case of inability to provide equipment promptly the railroad with which they are filed will communicate with the Commission on Car Service, giving date and number of order and by whom consigned.

To prevent shippers from utilizing for their own purposes cars needed for the government service, railroads are instructed that cars furnished on one of these orders must not be used except for the loading specified in the order. The

forms will be supplied to the departments interested and the railroads are directed to instruct all concerned as to their use. To assist further in keeping cars bearing government supplies moving without delay, a form of envelope in which the waybill is to be carried, similar to that shown in the illustration, is to be furnished by authorized officers of the departments and the Shipping Board to persons or firms making shipments of material for the use of the Army, Navy or the Shipping Board. These envelopes will show the following headings in large type: "United States Government," "United States Army Supplies," "United States Navy," "United States Shipping Board." Cars accompanied by these envelopes must be given continuous movement and must not be delayed.

In addition, railroads have been directed to instruct their agents at all points to stamp or write in a permanent place on waybills covering less than carload shipments consigned to officers or agents of the Army or Navy or of the Shipping Board the words "United States freight. Expedite." The stamp for this purpose should preferably be used at all stations of any size.

Railroads to which the car order or the waybill envelope is presented are to furnish cars and handle loaded cars in accordance with the instructions, regardless of the name of the consignee, inasmuch as the forms are only furnished by responsible officers of the Army, Navy and of the Shipping Board, who will undertake to prevent any abuse. If any doubt exists with reference to the propriety of the use of the waybill envelopes, the instructions state that the movement should be accomplished and the matter then taken up for investigation. The bulletin also states that if departments of the government or individual railroads desire to place cards of their own form upon cars to assist in securing continuous movement there is no objection to such practice.

RUSHING CANTONMENT MATERIALS

Over 12,000 carloads of lumber and other building supplies have been delivered by the railroads to the 16 cantonments that are to house the first division of men called to the

colors by the draft within 30 days from the date that the government placed the first orders for cantonment materials. When the cantonment work was first started C. E. Denney, assistant to the president of the New York, Chicago & St. Louis, was assigned as general agent in the office of Col. Littell of the quartermaster's department at Washington during the period of construction. Mr. Denney's work is to co-operate with the quartermaster's department to keep in touch with all phases of the construction work, track building, etc., and furnish advance information to the Commission on Car Service concerning the government's orders and the number of cars required to fill them. From his reports and those of the agents at the cantonments the Commission on Car Service is able to keep informed when and where cars will be needed and to make provision for furnishing them. To insure the prompt delivery of all cantonment supplies, railroads are giving preference to government shipments and the Railroad War Board has assigned an experienced railroad man as a general agent at each cantonment to work in co-operation with the constructing quartermaster. These agents make reports regularly concerning the number of carloads of material received, the number of cars unloaded, etc.

Additional trains, loaded to capacity with lumber, brick, piping, wire, poles, water mains and all the other materials needed to construct cities capable of accommodating 40,000 inhabitants, are arriving daily. These trains are swiftly unloaded and meanwhile other cars are placed at the supply points for new loads.

An indication of the speed with which the materials are being moved, and also the teamwork between the railroads, and the construction forces, is contained in a report from the cantonment at Louisville, Ky. The report states that one of the administration buildings there was built from lumber cut in a Mississippi pine forest the week before. The trees were felled on Saturday, kiln dried on Sunday, loaded on freight cars Monday and delivered at the Louisville site on Wednesday morning. An army of energetic carpenters speedily converted them into an administration building, completing the transformation from forest to government structure just one week from the day they had been felled.

Altogether 1083 carloads of lumber and 149 carloads of other supplies have been delivered at Louisville during the past three weeks, a total of 1232. At Petersburg, Va., 965 carloads of lumber and 431 carloads of other materials have been delivered, a total of 1396, at Ayer, Mass., 807 carloads of lumber, 532 of other materials, a total of 1339; at Fort Sam Houston 934 carloads of lumber, 612 of other materials, a total of 1546.

In order to reach many of the cantonment sites, the railroads have had to build branch lines from the nearest main line, at their own expense. It has also been found necessary to lay anywhere from 4 to 6 miles of additional trackage on each site to supply facilities for the local movement of materials necessary to the rapid progress of construction work.

MOVEMENT OF MILITARY FORCES

The railroads have been handling large numbers of troops and large quantities of supplies to the seaports for transportation to Europe for General Pershing's expeditionary forces and it is understood the various movements have been handled to the entire satisfaction of the War Department authorities. Details regarding these movements cannot, however, be published under the rules promulgated by the Committee on Public Information for the volunteer consorship under which newspapers and other publications have been operated. New regulations have been issued this week containing the general request that there shall be no published mention of the arrival of American troops or supplies at European ports nor information regarding train or boat movements of troops nor information tending directly or indirectly to disclose the number or identity of troops in the expeditionary forces. The rules also cover information of the movement of military

forces towards seaports or of the assembling of military forces at seaports, from which inferences might be drawn of any intention to embark them for service abroad.

RAILWAY EMPLOYEES SUBJECT TO DRAFT

The Railroads' War Board recently issued a circular to the railroads quoting a letter received from the Provost Marshal General, advising that there can be no exemption from the draft by classes, but that each individual case must be

UNITED STATES
GOVERNMENT

TO BE GIVEN CONTINUOUS MOVEMENT AND NOT TO BE DELAYED

a. Initial Car Number

b. Point of Shipment Date

c. Contents

d. Consignor

e. Consignee

f. Destination

g. Route

.....
(Give route and junction points through to destination)

INSTRUCTIONS

TO CONSIGNOR:

1. Fill out blank spaces a to g inclusive if practicable. Otherwise to be filled out by railway Employee.

2. Deliver to railway agent, or representative, when bill-of-lading is signed.

TO RAILWAY EMPLOYEES:

3. The billing on which car moves, whether regular bill or card bill, must be placed in this envelope at originating point.

4. Envelope containing billing must accompany car to destination in custody of proper employee.

5. If car is set out for repairs short of destination, conductor or yard-master must notify superintendent, giving contents, destination and consignee. If delayed twenty-four hours or more, superintendent must notify consignee by wire through proper channel.

6. If this freight be transferred en route, notation of such transfer must be made on card or regular bill enclosed. The car number and initial into which transfer is made must also be noted in spaces below:

Transferred To
Initial Number

AtDate

Signed
(Initial)

7. Railway agent at destination after removing contents will promptly deliver this envelope to the consignee.

Waybill Envelope for Government Shipments

taken up and determined upon its own merits by the federal exemption boards in accordance with the regulations promulgated by the President. The letter states that it is the policy of the administration to so execute the selective service act as not to unnecessarily cripple any industry.

To the railroads the war board suggested that a careful census be taken of the men on the various roads subject to draft, classifying them as to unmarried and married and with reference to dependents, also showing those who may be relieved from this service without embarrassment since they can be replaced either by men experienced in railway

operations or by women. As to those who it is felt should be relieved from military duty, it is suggested that lists should be prepared setting out the facts in detail for each district, with affidavits detailing the facts to be subscribed to by the immediate superior officers and certified to by the superintendent or head of the department, these lists and

the war with Germany. The Nation is counting on you."

Number 3 shows Uncle Sam holding out a copy of bulletin No. 12 issued by the Railroads' War Board outlining methods of increasing the efficiency of the railroads. Below the picture is the following:

"Have you read bulletin No. 12? The War Board direct-



Cantonment at Fort Riley, Kan., Showing a Train of Lumber Cars Which Have Just Been Unloaded

affidavits to be promptly furnished the exemption boards in the various districts.

RAILROAD WAR POSTERS

The Railroads' War Board has now had prepared three of a series of posters to be posted in various places where railway employees congregate, emphasizing the importance of railroad efficiency in war. The first of this series was described in these columns some time ago. The second is headed "Locomotives and Shrapnel" and shows a picture of

ing the operation of all the railroads in the United States during the period of the war, has issued a bulletin—No. 12—telling you how to help your country. Read it! Live up to it! The Nation is counting on you."

* * *

B. A. Enloe, chairman of the Tennessee Railroad Commission, has written a letter to Fairfax Harrison, chairman of the Railroads' War Board, in reply to Mr. Harrison's letter asking for the co-operation of state commissions in the work of conserving transportation. Mr. Enloe says his



Unloading Lumber at the Wrightstown, N. J., Cantonment

Uncle Sam pointing with one hand to a locomotive and with the other to a pile of ammunition. Below the picture is the following:

"Our Nation needs locomotives as much as shrapnel. Ordinarily, 15 per cent of all the locomotives on our railroads are in the repair shop. By reducing that percentage to 10 we can add 3,325 locomotives to the number available for use on our railroads. If we can keep more locomotives in good running order, we will help our country in

commission is making no unreasonable exactions of the railroads and is co-operating in various ways but he protests against the "unjust and unfair discrimination" practiced against the railroads of his state by allowing their equipment to be taken north of the Ohio river and held there instead of being returned. He cited figures to show that on July 1 the southeastern lines controlled 29 per cent less box cars than they owned and urged an increase in the per diem rate. After citing the increased demurrage rate, up

Bridge Work on the Chalco-Yutan Cut-Off

The Structure Over the Platte River on the New Burlington Line Involved Ingenious Foundation Methods

THE Chicago, Burlington & Quincy recently completed a cut-off 12.37 miles long which shortens the distance over its line between Omaha and Sioux City, Iowa, by 15.74 miles and provides a low grade line from Omaha into the Platte river valley. The new line is known as the Chalco-Yutan cut-off as it begins at a point 2.89 miles west of Chal-

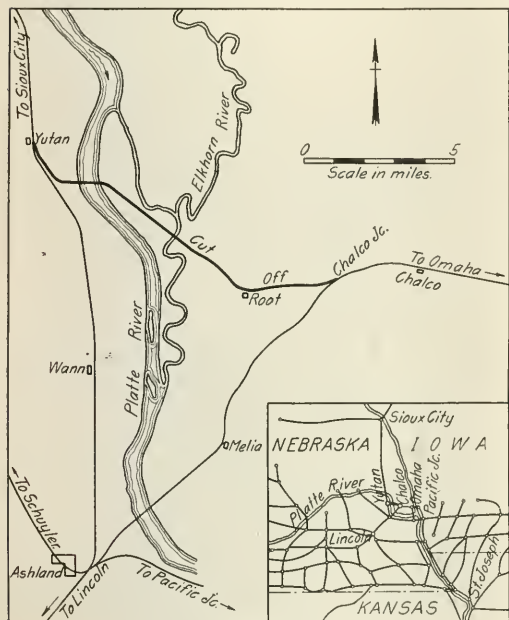
The line involved considerable heavy work for this part of the country. One cut, consisting of about 250,000 cu. yd. of earth, caused trouble because several springs were encountered about 25 ft. above grade. The material was all handled by steam shovel and trains. Excavated material was hauled from three to five miles for use in embankments in the Platte river bottoms. The grade for four miles across these bottoms was built by a drag line outfit and was rather wet work.

The tracks were carried over the Elkhorn river on a temporary pile and frame trestle which was later replaced by a permanent structure consisting of two 50-ft. spans, one 100-ft. span and one 105-ft. span, all deck plate girders. The grade of this bridge is about 40 ft. above the river, necessitating high piers. The foundations for these piers consist of 18-ft. by 40-ft. concrete box cofferdams 15 ft. deep, sunk by excavating the material from within which was handled by a track derrick and an orange peel bucket operated from the track on the temporary bridge. Wooden foundation piling were then driven within these boxes and capped with concrete on which the neat work of the piers was constructed.

The east approach fill to the Platte river bridge is composed of sand excavated from the river by a drag line. Five hundred feet of this approach was built in the river, the drag line working from the new fill and moving forward as it was completed.

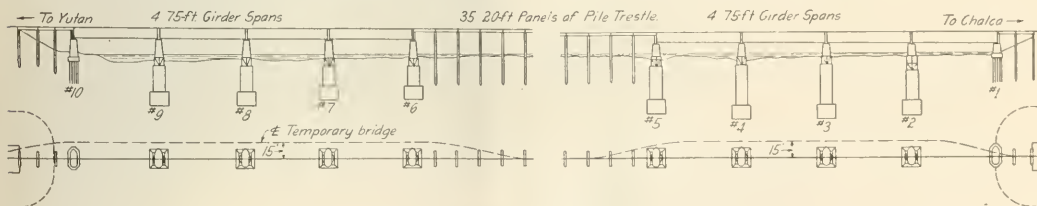
THE NEW PLATTE RIVER BRIDGE

The Platte river bridge has a total length of 1,383 ft. and consists of four 75-ft. girder spans on each side of the river with 700 ft. of pile trestle between and short bank spans at the outer ends. The entire bridge is on a tangent on a 0.5 per cent grade. The two girder structures at each end of the bridge cross the main and secondary channels characteristic of the Platte river, necessitating the provision of ample waterway openings close to each shore line. The middle of the river is usually very shallow and in the dry season is a dry sand-bar which seldom or never scours out to any great depth so that deep piers are not necessary there for the safety of the bridge. By building the approach fills out from both sides the river has been narrowed from 2,000 ft. to 1,300 ft., thereby causing the channels to scour out under the bridge and providing deep water which permits the free passage of ice and drift during flood stages.



Location of the New Line

co, Neb., on the Chicago-Denver main line and ends at Yutan, Neb., on the line between Ashland and Sioux City. The most important single feature of the project is the bridge over the Platte river near Yutan, which is the second per-



Elevation of the Bridge

manent structure built by the Burlington over that stream in the last few years.

CONSTRUCTION OF THE LINE

The construction of this line was begun in 1914, but work was suspended at the beginning of the European war. It was again resumed in 1916 and completed early in 1917.

The substructure consists of eight deep piers and two shore piers. The latter are founded on thirty 28- and 24-ft. concrete piles driven to a depth of 6 to 8 ft. below low water. The river piers were originally planned to be sunk by the open dredging method but the pneumatic process was later adopted.

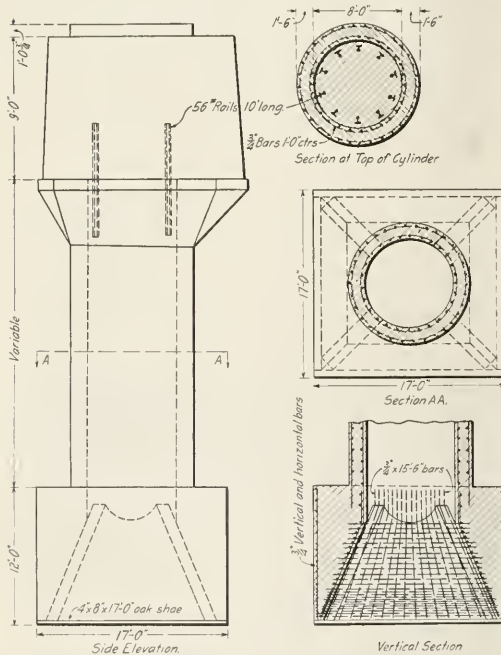
A temporary pile trestle was constructed across the river

from which all material was handled for constructing and sinking the caissons. The trestle was built to grade. Opposite the pier sites it was located 15 ft. up stream from the permanent bridge line, but between the two girder structures it was swung over on the center line and joined the permanent trestle which was driven in time to serve for construction purposes.

THE CAISSONS

The caissons were of concrete construction, 17 ft. square at the cutting edge. This edge consisted of 4-in. by 8-in. fir timbers fastened to the caisson by 1-in. bolts 24 in. long embedded in the concrete. The outside surface of each caisson was perpendicular for 12 ft., then offset to an 11-ft. cylinder. The inside was 15 ft. 8 in. square at the cutting edge and converted to a circle 8 ft. in diameter at a point 9 ft. above, thus forming an 8-ft. well through which dredging was carried on. The base sections were heavily reinforced on both the inner and outer surfaces. The forms for the bases were of wood and so built as to permit their removal and re-use.

Owing to the shallow waters of the Platte, it was possible to place wooden cofferdam boxes at the pier sites and fill them with sand dredged from the river, thus forming a foundation on which the forms for these caissons were



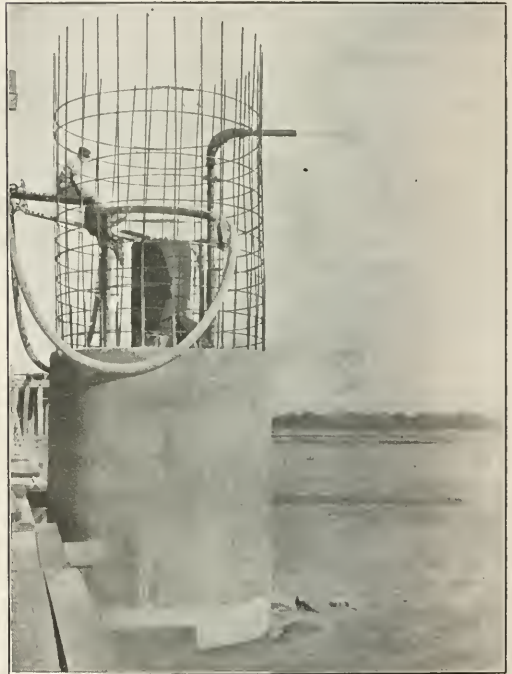
Details of a Pier and Caisson

erected and concreted. The box cofferdams were built 6 ft. high and 24 ft. square, using 4-in. by 10-in. timbers with 6-in. by 8-in. posts or studding. The sides of the boxes were made separate and were bolted together when in use. Before placing these boxes, it was necessary to build a temporary diversion dam up stream from the proposed pier sites in order to deaden the current, causing silt to be deposited below which decreased the depth of the water in some cases 10 to 3 ft.

To take advantage of low water during the summer the

bases of all eight caissons were built in place and sunk to a depth of 12 ft. to make them safer after which it was planned to go back and complete the sinking which could be done regardless of high water. Each base or bottom section of the caisson was 17 ft. high, that is, 12 ft. of the square base and 5 ft. of an 11-ft. cylinder. Additional sections of cylinder were added as the sinking progressed. Forms for the cylinders were of steel for the outside and collapsible wooden forms for the inside.

Test borings taken some time before indicated loose sand



The Caisson for Pier No. 8

to a depth of 27 ft. below the water surface, then a 2-ft. stratum of clay, under which was a hard white sand or sandstone for an additional depth of 9 ft. Under that a yellow sandstone was encountered, into which the caissons were sunk to a depth of 5 ft.

Piers 6 and 7 were sunk first. These were dredged out and sunk at the rate of 10 to 13 ft. per 10-hour day until the clay and sandstone were encountered. At this point it was impossible to get any more settlement, although the excavation was carried down to a depth of 10 ft. below the cutting edges. Owing to the flaring base of the caissons it was impossible to excavate close to the cutting edges with the dredge bucket through the 8-ft. well. Various means were employed to break up the clay and sandstone under the cutting edges but without success. Because of this condition it was decided to use the pneumatic process to complete the sinking.

PNEUMATIC WORK

Up to this time work was carried on by company forces, but the pneumatic work was let to a contractor. The necessary pressure plant was installed and the open caissons were covered and fitted with air appliances. Wooden decks were made of 8-in. by 16-in. timbers to fit the 8-ft. wells in the

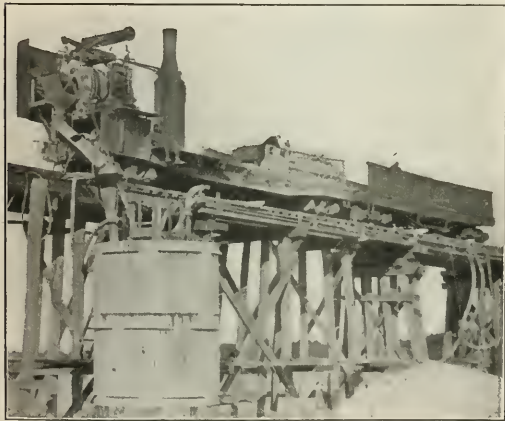
cylinders. After each deck was provided with one 3-ft. man shaft and the necessary air, water and blow pipes, it was lowered to the bottom of the 8-ft. well and supported just above the flare inside of the base. The sides of the deck were padded with oakum and covered with burlap to take up any irregularities on the surface of the concrete inside the well. This permitted sealing with concrete under water. From three to five feet of a concrete seal was placed in this manner and when set the caisson was unwatered above the



Rock Filled Cribs and Rip Rap to Protect Embankment

deck and concreted to above the water surface. Sand hogs were then able to continue the excavation and the sinking progressed to a landing without further trouble. In some cases it was necessary to go to a depth of 58 ft. to obtain a suitable foundation.

All concrete work was handled by a 10-cu. ft. Ransome mixer mounted on a flat car and operated by steam from a small upright boiler placed on the car. Bank run gravel was conveyed to the mixer hopper from cars adjacent by



The Concrete Mixer Plant

means of a narrow-gage dump car on rails laid on the deck of gravel and mixer cars. The mixed concrete was handled to the forms by spouting.

THE SUPERSTRUCTURE

The eight spans of 75-ft. girders were placed in two days by a 25-ton track derrick and a 25-ton locomotive crane. The girders were loaded at the storage yard and hauled $\frac{1}{4}$ mile on two flat cars, two girders or one span at a time.

Each girder was placed separately, and they were bolted together after landing them on the piers. The bridge floors consist of 8-in. by 10-in. by 10-ft. creosoted ties with 4-in. spaces between them, covered with a fire-resisting paint.

The timber trestle between the girder bridges is 700 ft. long. Each bent consists of six 44-ft. creosoted piles, sway-braced and box-capped with two 8-in. by 16-in. by 14-ft. timbers. The bents are spaced 20 ft. center to center and the deck consists of 9-in. by 24-in. stringers with 8-in. by 8-in. by 10-ft. ties spaced 14 in. center to center with 6-in. by 8-in. outside guard rails. Each bent is protected on the upstream end with a steel nose rounded to fit the piling, and, in addition the sides of each bent are protected from ice by 4-in. by 10-in. timbers placed horizontally. The deck of this trestle is covered with galvanized iron as a protection from fire. Three hand car refuge platforms are provided at a uniform spacing on the upstream side of the bridge.

The Union Bridge & Construction Company, of Kansas City, Mo., was the contractor for the pneumatic piers. All



Partly Completed Piers

the other work was handled by railroad forces. The construction was under the supervision of G. A. Haggander, bridge engineer of the Chicago, Burlington & Quincy, Chicago, Ill., F. T. Darrow, engineer maintenance of way, Lincoln, Neb., and J. H. Merriam, resident engineer, in direct charge.

JAPANESE OUTPUT AND EXPORT OF COPPER ORE.—The output of copper ore in Japan in 1916 amounted to 111,562 tons, as compared with 83,017 tons in 1915, and 78,700 tons in 1914, while exports amounted to 57,402 tons in 1916, as against 56,528 tons in 1915, and 43,305 tons in 1914. Russia now buys most of Japan's copper ore, her purchases amounting to 60 per cent of the total exports. The United Kingdom takes 20 per cent, while France, the United States and India share the balance, but their dealings are not large. The consumption of copper ore in Japan has increased considerably during the last three years, the consumption of 1916 amounting to 59,690 tons, as compared with 27,723 tons in 1915 and 32,045 tons in 1914.

EMPLOYEES' CO-OPERATIVE FARM ON THE ILLINOIS CENTRAL

Illinois Central employees, on Saturday, July 28, participated in a celebration in recognition of the successful organization and operation of a co-operative farm project on company property between the tracks of the Illinois Central and the Chicago & Eastern Illinois at One Hundred and Thirtieth street, Chicago. This tract, known as the Wildwood Farm, represents a new departure in railway agricultural activities. In response to President Wilson's proclamation urging the most extensive production of food stuffs in the interests of the success of the United States and its allies in the war, W. L. Park, vice-president of the Illinois Central, offered the company's right of way and vacant property to employees for garden purposes. Complying with this offer, employees of the railroad in Chicago under the leadership of Wm. J. Pinkerton, an engine foreman, induced Mr. Park to prevail upon C. H. Markham, president of the company, to set aside the unused right of way near One Hundred and Thirtieth street for the purpose of testing a plan of co-operative farming. This plan was advantageous, because a scheme of allotment to individual employees was not feasible on account of the distance of available land from the homes of the men. On April 15 Mr. Pinkerton organized the Volunteer Agricultural Corps of Illinois Central Employees to finance and direct the cultivation of the right-of-way tract offered by the management. After interested employees had cleared the land of old ties, fences and accumulated litter, two farmers were hired to carry on the work of plowing and seeding the land.

The engineering department sent men to the ground to run levels so that the furrows could be plowed to the lowest point for drainage. A farm house was constructed from two refrigerator car bodies and a stable from a box-car. The compensation of the farmers was fixed at \$8.00 a day, which covers not only their own labor but the services of their teams. Tools, seed and water supply were secured and on May 4 the first seeding was done, when four acres were put

corps who have found it possible to put in some of their spare time on the farm.

PLAN OF ORGANIZATION

Under the terms of the temporary organization effected on April 15, employees and officers of the Illinois Central who took from 2 to 18 shares in the corps were made members of the organization. Each share carries with it the obligation to pay into the treasury of the corps the sum of \$1.00 per month for a period of six months beginning with April 1, 1917. The products of the farm are sold at prevailing commission market prices with no special privilege to members except the first choice of purchase. The proceeds of the sales are paid into the treasury of the corps, and will be utilized to pay the running expenses and provide for a working capital to continue operations in the ensuing year. In case there is a surplus it will be divided among the members in accordance with the number of shares held by each. The officers of the corps consist of a colonel, lieutenant colonel, major, eight trustees, and a general secretary and treasurer, who hereafter will be elected by a majority vote of the outstanding shares of the corps at the annual meeting of stockholders, the next session of which will take place on February 1, 1918. Under the temporary organization Joseph H.

Nash, superintendent of motive power at Chicago, was made colonel and M. P. Blauvelt, until recently controller, general secretary and treasurer.

The official depository of the corps is the Woodlawn Trust & Savings Bank, Chicago. All funds paid into the treasury must be deposited by the general secretary and



Captain William J. Pinkerton



A Field of Cabbages



General View of Farm Towards C. & E. I. Tracks

into yellow dry onions. Since that time 60 out of the 90 acres available have been planted with various vegetables, including beets, carrots, parsnips, cabbage, cauliflower, spinach, radishes, turnips, lettuce, beans, potatoes, tomatoes and corn.

In doing the work the farmers have been assisted by two negro laborers and by those members of the volunteer

treasurer within 24 hours of collection. All settlements of obligations of the corps of whatever amount or character must be made by draft or check upon the official depository, all of which must be signed by the colonel and general secretary-treasurer jointly. Up to date 200 officers and employees of the company of all ranks have taken shares in the corps. For several weeks past the farm has been making regular shipments of vegetables to members and others. According to the present scheme of distribution, the vegetables are shipped by suburban trains from Wildwood to various points on the Illinois Central where those sending in their orders are employed. The success of Wildwood Farm is largely due to the efforts of Illinois Central employees, rather than officers of the road. Foremost among these has been Mr. Pinkerton.



First and Last Stages of a Collision

"The Rule of Reason," a New Motion Picture

Striking Lessons in Safety First (Not Omitting a Forceful Anti-Whiskey Lecture) for New York Central Men

MARCUS A. DOW, general safety agent of the New York Central Lines, has brought out a third "safety film" for use in connection with the work of the safety committees of the roads in the New York Central system, and it was shown at the Rialto theatre in New York City on Tuesday of this week. This picture, entitled "The Rule of Reason," is a finished production, surpassing even the two former excellent works of Mr. Dow in this field, "Steve Hill's Awakening" and "The House that Jack Built." It has no

when working on or about freight trains, which are obvious to any man of sense, when he stops to think; with shop safety and some other things thrown in for good measure. The picture lesson is taken up with these things; but the spectator is taken up also with a love story, beautiful actresses, horseback rides, moonlight walks and the usual "movie" details, which make 50 or 60 minutes pass very quickly. Every detail has been managed with perfect skill, and Mr. Dow evidently has secured the best professional ability in all of his assistants.

The exhibition starts off with a verse—"Little Drops of Water, Tiny Grains of Sand," etc., and continues:

"Thus it is that little things make the joys and sorrows of life. Rules cannot govern every little action, every little deed. But common sense, let us call it the 'rule of reason,' will, if cultivated, bridge many a treacherous stream."

The story tells of the adventures of Bob Tracy, a young man employed as yard brakeman, who because of his unsafe habits is a thorn in the side of his brother-in-law, Jack Foster, the superintendent. Hoping to inculcate safety ideas in the young brakeman's mind, Foster puts him on the safety committee. Bob's sister, who is Superintendent Foster's wife, is horrified to discover accidentally that Bob is in the habit of taking, on the sly, a drink of intoxicating liquor from a flask he keeps in a closet at home, each day before he starts for work. He does not get drunk and even his fellow employees are not aware of his habit, which he has succeeded in concealing from others. Mrs. Foster concludes that Bob's carelessness—of which illustrations are given—is largely caused by the fact that his mental acuteness is impaired because of this secret violation of Rule G; and in a dramatic scene she endeavors to make him see that men engaged in hazardous employment should maintain habits that will insure a perfectly normal physical and mental condition at all times, which, to her mind, is a "rule of reason." Mrs. Foster's appeal to Bob, together with his first experience at the safety committee meeting, make a profound impression upon him. The influence of a little four-year-old girl, Baby Foster, his niece, innocently wielded in a sweet childish way, adds to Bob's concern and his con-



Result of a Collision*

connection with the abstruse reasonings which are to be found in Chief Justice White's celebrated decision, in which a certain "rule of reason" was laid down as the law of the land, but is wholly taken up, so far as the lesson goes, with the simple reasonings concerning the care of one's own bodily safety,

*The first and third stages of this made-to-order collision are shown at the head of the article. The first picture was taken at the moment of impact, and the second one a few seconds afterward; the explosion occurred a little later, in a car bearing an "Explosives" card which had not been heeded.

science finally revolts against his shortcomings. Neglecting to close a switch in the yard after he has let a train in on a yard track, and falling asleep because of his improper indulgence, he dreams that a frightful yard collision occurs through his neglect. His dream is pictured on the screen with vivid realism and the wreck scene is equal to and even exceeds in realism the wreck scene pictured in "The House That Jack Built." Told of the wreck by her young son, who saw it from a nearby embankment and who rides post haste on a bicycle to inform her, Mrs. Foster mounts a horse and gallops to the yard in time to save Bob from the fury of his fellow employees, who are bent on vengeance.

Awakening from his dream with a start and stricken with fear and horror, Bob stumbles forward and throws the switch to proper position, and then to his great relief finds the train still safe and that no collision in reality happened. He has had his lesson, however, and taking a flask from his pocket smashes it against a rail and resolves that both carefulness and abstinence shall be his habits for all time. The love story is intertwined with the other scenes, and in the end Bob's fiancée, Betty, who is a stenographer in the superintendent's office, shows her approval of Bob's reformation.

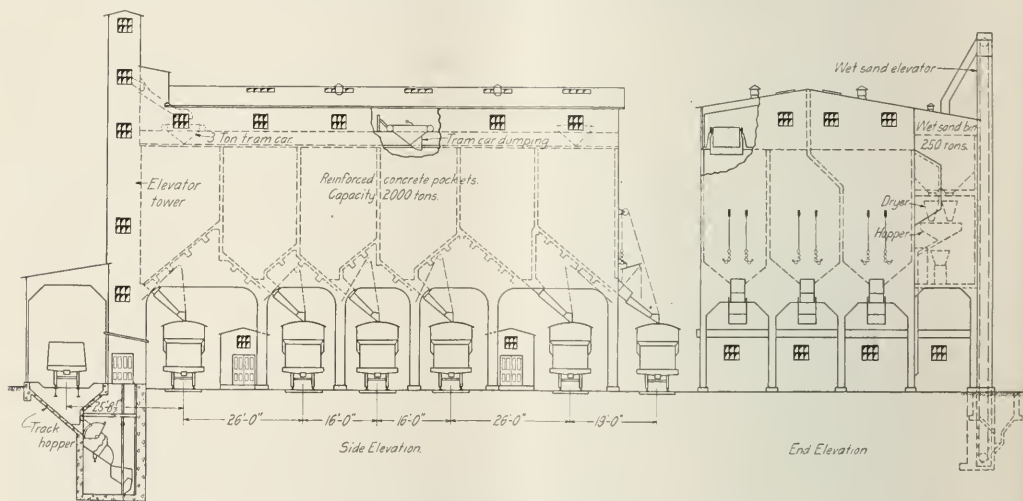
One prominent scene shows the safety committee in session in Superintendent Foster's office and with this a number of accidents due to unsafe practices are cleverly shown on the screen. The chairman of the committee is reading from the accident record book the records of accidents on his division and as the pages are turned each page dissolves into

who was brakeman "Jack Foster" in "The House That Jack Built," is now Superintendent Foster in the new picture, a part which he plays with good taste and ability. Miss Elsie Balfour makes a pretty and winsome stenographer. Mention also should be made of the three children, all of whom are good, but the part played by little Miriam Battista, a clever child actress, who was with Maude Adams in "A Kiss for Cinderella" last season, is one which will have an especial appeal to all. The photography is exceptionally good, the work being done by Irving B. Ruby, camera man for the World Film Corporation.

The "Rule of Reason" will be shown to Central employees in the company's two motion picture cars, which are in reality up-to-date "movie" theatres on wheels. It will also be made the feature of many large safety rallies to be held in important cities during the coming months. The film will also be used, no doubt, by other railroads and industries, as was the case with the other films referred to.

THE LARGEST COALING STATION

Work has recently been commenced on a coaling station for the Philadelphia & Reading at Philadelphia, which will be the largest railway coal handling plant in this country. The capacity will be 2,000 tons; two-thirds of the storage space is reserved for anthracite, and one-third for bituminous coal. The storage will be divided into 18 bins. The plant will be of reinforced concrete and steel construction through-



General Outlines of The Structure

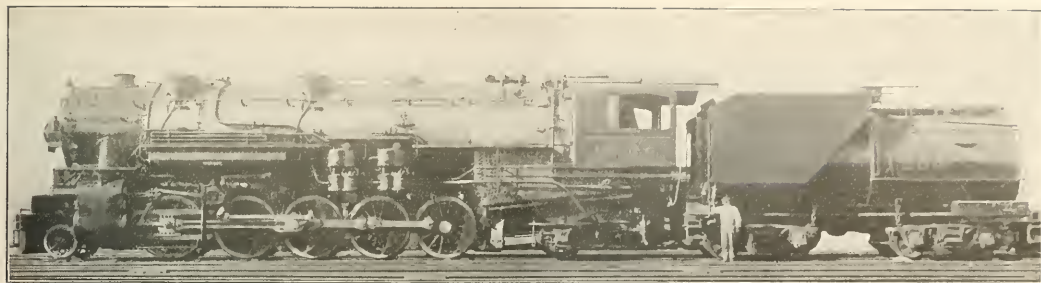
an actual motion picture of the accident described on the page.

The story is a strong one and the production a worthy successor of "The House That Jack Built" now well-known all over the country. As in the former picture, Charles E. Davenport of New York, staged the play with great ability and thoroughness as to detail. A strong cast of professional moving picture stars were assigned to the various roles. Miss Iva Shepard, who had the leading part in "The House That Jack Built," does excellent dramatic work as Mrs. Foster in this new picture. Robert Clugston, a leading man who has appeared in many Fox productions and others, does excellent work as the careless yard brakeman, a difficult part, to which only a finished actor could do justice. Al Thomas,

designed to serve locomotives on six tracks. Two large track hoppers will be provided to receive the coal, each of which will be equipped with elevating machinery capable of hoisting 125 tons of coal an hour.

In addition to the coal handling facilities, the plant will be equipped with sand drying and storage equipment, including a wet sand dump hopper, an elevator, a wet sand storage bin of 250-tons capacity, six Beamer steam sand dryers, and a 125-ton dry sand storage pocket, from which the dry sand can be supplied to locomotives standing on the six tracks. The plant will also be provided with wash houses, hostlers' room, heating appliances and electric lights.

The plant is being constructed by Roberts & Schaefer Company, Chicago, Ill., the contract price being \$265,000.



Denver & Rio Grande 2-10-2 Type Locomotive—The Heaviest of Its Type Yet Built

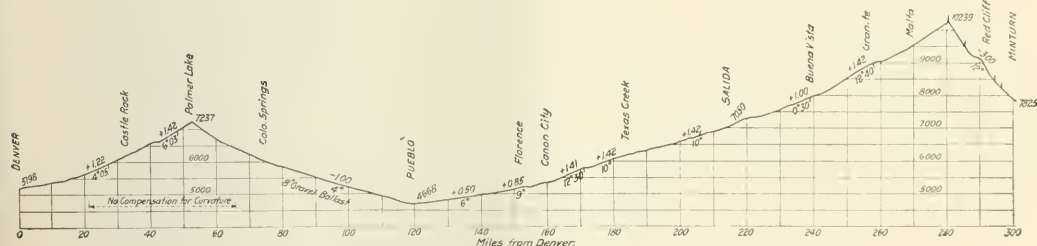
The Heaviest Santa Fe Type Locomotives

Used in Both Road and Pusher Service on the Heavy Grader of the Denver & Rio Grande Railroad

TEN of the heaviest locomotives of the 2-10-2 type ever built were delivered to the Denver & Rio Grande by the American Locomotive Company about six months ago. These locomotives weigh 428,500 lb. and have a tractive effort of 81,200 lb. Of the ten, five are being used between Denver and Salida, Col., on through freight trains and five are being used between Minturn and Tennessee Pass, Col., which is at the top of the grade between Minturn and Malta, as helpers. The condensed profile of the divisions on which these locomotives are operating is shown and, as will be seen, there are many heavy grades and sharp curves. On the line between Denver and Salida the maximum grade is 1.42 per cent with 6-deg. curves, not compensated, and at one point there is a 12-deg. 30-min. curve.

an increase of 13.4 per cent. While the traffic increased 1.2 per cent as compared with January, 1917, the train-miles decreased 7 per cent and the locomotive-miles decreased 11 per cent. A tabular comparison of these locomotives with the Consolidation and Mallet types, which are used in the same district, is given below:

Type	2-10-2	2-8-0	2-8-2
Service	Through freight and helper	Through freight	Helper
Tractive effort	81,200 lb.	44,000 lb.	95,000 lb.
Weight in working order	428,500 lb.	230,400 lb.	458,000 lb.
Weight on drivers	337,500 lb.	194,100 lb.	394,000 lb.
Weight of engine and tender	624,900 lb.	378,100 lb.	629,200 lb.
Wheel base, driving	22 ft. 6 in.	15 ft. 8 in.	40 ft. 8½ in.



Profile of the Line on Which the 2-10-2 Type Locomotives Operate

Between Minturn and Tennessee Pass the maximum grade is 3 per cent and the westbound track has a maximum curvature of 16 deg. Since the rigid wheel base of these locomotives is only 16 ft. 6 in., no difficulty is experienced in operating on these sharp curves. The locomotives were not designed for helper service, the Mallet type being regularly used for that purpose. Owing to the demands of traffic it was found necessary to use a larger number of helper locomotives and the 2-10-2 type was chosen as best fitted for the work.

In the district between Denver and Salida the traffic amounts to approximately 80,000,000 ton-miles per month. About 25 locomotives are required to handle this tonnage. In January, 1917, when the Consolidation type was being used, the gross tons of freight per locomotive-mile in this district averaged 942. In March, with five of the 2-10-2 type locomotives in service, the average tonnage was 1,068,

Wheel base, rigid	16 ft. 6 in.	15 ft. 8 in.	15 ft. 0 in.
Wheel base, engine and tender	76 ft. 9½ in.	59 ft. 5¼ in.	91 ft. 3¼ in.
Cylinders	31 in. by 32 in.	23 in. by 28 in.	26 in. and 40 in. by 32 in.
Driving wheel diameter	63 in.	57 in.	57 in.
Boiler, working pressure	195 lb. per sq. in.	200 lb. per sq. in.	200 lb. per sq. in.
Heating surface, total	5,369 sq. ft.	3,036 sq. ft.	5,125 sq. ft.
Superheater heating surface	1,329 sq. ft.	.....	998 sq. ft.
Equivalent heating surface	7,362 sq. ft.	3,036 sq. ft.	6,622 sq. ft.
Grate area	88 sq. ft.	49 sq. ft.	80 sq. ft.

In order to make it possible for these locomotives to take 10-deg. curves without trouble, the tires on the first, the main, and the last pairs of drivers were set 53⅜ in. apart. On the second and fourth pairs, the tires are set 53⅜ in. apart. Lateral flexibility in the driving wheel base is secured by the use of the Woodward floating front driving

axle. The front truck has 6½-in. swing either side of the center and the trailing truck 4¾ in.

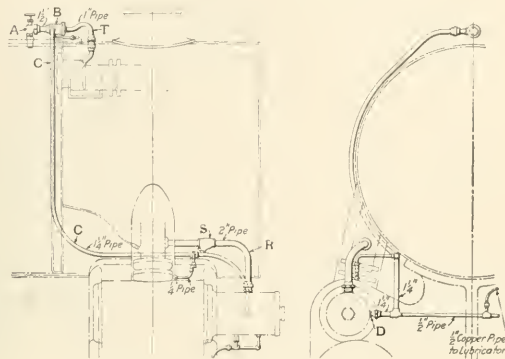
The boiler has been carefully designed to secure high capacity. It is of the conical type, being 96 in. in diameter at the first ring. An auxiliary dome is provided to carry the safety valves and the whistle. The firebox is fitted with a combustion chamber 50 in. long and has a Security brick arch. The locomotives have Schmidt superheaters and are fired by Street stokers. There are two blow-off cocks on each side of the firebox and one is placed in the front course of the boiler.

The frames are of cast steel, with a top rail 6 in. by 7 in. increasing to 6 in. by 9 in. over the driving boxes. The front frame rails are 6 in. by 13 in. The Commonwealth locomotive cradle is used. The cylinders have bushings of Hunt-Spiller gun iron, and the pistons are fitted with bull rings of the same material. The piston valves are 16 in. in diameter.

A new device which has been applied to these locomotives is the Vincent drifting valve. It consists of a valve attached on the end of the main valve stem and working in a chamber extending out from the valve head. This chamber is connected to the boiler through an automatic shut-off valve and to the steam pipe through a check valve. The operation of the drifting valve is as follows: When the main throttle is opened, superheated steam from the header passes through the pipe shown in the drawing at *T* to the differential valve *B* and closes it against the boiler pressure. When the main throttle is closed, saturated steam from the boiler is admitted through the valve *A* to the differential valve *B*, and thence through a 1¼-in. pipe *C* to the drifting valve connection *D* or *E*. It then passes into chamber *F*, through ports *G* into chamber *H*, and through ports *K* into chamber *L* or *M* according to the position of the valve *J*. When the position of the valve *J* is reversed, steam exhausts through

are of Nikrome steel. The valve motion is of the Baker type controlled by the American Locomotive Company's power reversing gear.

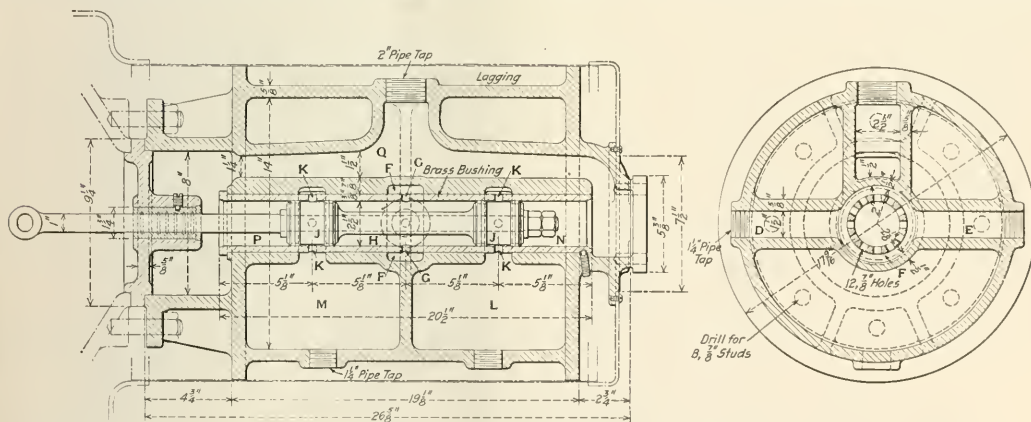
The brake equipment is the Westinghouse E T, with two 8½-in. air compressors. Two 14-in. by 12-in. brake cylinders attached to the frames behind the cylinders are provided



Piping for the Vincent Drifting Valve

for the first three pairs of drivers. The fulcrums for these cylinders are attached to the frames beneath the cylinder saddles. The two rear pairs of drivers are braked by two 12-in. by 10-in. cylinders. The tender trucks are provided with clasp brakes.

Among the specialties applied to these locomotives are the Chambers throttle, Nathan non-lifting injectors, Woodward engine trucks, Cole trailing truck, Chicago flange lubrica-



The Vincent Drifting Valve in Use on the D. & R. G. Locomotives

the ports *K* and *N*, or *P*, into the chamber *Q*, and thence through the pipe *R* into the main steam pipe and steam chest. A check valve *S* prevents steam from the main steam pipe entering the pipe *R*. Drain pipes are provided at the bottom of the chambers *L* and *M*.

The tires on all wheels of these locomotives are flanged. The axles are of carbon vanadium steel, the main axle having bearings 13 in. in diameter and 22 in. long, while the front bearings are 11 in. by 19 in. and all others 11 in. by 13 in. The main crank pins have 9½-in. by 10-in. bearings for the main rods and 10½-in. by 5½-in. bearings for the side rods. The crank pins, side rods and piston rods

tor and Economy radial buffer. The tenders are equipped with Miner friction draft gear, Barber side bearings and lateral rollers, the Lindstrom syphon tank valves and Davis cast steel wheels.

The principal dimensions and ratios of these locomotives are as follows:

General Data	
Gage	4 ft. 8½ in.
Service	Freight
Fuel	Bit. coal
Traction effort	81,200 lb.
Weight in working order	428,500 lb.
Weight on drivers	337,500 lb.
Weight on leading truck	31,000 lb.
Weight on trailing truck	60,000 lb.

General Data (continued)

Weight of engine and tender in working order.....	126,624.900 lb.
Wheel base, driving wheels.....	22 ft. 6 in.
Wheel base, total.....	74 ft. 5 in.
Wheel base, engine and tender.....	76 ft. 9 1/2 in.

Ratios

Weight on drivers ÷ tractive effort.....	4.16
Total weight ÷ tractive effort.....	5.28
Tractive effort × diam. drivers ÷ equivalent heating surface*.....	694.9
Equivalent heating surface ÷ grate area.....	83.66
Firebox heating surface ÷ equivalent heating surface* per cent.....	5.00
Weight on drivers ÷ equivalent heating surface*.....	45.84
Total weight ÷ equivalent heating surface.....	58.20
Volume both cylinders.....	27.95 cu. ft.
Equivalent heating surface* ÷ vol. cylinders.....	263.4
Grate area ÷ vol. cylinders.....	3.15

Cylinders

Kind.....	Simple
Diameter and stroke.....	31 in. by 32 in.

Valves

Kind.....	Piston
Diameter.....	16 in.
Greatest travel.....	6 3/4 in.
Outside lap.....	1 in.
Inside clearance.....	0 in.
Lead in full gear.....	3/16 in.

Wheels

Driving, diameter over tires.....	63 in.
Driving, thickness of tires.....	3 1/2 in.
Driving, journals, main, diameter and length.....	13 in. by 22 in.
Driving, journals, front, diameter and length.....	11 in. by 19 in.
Driving, journals, others, diameter and length.....	11 in. by 13 in.
Driving, truck wheels, diameter.....	33 in.
Engine truck, journals.....	7 in. by 12 in.
Trailing truck wheels, diameter.....	42 in.
Trailing truck, journals.....	9 in. by 16 in.

Boiler

Style.....	Conical
Working pressure.....	195 lb. per sq. in.
Outside diameter, first.....	132 in. by 96 1/2 in.
Firebox, length and width.....	132 in. by 96 1/2 in.
Firebox, water space.....	front, 7 in.; sides and back, 6 in.
Tubes, number and outside diameter.....	252-25 1/2 in.
Flues, number and outside diameter.....	252-25 1/2 in.
Tubes and flues, length.....	23 ft. 0 in.
Heating surface, tubes and flues.....	5,001 sq. ft.
Heating surface, firebox.....	368 sq. ft.
Heating surface, total.....	5,369 sq. ft.
Superheater heating surface.....	1,329 sq. ft.
Equivalent heating surface*.....	7,362 sq. ft.
Grate area.....	88 sq. ft.

Tender

Tank.....	Vanderbilt
Frame.....	Cast Steel
Weight.....	196,400 lb.
Wheels, diameter.....	33 in.
Journals, diameter and length.....	6 in. by 11 in.
Water capacity.....	10,000 gal.
Coal capacity.....	21 tons

*Equivalent heating surface = total evaporative heating surface + 1.5 times the superheating surface.

†Includes arch tube heating surface.

‡Includes combustion chamber heating surface.

PNEUMATIC TUBES IN FREIGHT YARDS

The great length of the modern classification yard introduces a serious problem for the operating force through the difficulty encountered in securing adequate communication between the several parts of these large terminals. Telephones supply the necessary facilities for oral communication but the delivery of way bills and other papers from incoming trains to the main yard office, usually located at

opportunities for serious loss of time, particularly if one or more bills are found missing when a train is ready to leave. Delays from this cause can easily amount to 30 minutes or more in each case.

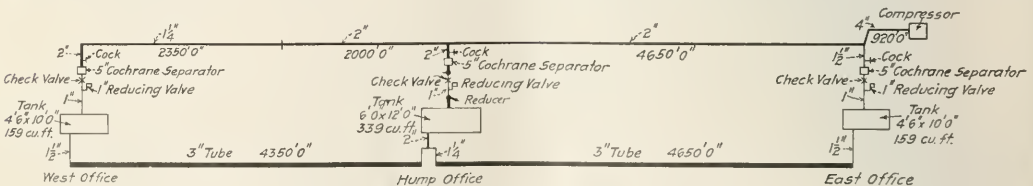
The employment of messengers for this purpose and the delays incident to messenger service have been done away with at the Gibson yard of the Indiana Harbor Belt and the Clearing yard of the Belt Railway of Chicago, by the use of pneumatic tubes connecting the general offices, situated at the hump, with the offices at each end of the yard. At the Gibson yard the installation consists of lines of 3-in. steel tubing running 4,350 ft. west and 4,650 ft. east of the hump, laid 3 ft. to 4 ft. underground. These tubes are open at both ends. In sending, a carrier is inserted in the terminal, the flapper is closed, and air is admitted behind the carrier by pressing a button, which actuates an automatic control device by means of which the air is delivered from a low pressure storage tank for a predetermined period sufficient to insure the arrival of the carrier at the other end of the tube. This air is supplied to the storage tank from the regular railroad service, having a pressure of 90 lb. to 110 lb. per sq. in. at the compressor. There are three cylindrical tanks, one at each sending point, that is, at the hump office and at the east and west yard offices. The arrangement of the supply pipes and valves is shown in the drawing.

At Clearing the tubes are 4 in. diameter and besides the two main lines, short leads connect with the office of the hump yard master and the switching tower at the hump. As these tubes will deliver a package a distance of about a mile in two minutes there is an obvious saving of time over any form of messenger service. At the Clearing yard this saving is estimated at 10 engine hours a day. That is to say, there is a saving of that amount in the time of the engine and train crews—say five men; and there is a potential saving of the per-diem cost of the cars in the trains, the movement of which is expedited.

At the Gibson plant the maintenance expenses average \$5.97 for three months' time, a figure which is said to be higher than normal. The carriers are handled by the regular clerk so that the expense to be charged for attendance is small. At Gibson the total number of carriers transmitted in a period of 24 hours recently was 220.

The tubes described were installed by the Lamson Company, Boston, Mass. The manufacturer is now recommending the use of motor-driven cycloidal blowers at each terminal, so arranged that they run only when a carrier is in the line. This system is said to operate with a much smaller power consumption than in the case where the air is taken from the regular yard air service.

WESTERN AUSTRALIA'S RAILWAYS FEEL LACK OF SHIPS.—During the year ended June 30, 1916, there was a falling



Pneumatic Tubes at Gibson (Indiana) Freight Yard

the hump, and from the main office to the conductors of departing trains, has been a source of great inconvenience and no small delay. As ordinarily administered conductors must either deliver or call for these bills at the hump office or they are carried by messengers, either method offering op-

portunities for serious loss of time, particularly if one or more bills are found missing when a train is ready to leave. Delays from this cause can easily amount to 30 minutes or more in each case.

Proposed Federal Taxation of Railroads

Railway Executives' Advisory Committee Points Out Objections to Excess Profits and Surplus Taxes

THE Railway Executives' Advisory Committee, of which Frank Trumbull is chairman, and Alfred P. Thom general counsel, last week filed with the Senate finance committee a brief outlining the attitude of the railroads towards the proposed war taxes provided in the bill recently reported to the Senate, which represents many changes from the form in which the bill was passed by the House. The bill has since been referred back to the committee for further consideration.

Revision of the war revenue bill to increase its total from \$1,670,000,000 to about \$2,000,000,000 was undertaken by the Finance Committee on July 30, with the possibility of an increase in the income tax on corporations from 4 to 6 per cent under consideration. Modification or elimination of the 15 per cent surplus tax was also discussed.

No objection is made to the four per cent tax on net income, except as to the method of arriving at "net income." As to the graduated "excess profits" tax, it is contended that railroad charges are regulated by governmental authority and therefore the income therefrom cannot be considered excess profits and that moreover railway profits are not in excess of the needs for improvements and for maintaining credit. Somewhat similar objection is made to the proposed 15 per cent tax on undistributed surplus, and it is suggested that an allowance be made of 3 per cent on the assets as surplus. The brief also calls attention to some examples of the unequal and inequitable results of the proposed methods of taxation. An abstract of the brief follows:

INCOME TAX

It must be borne in mind that "net income" as here used has a special significance and is defined in the revenue bill—it is different from "net income" as defined under the rules of the Interstate Commerce Commission. This tax is common to all corporations, is considered by responsible governmental authority to be necessary because of war requirements, and, although heavy, is not complained of; except that it seems to us that the method of arriving at "net income" is unjust. Under the law as it stands, and under the pending proposal, a part only of the interest which a debtor corporation pays can be deducted. This results in a corporation debtor paying taxes on something which is a part of its debt, namely: the part of the interest which it is not permitted to deduct in arriving at its net income. Individuals are permitted to deduct the whole of their interest payments, and no good reason seems to exist why this prejudicial difference should be insisted on against corporation debtors.

The Income Tax Law of 1916 provides (and the proposed law follows it) that, in arriving at net income, an individual may deduct all the interest he pays, but a corporation can deduct from its gross income only the interest which it has paid on an amount of indebtedness equal to the sum of its capital stock plus one-half of its indebtedness. The New York Central has \$250,000,000 of stock and \$673,000,000 of debt. It has to pay the interest on all of this indebtedness, but in computing its net income it is allowed to deduct the interest only on \$587,000,000 ($\$250,000,000 + \$337,000,000$). Its net income is thus arbitrarily increased beyond what it actually is, by an amount equal to the interest paid on this \$86,000,000 of indebtedness. The Pennsylvania, on the other hand, has approximately \$500,000,000 of stock and \$250,000,000 of indebtedness. It would be allowed to deduct the interest on an amount of debt up to \$625,000,000

($\$500,000,000 + \$125,000,000$). Consequently, in arriving at its net income, that company would deduct the interest on all its debt.

This illustration shows the inequality of the provision, and we earnestly hope that in arriving at net income a deduction of all interest will be permitted. It must be remembered that the capitalization of railroads is now largely, and doubtless soon will be entirely controlled by governmental regulation, and there is consequently no danger of inflated obligations created for the purpose of escaping taxation.

"EXCESS PROFITS" TAX

It is manifest that whether profits are "excess" or not depends upon the definition in the law of the term "excess profits." It is respectfully submitted that railroads, subject to the regulating power of the Interstate Commerce Commission can, in the nature of things, have no excess profits. This is true for two reasons:

(a) *Railroad Charges Are Regulated by Governmental Authority, and Therefore Are Not "Excess."*

The law requires that the charges of railroads be fixed by governmental authority and shall be confined to what is reasonable and just for the service. It must be assumed that the regulating body does its duty, and that no charge of a railroad includes any amount which goes to make up an excess charge. If this be true as to each charge made by a railroad, it must likewise be true of the aggregate of its charges. Bearing in mind that any proper conception of "excess profits" due to the war conditions must be based upon war prices for the things sold, the conclusion seems inevitably to follow that in reality, there is no such thing as excess profits of railroads, because, being subject to governmental regulation, they are not able to take advantage of the economic law that prices are fixed by the relation of supply to demand, and consequently they have not been able to advance their charges, as industries generally have been able to do, to take advantage of war conditions. The revenues of the railroads may be said to be derived from their increased service alone, not from increased service plus increased charges, it being remembered that the recent partial increases in some of the rates to some of the railroads did not nearly suffice to compensate them for their increased expenses. Everything derived from stationary charges and increased service is properly embraced in income and cannot be considered excess profits. The income of the railroads from their increased business is subjected to the four per cent tax, and thus does not escape its due proportion of taxation.

(b) *Profits Are Not in Excess of Needs for Improvements and for Maintaining Credit.*

It is furthermore evident that, in reality, there are no excess profits of railroads when the matter is considered from the standpoint of the vital necessity for them to keep up their facilities to the level of the public needs. The railroads have had such small earnings, as compared with the industrial investments generally, that they have not been able to go into the market, and sell their stocks and bonds to obtain money for the improvement of their facilities. This is universally recognized as a most menacing situation. Profits which are insufficient to maintain credit to the point of enabling the owners of the property to finance wisely or on a sound basis cannot be considered as "excess."

The fact is that, in respect to earnings as in respect to the character of their service and their vital relationship to the public welfare, the railroads are inevitably segregated

into a separate class. This segregation into a separate class was made by law 30 years ago when the importance of the relationship of transportation to the public welfare was recognized as so great that a statute was enacted declaring this relationship and extending governmental control over the prices railroads might charge for their services.

Congress, in dealing with the question of imposing extraordinary tax burdens, is, in considering the railroads, confronted with a subject in respect to which it is recognized in the law and by public opinion that the supreme public interest is that their efficiency in performing their public service shall be assured—certainly not be impaired.

Considered from this point of view, the question which Congress must decide is which is the best for the public, to take from the carriers the amount involved in the excess tax (and the same considerations relate to the surplus tax), or to leave this amount in the treasury of the carriers to be used in the production of increased and improved transportation facilities or as a reserve basis of credit on which the money needed to create the additional facilities may be borrowed.

It is manifest that the answer to this question depends upon whether the facilities of the railroads are already equal to the public needs, and, if not, whether from other sources the railroads can secure the money necessary to provide such additional facilities as are needed.

The evidence on this subject is significant. Without going into a full statement, it seems sufficient to point to the proof which Congress has itself recently given in passing a bill conferring upon the President the right to order priority and preference between shipments. This action was based upon the conviction that the transportation facilities are not now sufficient to move promptly without preference the commerce of the country with the added transportation required by the war needs of the government and its allies. This means that, in the opinion of Congress, the present facilities of the railroads are not sufficient for the extraordinary demands upon them.

Moreover, the action of a distinguished senator, backed as we understand by a not inconsiderable opinion in the Senate, in proposing a governmental appropriation of \$100,000,000 to buy cars to be leased to the railroads is likewise based upon the conviction that more facilities are required.

Congress is, therefore, called upon, in its tax policy, to deal with a subject of taxation, the efficiency and adequacy of which are absolutely vital to the public safety and public welfare, and to determine what is best in the public interest in respect to the use which shall be made by the carriers of their earnings—whether, on the one hand, they shall be taken in the form of taxation, or, on the other, shall be available for use in direct payment for additional facilities or as a basis of credit to get the larger sums needed to create additional facilities admittedly essential to supply the public needs. In this connection, it must be borne in mind that, just to the extent that transportation facilities are inadequate, they impose a limit upon the transaction of business generally, and, thereby impose a limit upon the country's production. Such a check on production will reduce the income available for the use of the Government in the prosecution of the war.

In determining upon a policy, it is likewise essential for Congress to consider what the financial needs of the railroads are under existing conditions and in respect to securing money to improve their facilities. The financial markets of Europe are closed against them. The financial markets of America are absorbed by the war needs of our own government and by the superior inducements offered by industries which promise large and attractive returns.

Under these circumstances what is it wise for Congress, in the public interest, to do? Shall it define profits in such a way as to make a fund "excess profits," which, in reality,

is not excess profits, and to take a part of it in taxation; or shall the railroads be encouraged to use all of the earnings they properly can in the way of new facilities and to accumulate some margin of safety with the view of gradually improving their credit—the latter for the purpose of taking advantage of any easing-up in the general financial situation, and in that event obtaining new capital to supply the facilities which are absolutely essential to the public.

In this connection it might not be improper to recall that one of the purposes of raising money by the American government in its recent war loan is to lend a part of it to France to improve its railroad facilities and a part of it to Russia to improve its railroad facilities. Is it wise to pursue this constructive and liberal course in respect to the railroad facilities of France and Russia, and at the same time to pursue a policy at home which will have a substantial tendency to deprive our own people and our own government of adequate railroad facilities? Not only are our own railroads not the subject of governmental assistance in the way of financial advances, but, in reality, it is proposed to impose upon them extraordinary taxes which will substantially limit their own ability to perform a vital public service, and which will go in part to improve the transportation facilities of France and Russia.

It seems manifest that a wise public policy requires the conservation of railroad earnings—already insufficient for the war and other public demands upon them—to the end that they may be available for use or as a basis for improved transportation facilities, instead of taking these earnings by the imposition of extraordinary taxes on them. They can be more useful to the public in transportation than in taxes.

It follows that no definition should be given of excess profits as to railroads which would not be true in fact, and which, instead of taking an amount which would otherwise go to the private owners in the shape of dividends, would in reality be reducing and crippling the power of the railroads to furnish the transportation facilities which the public absolutely needs. These considerations are respectfully submitted, and seem to justify the exclusion of the railroads from what we have attempted to show is, as to them, erroneously termed an excess profits tax as well as from the surplus tax, hereinafter to be considered.

It may be objected that the argument above presented will apply to all taxation of railroads, and is not confined to "excess" and "surplus" taxes. This view, however, does not seem to us either sound or necessary. The thing to be preserved is the adequacy and efficiency of the railroads. The conclusion to be reached is what exaction, in the shape of taxes, can be made of the railroads without unduly crippling or reducing their adequacy and efficiency as transportation agencies. The line must be drawn between taxes which, according to this test, can properly be imposed and those which it would be injudicious to impose. It seems to us it should be drawn so as to exclude the railroads from the so-called excess profits and the surplus tax, but that, with the lights now before us, it is unnecessary to exclude them from the four per cent income tax.

If, however, it be considered impossible to exclude the railroads as a class from the "excess profits" tax, on the idea that some of them may be such heavy earners as would enable a particular company to provide the proper facilities and at the same time pay the tax, there should be adopted, at least as to the railroads, a definition of "excess profits," which would avoid the taking, in any form of taxes, money which the public interest requires should be retained by the railroads for the purpose of improving their facilities or for the establishment for them of reasonable credit.

It is respectfully submitted that a margin of allowance for this purpose would be an earning power of at least

eight per cent on the value of the assets of the company, whether these assets may have been acquired through borrowed money or by money paid in in the shape of capital contributed by the owners. The proposed act does permit, under certain circumstances, an allowance of six per cent on capital as defined in the act, but the definition of capital is in the act of such a nature as to exclude a very large part of what is really the company's capital.

The definition of capital as proposed in the act is as follows:

... fair average value of the assets actually invested and employed in the trade or business less the average amount of the liabilities incurred in respect to such trade or business.

This would result in imposing an income tax on interest paid out on debts; in the taking of a considerable part of the net income of these companies under the guise of an excess profits tax, as between the various companies, would impose a very different and inequitable burden. For example, if a company be capitalized so that two-thirds of its capital is represented by stock and one-third by bonds, it is manifest that this tax would bear in a very different way on it from the way in which it would bear upon a company where two-thirds of its capital was bonds and one-third stock.

Taking the case of two roads having the same property investment, the same aggregate capitalization and the same net earnings, but having their aggregate capitalization distributed between bonds and stock in the proportions just mentioned, and whose earnings were subnormal in the pre-war period, the amount of the deduction for normal profits, before "excess profits" are ascertained, would be very different in the two cases. In the one case, six per cent would be allowed as a deduction on approximately two-thirds of the asset values; whereas, in the other case, the deduction would be six per cent on approximately only one-third of the asset values. And yet the company which has been able to finance itself so as to have two-thirds of its capital represented by stock, would under this definition, have the smaller "excess profits" tax to pay, which would be clearly inequitable.

"SURPLUS TAX"

The considerations which have been above given in respect to the wisdom of imposing an excess profits tax are equally applicable to the proposed surplus tax. At least, a definition of "surplus" should be given which, while subjecting to taxation a company exceptionally strong and able to keep its facilities up to the public requirements, would avoid taking from other companies, not so fortunately situated, the funds necessary either as a means to protect credit or for the direct purpose of investment in improved facilities.

The tax is applicable only to that part of the net income that remains undistributed at a certain date, thus excluding from the tax all dividend distributions that may be made within the prescribed time. Manifestly the effect of this is to stimulate the distribution of profits in the shape of dividends. However wise this policy may be in respect to companies which have large accumulations of profits, it cannot be considered as having a wise application to the railroads when their relation to their undistributed income is correctly appreciated.

It is a fact which may be stated as almost universally true that there is no hoarding by railroads of their earnings. Where the books of the railroads show a large accumulated surplus, that surplus is not found in the bank in the shape of money subject to check, but in almost all cases has been plowed back into the property in the shape of improved facilities. If a substantial part of this surplus is to be taken under the taxing power, the money to pay it must be either withheld from its accustomed expenditure on the property, or a part of the property in which it has been invested

must be sold to pay it, or money must be borrowed for the purpose.

Credit is not maintained, but is impaired, by a policy which, instead of favoring the accumulation from earnings of an adequate surplus, forces exceptional distribution of such earnings to the owners, because the office of a surplus is to make and keep up credit and to furnish a basis for the improvement of facilities essential to the public needs. It seems, therefore, manifest that the policy of this surplus tax, which is to force large distribution of annual earnings, is not applicable in the case of the railroads.

As regards this tax, it should be borne in mind that it bears proportionately harder on the poorer roads which have not felt able to declare dividends, but resort to the conservative policy of using what earnings they have upon their properties devoted to the public service. In some sections of the country—notably the South—the present standard of transportation facilities has been attained by the adoption of this policy, and would not have been possible if the railroads had distributed their earnings in dividends. It may well be questioned whether any policy of taxation is wise which would discourage such a tendency and would result in a larger tax burden being placed upon roads which, for the purpose of improving their transportation facilities, refrain from declaring dividends.

Whether, therefore, the railroads should be absolutely excluded from this tax, or should be retained within its scope by a definition which would subject to the tax any company whose earnings may happen to be large enough to justify its imposition, is a matter for Congress to decide. If it be determined that the railroads should not be entirely excluded as a class, then they should be encouraged to accumulate, in the shape of a surplus, an amount reasonably adequate for the purpose of improving their facilities, and for the equally public purpose of establishing and stabilizing their credit.

It is submitted that if the railroads are permitted to deduct from their undistributed net income, before the surplus tax becomes applicable to it, an amount of three per centum of the value of their assets, no more would be reserved than sufficient for the essential needs of the company in the way of improving facilities and for the purpose of establishing and stabilizing credit.

This 3 per cent limitation will leave subject to the surplus tax all annual net earnings which are withheld, but which public policy might, as a war measure, require to be declared out in dividends and become subject to tax as part of the income of the stockholders.

It may be safely stated that the suggested annual allowance of 3 per cent on the assets as a surplus would receive the endorsement of the best financial and economic authorities.

UNEQUAL AND INEQUITABLE RESULTS

In a previous part of this memorandum reference was made to the unequal and inequitable results upon different railroads of the system of taxation proposed in the pending bill. As indicative of this inequality and unfairness of burden, attention is respectfully directed to the following cases which are worked out upon the basis of the earnings for the calendar year 1916.

First. Compare the Pennsylvania Railroad with the New York Central:

	Pennsylvania Railroad	New York Central
Total assets, December 31, 1916	\$1,058,826,941	\$1,076,919,058
Outstanding Capital:		
Stock	506,458,948	249,590,460
Funded debt	250,356,844	673,070,217
Total net income	46,558,313	46,374,101
Net income (less dividend income)	9,815,260	38,274,404
Estimated war taxes:		
Normal income tax at 4%	1,192,610	1,410,676
Excess profits tax		2,277,613
Surplus tax at 15%	551,663	2,517,385
Total estimated war taxes	1,744,273	6,205,674

These two railroads are active competitors—their total capitalization is about the same—their total income for 1916

was about the same. The structure of their capitalization, however, is very different. The Pennsylvania having approximately two-thirds stock and one-third funded debt, while the New York Central has approximately one-fourth stock and three-fourths funded debt. Under the proposed tax system the Pennsylvania pays less than two millions in these taxes and the New York Central largely over six millions—the New York Central pays a fraction somewhat under 18 per cent of its net income (less dividend income), while the Pennsylvania Railroad pays less than 6 per cent; the Pennsylvania pays no excess profits tax, while the New York Central pays two millions and a quarter; and the Pennsylvania pays about half a million surplus tax, while the New York Central pays two millions and a half.

Second. Compare the Chicago, Milwaukee & St. Paul and Chicago & North Western:

	Chicago, Milwaukee & St. Paul	Chicago and North Western
Total assets, December 31, 1916.....	\$657,288,991	\$438,633,499
Outstanding Capital:		
Stock	233,287,984	152,606,807
Funded	490,547,155	205,909,500
Total net income.....	14,640,983	19,742,477
Net income (less dividend income).....	14,469,164	18,194,845
Estimated war taxes:		
Normal income tax at 4%.....	578,767	727,793
Excess profits tax.....	99,221	977,377
Surplus tax at 15%.....	99,221	1,286,638
Total	677,988	2,991,808

Thus it will be seen that the Chicago & North Western pays as taxes under this proposal considerably more than 16 per cent of its income (less dividend income), while the Chicago, Milwaukee & St. Paul pays a fraction over 4 per cent. Other inequalities will likewise appear by reference to the foregoing table.

Third. Compare the Chicago, Burlington & Quincy with any of the above-mentioned roads.

	Chicago, Burlington & Quincy
Total assets, December 31, 1916.....	\$544,305,600
Outstanding Capital:	
Stock	110,839,100
Funded	176,487,900
Total net income.....	33,582,610
Net income (less dividend income).....	33,572,610
Estimated war taxes:	
Normal income tax at 4%.....	1,343,304
Excess profits tax.....	1,400,299
Surplus tax at 15%.....	2,377,633
Total	5,121,236

From this it will be seen that the New York Central, which pays in these taxes about 18 per cent of its net income, and the Chicago & North Western, which pays about 16 per cent of its income, and the Burlington, which pays about 15 per cent of its income (less in each case dividend income), are somewhat in the same class, while the effect of the proposed tax on the Burlington contrasts in a very marked degree, and shows marked inequality when compared with the result on the Pennsylvania and Chicago, Milwaukee & St. Paul, the first of which pays a little less than 6 per cent on its net income, and the second of which pays a little over 4 per cent on its net income.

A careful study of the amendment relating to the deduction of dividends received will demonstrate that there is no sound reason for the qualification which excludes from the deduction a portion of the dividends received from other corporations. Since some deduction of dividends is proposed, the principle is recognized that earnings should not be subjected to double, triple and quadruple taxation in the course of their transfer from one corporation to another in the form of dividends. The qualification, as we understand it, is at variance with the fundamental principle which justified the amendment. The qualification necessarily results in double, triple, etc., taxation, of a substantial part of the net income of many corporations.

The provisions in reference to the deduction of dividends in the bill is as follows:

(d) For the purpose of the tax imposed by subdivision (a) of section ten, the income embraced in a return of a corporation, joint-stock company

or association, or insurance company shall be credited with the amount received as dividends upon the stock or from the net earnings of any other corporation, joint-stock company or association, or insurance company, which is taxable upon its net income as provided in this title, less that proportion of such amount which the amount received by the distributing corporation, joint-stock company or association, or insurance company from similar sources bears to the entire net income of such distributing corporation, joint-stock company or association, or insurance company.

This provision operates as follows:

The Union Pacific owns all the stock of the Oregon Short Line, and through that company controls a through line to the Pacific coast, which renders the public a most important service. The Oregon Short Line paid to the Union Pacific, as its sole stockholder, a dividend of \$8,000,000. But as 17 per cent of the entire net income of Oregon Short Line was derived from dividends received from other corporations, the Union Pacific is entitled, under the finance committee's qualifying amendment, to deduct, in computing its own income tax, only 83 per cent of the dividend received from the Oregon Short Line, or \$6,640,000, leaving 17 per cent, or \$1,360,000, to be taxed as part of the net income of the Union Pacific, although it has once been taxed as income of Oregon Short Line.

Another striking example is afforded by the Atchison, Topeka & Santa Fe. Many years ago that company mortgaged its property by instruments which contained after-acquired property clauses. When it became necessary to extend its lines in New Mexico, it was obliged to form a new company for the extension, the Atchison furnishing the capital and taking the stock of the New Mexico company—otherwise the property in New Mexico would have come under the previous mortgages of the Atchison, and would not have afforded a basis of credit necessary for the proposed construction.

It subsequently became desirable to extend the Atchison lines into Texas. The laws of Texas would not permit a foreign corporation to build a road in that state; consequently, a separate corporation was necessary for the purpose. The New Mexico company—a subsidiary of the Atchison—took the stock of this Texas company, and thereby the Atchison became "a holding company in the second degree," but became so as a means of creating a trunk line through New Mexico and Texas.

Under the operation of the proposed amendment, any dividend received by the Atchison from the New Mexico company, any part of which was made up from a dividend from the Texas company, must be reduced proportionately, although the whole transaction was merely a method of furnishing a great through system of railroad, and the form that it took was made necessary by business considerations and by the laws of Texas above mentioned. Inasmuch as the earnings of the Texas company would be taxed in the hands of that company, it would seem highly inequitable, and in violation of the principle of the proposed bill, which allows some deduction of dividends, to tax these earnings again when they reach the Atchison.

We therefore submit that dividends received from other corporations should be deducted in their entirety.

That part of income taken by the Government as "income" and "excess profits" taxes should be deducted in arriving at taxable income, just as the proposed law permits the deduction of all other taxes. Otherwise there will result a tax on taxes. Neither an individual nor a corporation should be required to pay a tax upon money which is required to be surrendered to the government in the form of taxes.

RESTRICTED RAILWAY TRAVELING IN DENMARK.—Owing to lack of coal in Denmark, which has already caused the limitation of railway traveling, the ministry of the interior has now further authorized the state and private railways to make restrictions as to the kinds of goods to be carried.



Women Sorting Scrap on the New York Central at Collinwood, Ohio; the Coil Springs and Other Material in the Foreground is Serviceable Material Picked Out by the Women

Women Well Adapted to Scrap Dock Labor

Their Employment at the Collinwood Shops of the New York Central Has Passed the Experimental Stage

CONDITIONS prevailing on account of the war, make it necessary to resort to many unusual means for the carrying on of the work of various departments of the railroads, the service of which is so essential during these trying times. Many of the male employees have enlisted; the ranks are gradually being depleted and it follows that

paid to men for the same class of labor and undoubtedly will become a regular part of the working force. It has been interesting to see the energy displayed by the women on this work. At the Collinwood scrap dock they have largely displaced colored labor imported from the South, the latter being more or less migratory and unreliable after pay day. They are much more steady and are very apt at learning to sort out usable material from a pile of scrap. They seem to possess a natural instinct for sorting out and saving good material. At times they may be seen criticising each other for discarding a bolt, nut or washer that should have been reclaimed. They respond readily when called upon to unload material from a gondola car. Since the photographs were taken they have adopted bloomers or overalls, thereby greatly



Women Reclaiming Bolts and Other Small Material from the Bins at the Collinwood Scrap Yard

work such as sorting scrap and many other operations must to a certain extent be performed by female labor.

The extent to which women may be used at the scrap docks, sorting and handling miscellaneous material is brought out clearly by the illustrations. The photographs were taken at the New York Central scrap dock at the Collinwood, Ohio, shops. The women have been employed here for some time under the jurisdiction of the general storekeeper of the Lines West. What at first was considered an experiment is now pronounced a success, all things considered, and has grown beyond the experimental stage.

The women are paid at the same rates of wages that were



A Group of Women Who Have Replaced Men as Scrap Handlers at Collinwood

enhancing their ability to climb on and off cars and to get around generally. They find that they can work much more freely and that they are in less danger when wearing overalls, as compared with their customary apparel. A dress often catches on projecting pieces of iron, making their work more or less hazardous.

YARDMEN'S STRIKE AT CHICAGO

A strike of switchmen belonging to the Brotherhood of Railroad Trainmen was called on nineteen roads in the Chicago switching district at 6 A. M. on July 28 and continued until 5:45 A. M. July 30, when, through the intervention of officers of the other three railway brotherhoods, headed by L. F. Sheppard, acting president of the Order of Railway Conductors, a settlement was reached. Although the Managers' Conference Committee of the Chicago roads proposed mediation by the Federal Board of Mediation and Conciliation, and George W. W. Hanger, a member of that board, personally tried to induce the men to submit their case to the body he represented, the switchmen were uncompromising in their insistence upon the demands which they had made. In substance, they wished to establish the closed shop in favor of members of their organization and to deprive the railroad managements of the power to appoint yardmasters and assistant yardmasters.

With reference to the specific demands of the Brotherhood of Railroad Trainmen, the Managers' Conference Committee made the following statement:

"First, 'In the employment of yardmen B. of R. T. men shall be given preference.' If this rule should be adopted the railways would be prevented from employing any but B. of R. T. men when there were any of them available, although more experienced and better qualified men might be available. The railways proposed that the rule should be made to read, 'In the employment of yardmen, experienced men will be given preferred consideration and B. of R. T. men will not be discriminated against.'

"Second, 'Yardmen discharged can only be reinstated by mutual agreement between officers of the company and the properly authorized committee representing them.' On a road having a contract with the Brotherhood of Railroad Trainmen the committee of this organization would be the only one representing the men. Therefore, if a non-union man or a member of the Switchmen's Union, of North America, which classes include 60 per cent of all the yardmen in Chicago, should leave the service for any cause, he could not, under the proposed rules, re-enter the service without the consent of the Brotherhood of Railroad Trainmen committee. For obvious reasons, this consent might be difficult to obtain. In other words, under the first rule the railway would be prevented from employing any but B. of R. T. men and under the second it could be prevented from reinstating any but B. of R. T. men. The managers' committee proposed in place of the second rule that 'Yardmen dismissed will forfeit all seniority rights, unless reinstated within one year.'

"The adoption of the rules proposed by the B. of R. T. would in time eliminate all non-union men and all members of the Switchmen's Union from the service of roads having contracts with the B. of R. T., while members of the B. of R. T. employed on roads having contracts with the Switchmen's Union would be left undisturbed.

"Third, 'In the employment of yardmasters and assistant yardmasters the senior qualified yardman shall be given preference.' On a road having the proposed closed shop for the benefit of the members of the B. of R. T., the senior yardman would, of course, be a member of that organization. The representatives of the Brotherhood of Railroad Trainmen charge that in appointing assistant yardmasters and yardmasters the railways have discriminated against members of their organization. The managements of the railroads have used their discretion in appointing assistant yardmasters and yardmasters, putting into those positions the men regarded as best qualified for them, whether yardmen, yard-clerks, trainmen, or in whatever branch of the service they may have been. The fact that about three-fourths of the assistant yardmasters and yardmasters of Chicago lines having contracts with the

B. of R. T. have been appointed from the ranks of yardmen refutes the charge of unfair discrimination. The rule proposed by the Managers' Conference Committee is that 'in the appointment of yardmasters and assistant yardmasters the senior yardmen will be given full and unprejudiced consideration.'

"The Commission of Eight in New York, representing both the four labor brotherhoods and the railways, decided that there should be a uniform meal hour for all employees in yard service; and the Managers' Conference Committee proposed action in accordance with this ruling. This the representatives of the B. of R. T. yardmen in Chicago declined to accept, thus refusing to abide by the decision of their own representatives on the Commission of Eight."

The demands made by the men were complicated by the fact that the railways had to consider not only the interests of the B. of R. T., who represented about 2500 of the switchmen employed in the Chicago terminals, but also nearly 2500 men belonging to the Switchmen's Union of North America and 1500 who were either non-union men or belonged to other labor organizations. In fact, J. G. Connors, assistant international president of the Switchmen's Union, notified the railroads that if the rules asked for by the B. of R. T. were adopted his organization would have no recourse but to strike.

Four hours after the strike had been declared reports from the various railroads involved indicated that all the way from 25 to 100 per cent of the normal business of the roads was being handled. This was very encouraging in view of the fact that a strike is generally considered won if 25 per cent of the normal business is handled on the second day. Some of the roads found it necessary to place embargoes upon the movements of live stock and perishables. Conditions on Sunday showed continued improvement. In comparison with preceding Sundays recently the percentage of switching crews working varied from 25 to 100 per cent with crews of 75 per cent or over on most of the lines.

Two acts of violence by strikers or strike sympathizers occurred on the Chicago & Alton about one o'clock Sunday morning. Three members of the B. of R. T., namely, Lee Hunt, who has been switching foreman at the Alton's Harrison street yard, C. C. O'Connell and F. T. Payne, switchmen, emptied a wheelbarrow load of bricks from a viaduct on some switchmen at work below. Two were struck on the feet by bricks but were not seriously hurt. An Alton watchman fired his revolver at the men, following which Hunt and O'Connell stopped and threw up their hands. They were turned over to the city police and will be prosecuted. At about the same hour at the Glen yards of the Chicago & Alton a switch was maliciously thrown in front of seven heavily loaded coal cars moving at considerable speed, derailing them and blocking the track for nine hours.

Late Sunday afternoon Mr. Sheppard and other brotherhood leaders arrived at Chicago and called at the offices of the Managers' Conference Committee, asking for a statement of circumstances in connection with the strike. As a result of conferences which ensued the following settlement was agreed to: First, that the men be returned to their positions at once without prejudice or loss of seniority. Second, that the questions at issue be disposed of as follows: (a) The meal period question to be settled by the Commission of Eight at New York; (b) the appointment of yardmasters, the reinstatements and employment of new men to be settled by a board consisting of Messrs. L. F. Sheppard, chairman; W. M. Clark, M. W. Cadle, H. E. Wills, L. J. Griffing, Arthur J. Lovell and S. A. Boone, representing the B. of R. T.; and the Managers' Conference Committee representing the railroads. The rights of all other employees are safeguarded by a clause reading: "It is agreed that the matters at issue are to be settled without the adoption of the closed shop rule or any rule that might fairly be considered as equivalent to such."



2

Outbound Freight, Pier 4, New York City

Electric Tractors at Pier 4, New York

Increasing the Capacity of a Busy Station Where Acquisition of Additional Land Is Out of the Question

A NOTABLE example of economical handling of package freight from wagon to freight car by means of electric tractors is that to be seen in the plant recently installed at the station of the Pennsylvania Railroad, Pier 4, North River, New York City. This station is one of the old-

The outbound platform of this station, fronting the street, is on a level with the tailboard of the wagons which bring merchandise to the station. When a wagon brings a shipment for a single destination which is large enough, the packages are loaded directly on to one of the four-wheel trucks and the truck is run over the scales. Smaller shipments are moved by hand trucks to the scales, thence to the proper four-wheel truck.

From the north to the south side of the station there are nine scales. From the scales freight is taken to one of the four-wheel trucks, a row of which, standing at the "loading



Loading Direct from Dray to Four-Wheel Truck

est in New York, and one in which is done a very large outbound business, and the electric installation now includes 4 tractors and 225 four-wheel "trailers." This improvement has effected a marked increase in the capacity of the station and at the same time it is an important labor-saving proposition, though the distances which freight has to be trucked are not very long. The scheme answers directly the demand from Washington for conservation of man power as a measure to promote the success of the war.



3

A Through Train

wharf," is seen in photograph No. 2. The numbers displayed above these trucks, 45, 43, 166, 41, 40, 1 to 24, 38—indicate the loading numbers of cars for specific destinations.

Forty-one, for instance, may be the Chicago car, and 40 that for Cincinnati. These numbers are for permanent use and the freight handlers familiarize themselves with them. The tractor in the center of this picture, coming down the ramp, is drawing a truck which has been loaded direct from a wagon. The other trucks are on a level 20 inches lower.

The cars into which the freight is loaded stand on floats tied to the dock; and the space between the "wharf" at which the trucks are loaded and the ramp over which they are moved—up or down, according as the tide is high or low—on to the platform in the center of the float, is called the yard. Each float has two tracks with six cars on each track, and a 7 ft. platform between the tracks. The slip affords space for four floats (48 cars). The space between the wharf at which the trucks are loaded and the outer edge of the dock is about 75 ft. wide. In this "yard" the trucks are marshalled into trains of 1, 2, 3, 4, or more trucks. Photograph No. 3 shows a train consisting of a tractor and three trucks. Photograph No. 4 shows a tractor and four trucks going up the incline to the platform on the float. The tractor leaves the trucks opposite their proper cars and they are then pushed into the cars by the stowers, as shown in photograph No. 5. The tractors, as will be seen, occupy but little space and are readily turned on the 7 ft. platform of the float. The leading wheel, by which the tractor is steered, is 6 in. in diameter and the main wheels are 12 in. in diameter. The trucks are 3 ft. wide and 6 ft. long, with 12 in. wheels. It will be noticed that the tongues of those trucks which are at rest are inclined upward but without the ordinary hook or chain to hold them in position. This upward position is maintained by means of a special device in the connection by which the tongue is secured at its lower end, to the body of the truck. The release of the tongue from its upward position and the coupling of the truck to the tractor is effected by a single simple motion. The floors of the trucks are 20 in. high and this is the height of the wharf behind the trucks shown in photograph No. 2.

The man on the platform who directs the outward move-

discouragement and waste of time so common at New York City freight piers—the long line of waiting trucks in the street—has been practically abolished, so far as Pier 4 is concerned. From time immemorial freight stations closing at 4:30 p. m. have been obliged to send a man out on the street at that hour and give tickets to the teamsters, lined up for from one to a dozen blocks, and give them admission tickets. Such tickets show that the holder has done his part toward delivering his load at the freight house before the closing hour. The teamster who has no ticket is shut out. Many schemes have been proposed for curing this trouble.

For the foregoing information we are indebted to H. C.



The Stowers' Part

Bixler, superintendent of stations and transfers of the Pennsylvania Railroad, who gives the credit for the marked success of this improvement in efficiency to M. Townsend, the veteran agent at Pier 4, and to his general foreman, C. M. Sullivan.

CEMENT IN GUATEMALA.—A new cement mill, with a capacity of from 50,000 to 100,000 barrels of cement per year, has just been opened about one mile from Guatemala City by American interests, acting under a special concession of the Guatemalan Government. The plant has been under construction for two years, and involves not only the mill itself, but two miles of railway connecting with the port. Practically all the machinery was manufactured in the United States. The new company is restricted under its franchise to a maximum charge of \$4 a barrel for its product. The managers state that they will be able to manufacture cement at a cost of \$1.25 a barrel.

RESTRICTED TRAVEL IN GERMANY.—Very urgent warnings against all avoidable traveling are now being issued by the German railway authorities, observes The Times (London) in its "Through German Eyes" columns. The public is told that the restrictions are much greater in England and France, that the German measures are very lenient, and that people are wisest to stay at home, where they are certain of food, even if the quantities of food are small. At the same time it is admitted that the Germans now have an unusual need of holidays and sufficient provision of really necessary trains is promised. It is worth noting that, instead of abandoning the reservation of seats, the German authorities have established the rule that all tickets for "holiday trains" must be bought in advance, and every ticket secures a place in the train. The Germans are solemnly assured that as regards coal they are better off than all other belligerent countries, but they are warned that there will be great privations next winter if the weather is not mild.



From Pier to Float; On the Up-Grade

ment of the four wheel trucks is called a despatcher. He sees that the trucks are moved to the proper position in the "yard" and calls for an empty truck to take the place of each loaded truck which goes out. The marshalling of the trucks into suitable trains by the tractors is supervised by a yard master and one assistant.

These tractors and trucks are busy from about 11 a. m. to the closing hour, 6 p. m.; and in the earlier part of the day, before the outbound movement becomes heavy, they are used to some extent for moving inbound freight. In the movement of outbound freight the tractors have given such a good account of themselves that the standing cause of complaint,

How One Road Increased Its Train Load

Ratings Established by Road Tests; Simple Methods Used for Checking Performance of Each Train

By J. Lowell White

Assistant to the General Superintendent of Transportation,
Atlantic Coast Line, Wilmington, N. C.

IN response to a request for information as to how a certain large increase in the trainload had been obtained on his road, one of the best known executives in the United States once wrote:

"The only way to increase your train load is to begin at the station platform and in the yard. See first of all that your car is loaded to capacity, if you can do so. After that see that enough cars are put back of the engine so that you utilize the full tractive power of the engine in the direction of heavy traffic. It is a question of enormous detail and constant watching and pressure all along the line every year and every day of the year."

The importance of securing a maximum car-load in any

maximum car-loading, would have to be hauled in another train at an added expense.

It is the purpose here to deal more with the methods to be employed in seeing that "enough cars are put back of the engine" so that the full tractive power may be used: this being a field in which operating officers have complete control. The methods described are those adopted by the Atlantic Coast Line and have, it is believed, been largely instrumental in increasing the net revenue train load from 235 tons in 1915 to 274 tons in 1916 and to 329 tons for the last six months of the calendar year 1916, a total increase of 94 tons or 39 per cent: during which period the average tractive power of road engines increased but 1.7 per cent.

TABLE 1

No. Cars	Estab. Rating	July				Aug.				Sept.				Oct.				Nov.				5 Months			
Per Train	Tons	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
45 to 49	2230	7	8	46	2215	7	9	46	2245	9	10	45	2274	1	1	45	2268	8	8	45	2233	6	36	46	2244
50 to 54	2200	25	27	52	2181	16	20	52	2166	32	37	52	2198	21	21	53	2215	19	20	52	2210	23	125	52	2194
55 to 59	2170	42	46	57	2107	34	42	57	2173	42	49	58	2178	59	60	56	2176	55	57	57	2175	46	254	57	2163
60 to 65	2140	26	28	62	2085	43	53	62	2144	17	20	62	2142	19	19	62	2145	18	19	62	2140	25	139	62	2131
Total																						100	554	56	2167

Column 1 - Per cent of total trains run
 " 2 - Number of trains run
 " 3 - Average number of cars per train
 " 4 - " " " tons "

Total tons (1,200,897) ÷ Average tons per train (2167)=554 trains
 " " " ÷ Ton rating for 60 cars (2140)=561 "

Saving 7 "

campaign for increased train load may be overlooked unless one remembers the indisputable fact that any given engine can pull more tons when its load is concentrated in a short, solid train that it can when the same tonnage is strung out in many cars with hundreds of wheels grinding the rails.

It has been demonstrated in road tests that an engine with 34,000 lb. tractive power can haul as much as 360 tons more over 0.6 per cent ruling grades in 40 cars than in 100. It then follows, since upward of 40 per cent of the gross ton load may be net revenue load (earning from one-half to one cent per ton mile), that the entire "out-of-pocket" expense of operating a given train may be paid by the revenue from this additional tonnage; which, were it not for the

Until November, 1915, the tonnage system had received very limited trial, being restricted to two or three districts and these of lesser importance from a traffic density standpoint. When the decision was reached to give the tonnage system a thorough and extensive trial it was with some doubts as to the wisdom in so doing on account of the large volume of perishable freight hauled; which class of business cannot be held to fill out tonnage trains. The problem presented was therefore: (1) To establish ratings with enough elasticity to permit ready adjustment to the character of train to be hauled. (2) To organize a system at minimum expense for computing the tonnage of each train. (3) To determine what each engine could pull at schedule speeds. (4) To construct a plan for reporting results which would be of value to officers in supervising the work.

* Received in the contest on "Increasing the Train Load." Other papers on this subject were published in the issues of June 22 and July 6.

This was attacked first by the issue of a circular which specified that the weight of "car and contents in tons" must be shown on every way-bill. All way-bill forms were revised to provide a definite space for this purpose. When this work was well begun, another circular was distributed, instructing yard-masters to record the weights of the individual cars in out-going trains on the yard record and conductors to give similar information for cars of in-coming trains on their switch-lists. With these circulars in force a record of every train in and out of terminals was available and enabled those in charge, through a study of the tonnage actually hauled before any ratings had been fixed, to pick a weight for the first test trains which would be somewhere near the weights finally adopted. This saved considerable time in making the tests.

The officer under whose direction this work was carried out had been much impressed by an article by O. S. Beyer, Jr., entitled "Scientific Train Loading: Tonnage Rating" which appeared in the *Railway Age Gazette* of September 17, 1915, and it was decided to make trials to find out whether an adjusted (for length of train) system would secure greater train loads than a flat system. At the time the tests were begun large numbers of empty cars were being

clearly demonstrated. Table No. 1 covering the operation of through freight trains in the direction of traffic on one district for a period of five months will at least give good ground for argument pro and con. There will be those who maintain that, owing to the large proportion of trains having between 55 and 59 cars, a flat rating of 2170 tons should be fixed for practical operation for all trains. Those opposed will answer that in August 43 per cent of all trains had over 60 cars and that, with a flat rating of 2170 tons in effect, while these 53 trains might have gotten over the road without actually stalling, it is probable that the movement would not have been as satisfactory as under the adjusted system.

If one is willing to admit that the load of 2140 tons would be the only safe one to use for a flat rating for a 60-car train, then the figures shown make an actual saving of seven trains for the adjusted system; which for the 172-mile run in question would mean (on a basis of 50 cents per train mile) an actual economy of \$1204 in the five months' period. The opinion of the writer is that the adjusted system makes for smooth operation, costs no more to work than a flat system and may save real money in the long run.

A word of caution may be added for those who have in mind the introduction of an adjusted rating. In establish-

Atlantic Coast Line Railroad Company

STATEMENT OF TRAINS RUN, CARS HANDLED, AND TONNAGE

Form 757

Norfolk

District,

First

Division, 24 Hours Ending 11:59 P. M.,

Jan. 1st. 1917.

Any uncommon train movement should be fully explained, either on face of report or by memorandum attached to report.

Chief Dispatcher

FREIGHT TRAINS

Train No.	Engine No.	Engine Mileage	From	To	Train Mileage	Actual Leaving Time	Actual Arriving Time	Conductor	Engineman	Per. to Serv. City	FREIGHT CARS HANDLED			TRAIN LOAD IN TONS							
											Loaded	Empty	Total	Total	Average Cars and Tons	Engines Rating	Per Cent of Rating				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19			
X 407		115				A	B	115	830a	541p	Black	Brown	1	60	32	92	Out 52 In 92	2700 2700	2700	A2750	98
						B	C										Out 70 In 70	2180 2180	2180	A2190	100
						C	D										Out 70 In 50	2180 1780	1980	A2900	68
X 818		115				A	B	115	900a	900p	Smith	Jones	1	80	0	80	Out 80 In 80	3800 3800	3800	A3800	100
						B	C										Out 55 In 55	2790 2790	2790	A2790	100
						C	D										Out 55 In 55	2790 2790	2790	A3550	79
X 400		115				A	B	115	1201a	630a	Hart	Milliken	1	55	18	73	Out 73 In 73	2850 2850	2850	A2850	100
						B	C										Out 55 In 55	2030 2030	2030	B2030	100
						C	D		B a/c	25 Perishables							Out 55 In 55	2030 2030	2030	B2650	77
																	Out In	22950 25310	25310	90.8	

run south, which was also the direction of the movement of company coal, so that it was an easy matter to secure test trains; first of loaded coal cars and then of empty box cars: the two limits of all train operation, between which all other trains of however mixed a character must fall.

The tests demonstrated clearly that in most cases more load could be hauled in a short train than in a long one, but it is interesting to note that several instances were found where, on account of the broken character of the country, the engine was able to haul as much in a long empty train as in a short loaded one, the only assignable reason being that, owing to the "saw-tooth" character of the profile, when the engine was hauling the coal train it would have the whole train on the ruling grade at one time, while with 90 or 100 cars some part of the train would still be running down one hill when the engine was nearing the top of the next one. Adjusted ratings with friction allowances of from 4 to 15 tons per car have accordingly been established on 10 out of 12 operating divisions. How much advantage is being obtained from the adjustment feature has not yet been

ing the rating it will probably be advisable, in order to insure the most successful results, to base the rating on the smaller number of heavily loaded cars and then to make the friction allowance slightly higher than 5, say 7 tons per car; because in mixed trains if many loads are on the rear end it may be found that the allowance of five tons is not enough in a long train, as such a train will pull harder than one where the weight is evenly distributed, as would be the case in the fully loaded or empty test trains.

The tests to fix the ratings were simple in character, being conducted by an observer accompanied by the road foreman of engines and the trainmaster. Two or more weeks were spent on each district until it was determined what was the right load for a given class of locomotive. Tests were then run in order to find out how much reduction from the maximum tonnage would be necessary in order to permit trains to make the schedules of certain fast perishable runs. The results of these tests were designated as "A" (slow) and "B" (fast) ratings and as such were put into effect at the conclusion of the tests on each district.

With the ratings established the problem remained of constructing a report which would show sufficient data to enable officers to check the performance of every train readily. The ideal method would be to compute the gross ton miles of each run which would then be compared with the potential gross ton mileage of which the engine is capable. Such statistics, however can be obtained only at considerable expense. To make this unnecessary the form of record shown was devised. In using this system the conductor reports to the despatcher the number of cars and tons in his train before leaving the yard, which information is recorded on the train sheet in a space provided for the purpose.

The conductor is also required to report the cars and tons which his train takes into and out of the designated intermediate tonnage terminals, which information is also recorded on the train-sheet, so that at the close of the day the record is complete from which Form 787 is prepared. As a result, the performance for the day comes to the office of the general superintendent of transportation with the least possible delay. In that office a stenographer is employed who checks the correctness of ratings, footings, etc., and writes all letters which are sent out having reference to the supervision of the loading. Small adding machines have been placed in the principal yard offices to enable yard clerks to foot the tonnage with speed and accuracy and chief despatchers have been provided with wide carriage typewriters on which to make up the report. Four days after the close of the month a statement is placed before the general manager, giving the results for the preceding 30-day period on each district or division. Outside of the salary and expenses of the supervising officer the whole cost of the system here described is the salary of the stenographer and the price of the adding machines and typewriters furnished to yards and despatchers.

with the "B," or fast rating. An examination of the necessities of the service was made and as a result instructions were issued under which "B" trains could only be run between certain fixed hours each day. Consequently while on one district only 58 per cent of all the tonnage hauled was handled in "A" trains in March, in June 71 per cent was so handled, with a resulting saving of 7 trains.

Indirectly, too, it is hoped that these tonnage figures will be of use in increasing the train load, because they have furnished a definite basis on which to make recommendation for grade reduction. For instance, on the run from A through B and C to D it was found necessary on account of one comparatively short ruling grade between B and C to fix the rating over the tonnage district B-C at a very much lower figure than on either of the districts A-B or C-D. The tonnage figures from Form 787 supplied the data to show that there would be sufficient saving made through reduced train service by the removal of the tonnage restriction between B and C to offset the cost of the grade reduction work.

PASSENGER CAR FLOOR INSULATION

A mineral insulating material for use in passenger car floor construction, which somewhat resembles wool felt in appearance and texture, has recently been placed on the market by the Tuco Products Corporation, New York. This material, which is marketed under the trade name of Tucork, is manufactured from a material secured in rock form, which is melted and blown into a mineral wool. This in turn is mixed with a liquid binder, the mixture being poured into containers of proper depth, depending upon the thickness of insulation desired. These containers have a wire mesh bottom through which the liquid is permitted to drain off, the solid material settling on the screen in sheets, the



Tucork Floor Insulation Applied to a Steel Passenger Car

The above is an outline of the method by which one road has very materially increased its trainload. Corollary to it the tonnage statistics on Form 787 have developed some interesting facts which have directly and indirectly been the pointers toward ways and means of increasing the trainload on certain runs or territory. For instance, on one division it was noted from figures on Form 787 that a certain regular train was always underloaded. Circumstances were such that no more tonnage could be obtained, but the report showed that a smaller engine could handle the regular tonnage of this train, so the large engine was transferred to a point where its full power could be utilized. In another case the reports showed that many trains were being run

thickness of which depends upon the depth of the liquid mixture in the tank. After draining, the material is placed in drying ovens where all the moisture is evaporated, the material in its final form being made up of 85 per cent to 90 per cent enclosed air cells.

As it is of mineral structure, the insulation is fireproof and tests have shown that it is practically waterproof. After being submerged in water for a period of one hour, the material shows a gain in weight of only one per cent. The material is light and is manufactured in the form of blocks or sheets which are quickly and easily applied. A cement is furnished with which the blocks are secured to the sheets on which they rest and with which all joints are sealed.

General News Department

The Baltimore & Ohio, like the Pennsylvania, has called to the service of the company considerable numbers of retired employees.

Governor Brumbaugh of Pennsylvania has vetoed the bill, passed several weeks ago by both houses of the Legislature, to suspend, during the war, the excess crew law of that state.

The Fidelity Plate Glass Insurance Company has sued the Lehigh Valley Railroad for \$47,356, the value of glass, insured by that company, broken by the explosions at Black Tom, New York harbor, in July, 1916.

At Gibson, Ind., on Wednesday last, the freight transfer sheds and office buildings of the Indiana Harbor Belt were destroyed by fire, together with 101 freight cars. Estimated loss, \$250,000. Fire believed to have been started by sulphuric acid leaking from a carboy in a car.

The entire staff of the Oahu Railway & Land Company, Honolulu, Hawaiian Islands, has entered the Quartermaster's Reserve Corps of the United States Army for service on the islands, replacing regular army officers and enabling them to be transferred to the front.

W. E. McGarry, special representative of the Terminal Railroad Association of St. Louis on the St. Louis committee of the Commission on Car Service, has been elected chairman to succeed I. L. Burlingame, who has resigned on account of his heavy duties as general manager of the Terminal Railroad.

In the article entitled "Heavier Car Loading Would Eliminate Car Shortage," published in the June 22 issue of the *Railway Age Gazette*, the Patriotic War Number, the caption of the illustration shown on page 1294 misstated the loading of these cars. The pipe shown in this illustration was steel pipe and not wrought-iron pipe as indicated.

The Secretary of the Treasury has submitted to Congress an estimate of over \$5,000,000,000 additional revenue that will be required by the government this year for war purposes, in addition to the money already appropriated. The estimate includes an item of \$450,490,305 for transportation of the army and supplies.

Near North Tonawanda, N. Y., on the morning of July 21, about 1 o'clock, a local freight train of the New York Central was stopped (by application of air brakes) by ten armed men, who opened a car containing aluminum and carried off in automobiles 200 pigs of the metal, said to be worth \$4,800. The stolen property was subsequently recovered and four of the thieves were caught.

In the July 6 issue of the *Railway Age Gazette* it was incorrectly stated that the freight house of the Southern railway at East St. Louis, Ill., and 100 loaded freight cars standing on that company's tracks were destroyed by fire. As a matter of fact, the Southern's warehouse was not destroyed, nor even injured, and the number of loaded cars destroyed by fire was 26 instead of 100. Fifteen empty cars were also destroyed, and two cars were damaged, but the contents of these were not injured.

Secretary Wilson of the Department of Labor has recently given his personal attention to efforts to reach a settlement between the southeastern railroads and their shop employees who are demanding an eight-hour day and increases in wages. After six months of conference between the railroad managers and representatives of the men, relations were broken off and a strike was averted only by an agreement to refer the controversy to conciliators of the Labor Department with an agreement to abide by the decision of Secretary Wilson in case their efforts failed. The secretary has recently attended the conferences, which are expected to last for several days.

The Interstate Commerce Commission has issued a revision of valuation order No. 3, originally effective July 1, 1914. This order provided for a uniform system of reporting investment in

the physical property of every common carrier as a means of keeping valuation inventories up-to-date. The carriers were required to file reports for each fiscal year on June 30 thereof. The revision of the order, which is effective July 1, 1917, was issued to make the necessary adjustment in consequence of the change in the fiscal year. Following the report for June 30, 1917, carriers will be required to make a report for the six months ending December 31, 1917, and on each December 31 thereafter.

C. W. Egan, general claim agent of the Baltimore & Ohio, announces the appointment of a committee, of which he is a member, which has been organized for the purpose of educating railroad employees who may return from the war disabled. This committee was chosen at a recent meeting of heads of railroad claim departments. Its purpose is to teach men in the work of that department to which they may be best adapted and to provide places for them, so far as practicable, after they have acquired some degree of proficiency; and to endeavor to see that all such men receive pay as nearly as possible on the basis that they would have received had they not gone to war. The committee represents 117 American and Canadian railroads.

P. P. Claxton, United States Commissioner of Education, under the authorization of the Secretary of War, has advised the presidents of technical schools and colleges that students of such schools who are within the age limit of the selective draft should be treated in the same manner as workers in the industries which are devoted to the manufacture of war materials. Under this ruling exemption may properly be urged for students who give promise of special aptitude for the technical and scientific professions until they have finished their courses. As the successful prosecution of war depends in a large measure on the services of technical experts, it is important that the supply of men who have had advanced technical training should not be cut off more than is necessary.

According to a recent statement by W. R. Scott, vice-president and general manager of the Southern Pacific, this road will be forced to discontinue some of its trains within a short time unless the federal government opens up oil fields in the west which have been reserved on the theory that a navy to be built five years from now may need this supply. It is stated that the consumption of crude oil in California is now 60,000 gallons a day above production and that the Southern Pacific is now using from 9,000 to 12,000 more barrels a day than it can buy or produce. The Southern Pacific asks that it be permitted to supply its fuel needs from those of its lands which are under the government ban, to prevent the serious results which would follow a paralysis of a consideration portion of its train service at a time when traffic is exceptionally heavy on account of the war needs of the country.

Railroads Increasing Nation's Food Supply

Fairfax Harrison, chairman of the Railroads' War Board, has authorized a statement in which he says that the railroads of the West and Middle West are leasing at nominal rental for grazing and agricultural purposes millions of acres of lands. Virtually all of the land owned by these roads, which is not being used for operating purposes, is now under cultivation or being used by live-stock owners for cattle grazing.

And also, as heretofore noted, a number of the railroads are offering garden plots, rent free, to families along their right of way. The federal government has been offered 200,000 acres of "cut-over" land in Wisconsin by the Minneapolis, St. Paul & Sault Ste. Marie.

Among the western roads that are leasing all suitable lands in their possession for agricultural and grazing purposes are the Northern Pacific, the Union Pacific, the Southern Pacific, the Great Northern, the Oregon Short Line, the Chicago, Milwaukee & St. Paul, the Northwestern Pacific, and the Atchison,

Topeka & Santa Fe. The Santa Fe has leased every available acre that it owns.

Other roads leasing their idle lands are the St. Louis & San Francisco, the Pere Marquette, the Missouri Pacific, the Missouri, Kansas & Texas, the Chicago, Burlington & Quincy, and the Chicago, Rock Island & Pacific.

A Million Rations Lost

J. H. Elliott, general manager of the Texas & Pacific, has issued a public plea for the enactment of laws in Texas and Louisiana to prohibit live stock from running at large. Mr. Elliott says that his road killed enough live stock in the last fiscal year to provide sufficient meat to feed an army of 100,000 men ten days. The record shows 1,027 cattle, 552 hogs and sheep, and 165 horses and mules killed; an absolute waste. Many of the cattle were milch cows, the loss of which entailed a corresponding loss of butter and milk. Our armies are clamoring for horses and mules, and thousands and thousands of them are required. The road has spent large sums of money in building and repairing fences, and has educated its employees to do their utmost to prevent the killing of stock; but the waste cannot be stopped without the hearty co-operation of the public and the owners of stock. Many of the animals are killed inside station limits, where railroads can not build fences.

Canadian Pacific Men Win Honors in War

A Canadian Pacific bulletin recently issued contains a partial list of officers and employees of the company in military service in Europe to whom King George has awarded decorations and medals for bravery, gallantry and devotion to duty in the field. C. W. P. Ramsey, formerly engineer of construction at Montreal and now lieutenant-colonel in the Canadian army, has been made a Companion of the Order of St. Michael and St. George. Distinguished service orders were granted to G. S. Cantlie, formerly general superintendent of car service at Montreal, Ont., and now lieutenant-colonel; F. A. Gascoigne, formerly superintendent of car service at Montreal and now a lieutenant-colonel, and J. A. Hesketh, formerly assistant engineer at Winnipeg, Man., and now a major. Military crosses were given to thirteen Canadian Pacific men, distinguished conduct medals to ten, military medals to thirty-eight and a meritorious medal to one.

Canada's Railway Plans

The intentions of the government in connection with the proposed nationalization of railways were the subject of a report presented in parliament August 1 by Sir Thomas White, finance minister. He said it was proposed to acquire the entire Canadian Northern system of over 9,000 miles. This system has a common share capital of \$100,000,000, of which the government already owns \$60,000,000. A board of arbitration will be appointed to determine the value of the property.

The government contemplates the eventual acquisition of the Grand Trunk Pacific, but as to this no definite plans were presented. In the meantime, however, the government proposes to assist the G. T. P. with an advance of \$750,000 to be secured by mortgage, for which the Grand Trunk, as well as the Grand Trunk Pacific, would be liable.

War Industries Board

Robert S. Lovett, chairman of the executive committee of the Union Pacific, has been appointed a member of the new War Industries Board, created by the Council of National Defense, which, in addition to other duties, will assume those formerly discharged by the General Munitions Board. It will act as a clearing house for the war industry needs of the government, determine the most effective ways of meeting them and the best means and methods of increasing production; the sequence and relative urgency of the needs of the different government services, consider price factors, and, in the first instance, the industrial and labor aspects of problems involved, and the general questions affecting the purchase of commodities. It will work under the direction and control of the Council of National Defense, and be responsible through it, to the President. The members are: F. A. Scott, chairman; Lieutenant-Colonel Palmer E. Pierce, representing the army; Rear Admiral Frank

E. Fletcher, representing the navy; Hugh Frayne, B. M. Baruch, Robert S. Brookings, and Mr. Lovett, who will give his attention particularly to matters of priority. The various subordinate and co-operative committee of the Advisory Commission of the Council of National Defense, will continue their activities, and those whose work is related to the duties of the War Industries Board will co-operate with it.

Women on the Pennsylvania

Women and girls employed on the Pennsylvania Railroad now number more than 2,000 in the operating department alone; and the greater part of these have been employed within the last two months. There are 11 signal women, six student signal women, four women locomotive dispatchers, 19 station cleaners, 206 car cleaners, two draughtswomen, 104 messengers, 20 student messengers, 10 extra messengers, 23 station agents, one ticket seller, three bureau of information attendants, one pump attendant, 42 block operators, two machine hands, five street watchwomen, five upholsterers, one parcel room attendant, 12 drawbridge tenders and 18 store attendants, a total of 555; and in the lines of work more customarily followed by women there are 433 telephone operators, 84 matrons, 29 janitresses, two stewardesses, 78 stenographers, 1,102 clerks and one cook. The aggregate in all kinds of work is 2,360.

Last May, when the Pennsylvania first proposed to employ women on a large scale, the only women in the service were a few station agents, telegraph and telephone operators, etc., and a limited number of women clerks who had been experimentally employed in one of the large departments in the general office.

Personal Injury Fakir Trapped

One cold day last spring a man on crutches stumbled into the office of Oscar D. Aepli, general claim adjuster of the Chicago, Milwaukee & St. Paul at Chicago. He stated that he had slipped on a banana peel on a step while getting off a St. Paul train and had injured his spine as a result of the fall. Mr. Aepli sent him to a hospital for examination. While his case was something of a puzzle to medical men, he did not flinch when they applied an electrical test and stuck pins into his feet. Subsequently, Mr. Aepli, who scented that something was wrong, had the man shadowed and found that while he painfully picked his way to the street car from the St. Paul offices, as soon as he got inside, he put his crutches under his arm and strolled unconcernedly to a seat forward. Upon investigation it was discovered that he had successfully prosecuted similar claims against three other roads under three different names. He later wrote the St. Paul a threatening letter from Minneapolis under the name of a fictitious attorney, but without success. On May 3, he presented a claim to the Minneapolis & St. Louis for injuries alleged to have been received at Mason City, Ia. That road settled with him, but watched his subsequent activities and discovered him walking out of an alley without his crutches. He was thereupon arrested and is in jail under \$2,500 bonds. The St. Paul has also taken up the matter with federal authorities, who have issued a warrant charging him with attempting to obtain money under false pretenses and for using the mails for fraudulent purposes. In commenting on the case, Mr. Aepli said, "We shall prosecute this man. Our department endeavors to be fair with those who come to it, and we hope to give justice to this imposter."

Informal Railroad Operation

Railroad operations on the New Jersey & Pennsylvania Railroad have been resumed, after a bad wreck that blocked the road for six hours. The New Jersey and Pennsylvania [a line from Morristown, N. J., south, 25 miles, which suspended business four years ago for lack of enough income to pay wages and fuel] was bought at auction a few weeks ago by Frank B. Allen, who has since been making a good profit on the transaction by tearing up the rails of all sidings, and selling them to the Allies for use in France.

Mr. Allen, who is president of the road, was directing operations yesterday from the front seat of his automobile when an accident at one blow disabled 33 per cent of the rolling stock of the railroad. President Allen's motor car is fitted with flanged wheels, and hauls the two hand-cars, which constitute

the company's active "equipment." Suddenly the rear car jumped the track and broke a spring. The train crew had to lug the wrecked car to the blacksmith shop at Brookside station, near where the wreck occurred. The blacksmith and his helper worked over the broken spring for three hours before the car was repaired and the train crew could lug it back to the rails.

Just before the big wreck the train had arrived at Brookside station in response to a rumor that from an old siding overgrown with bushes a profitable lot of rails could be taken. Old rails are worth \$65 to \$80 a ton, depending on whether they are composed of rust or of iron.

About 100 tons of rails have been taken from the roadbed of this line. The rails weigh about 46 pounds to the yard. The removal of the rails does not mean that the company has expired. There is still a single track between termini, with a few turnouts. Two locomotives are being repaired at Paterson. Meantime President Allen has fitted his motor car with flanged wheels for railroad traction purposes. At night the flanged wheels are taken off, pneumatic rubber-tired automobile wheels put on, and President Allen rides home over the macadam.—*New York Evening Post.*

How Increased Prices Affect the Railroads and the Public

In a recent public statement R. J. Clancy, assistant to the general manager of the Southern Pacific, San Francisco, showed how much more oppressive increased prices are on the railroads than on the general public. He said: "The increase in the cost of a Mallet locomotive over what it was two years ago would buy a 160-acre farm at \$125 an acre, build a \$5,000 residence on it, provide for \$2,500 worth of implements and farm machinery, 25 dairy cows at \$75 each, \$700 for teams and wagons, a \$1,500 automobile, and still leave \$150 for incidentals—and this represents the increase in the cost of only one locomotive. Complaint is general among the people regarding the increased cost of living, resulting from increases in the cost of a dozen or so necessities of life, such as bread, butter, meat, potatoes, etc., but how about the railroad menu? The railroad consumes material, just as an individual consumes food, except that instead of a dozen articles, the railroad menu is 85 times that many, and its burdens, therefore, are in relatively greater proportion.

"Where the individual consumes pounds of bread, butter, meat and potatoes which have advanced 50 per cent, the railroad consumes tons of copper, steel, iron and kindred products which have advanced from 100 to 500 per cent. An individual may economize by substituting a cheaper article, such as eggs for meat and rice for potatoes, etc., and in this way neutralize the effect of increased prices, but a railroad is subjected to hard and fast standards which permit of little or no substitution, and cannot, like the individual, economize by substituting a cheaper article. Wage increases in other industries have been added into the cost of material and supplies to the railroad, and this, combined with wage increases to railway employees, increased taxes and a very large increase in the cost of fuel oil, produces an aggregate burden of ominous proportions."

Railway Revenues and Expenses for May, 1917

The net operating income of the railways of the United States for May, 1917, was more than May, 1916, by \$4 per mile, or 1.1 per cent, according to the monthly bulletin of the Bureau of Railway Economics.

Total operating revenues, \$345,773,079, exceeded those for May, 1916, by \$44,727,367. Operating expenses, \$238,682,879, were greater by \$41,272,388. Net operating revenue, \$107,090,200, increased \$3,454,979. Taxes, \$14,959,535, increased by \$2,333,548. Net operating income was \$92,079,548, which is an increase of \$1,147,753.

If spread over the mileage represented, operating revenues averaged \$1,498 per mile, an increase over May, 1916, of 14.7 per cent; operating expenses per mile, \$1,034, were greater by 20.7 per cent; net operating revenue per mile, \$464, shows an increase of 3.1 per cent; while net operating income per mile, \$399, increased 1.1 per cent. Taxes per mile rose 18.3 per cent.

This summary covers 230,905 miles of operated line, or about 90 per cent of the steam railway mileage of the United States.

For the eastern railways, operating revenues per mile were greater than those for May, 1916, by 11.4 per cent; operating expenses rose 22.2 per cent; net operating revenue decreased 9.6

REVENUES AND EXPENSES OF STEAM ROADS, MAY, 1917

Account	UNITED STATES										Compiled from monthly returns of the railways to the Interstate Commerce Commission and covering roads of Class 1, i. e., roads with annual operating revenues above \$1,000,000.									
	EASTERN					SOUTHERN					WESTERN					DISTRICT				
	Amount, 1917	Per mile of line, 1917	Amount, 1916	Per mile of line, 1916	Increase over 1916, Per cent	Amount, 1917	Per mile of line, 1917	Amount, 1916	Per mile of line, 1916	Increase over 1916, Per cent	Amount, 1917	Per mile of line, 1917	Amount, 1916	Per mile of line, 1916	Increase over 1916, Per cent	Amount, 1917	Per mile of line, 1917	Amount, 1916	Per mile of line, 1916	Increase over 1916, Per cent
Total operating revenues.....	\$345,773,079	\$1,498	\$1,306	14.7		\$50,326,574	\$1,178	\$1,019	15.5		\$139,169,370	\$1,079	\$911	18.4						
Freight.....	232,039,281	1,092	945	45.5		38,019,452	890	770	15.6		101,616,042	788	658	19.7						
Passenger.....	61,216,784	265	236	12.5		27,081,510	1,898	1,696	20.1		25,534,633	198	170	16.2						
Mail.....	4,990,546	22	22	0.0		1,960,703	33	31	5.8		2,281,133	17	19	9.0						
Express.....	8,886,000	38	32	19.1		4,322,396	73	62	18.1		3,352,517	26	21	24.4						
All other.....	18,646,488	81	71	13.8		10,502,730	178	158	12.3		6,391,045	50	43	16.1						
Total operating expenses.....	238,682,879	1,034	856	20.7		113,119,153	1,910	1,564	22.2		34,609,017	810	663	22.1						
Maintenance of way and structures.....	41,050,064	178	168	5.9		16,804,842	284	269	5.6		18,501,989	144	135	6.4						
Maintenance of equipment.....	57,993,973	251	217	15.5		27,962,335	472	405	16.7		20,303,292	157	140	12.2						
Traffic.....	34,852,984	153	123	24.4		2,048,689	35	34	2.6		2,367,861	18	18	1.8						
Transportation.....	124,187,224	538	411	30.7		61,597,405	1,040	789	31.8		45,708,674	376	276	28.3						
General.....	7,759,421	34	30	15.3		3,490,035	59	51	15.9		2,367,120	25	22	14.4						
All other.....	22,150,143	9	7	22.4		1,215,847	20	16	25.5		3,804,773	6	4	42.5						
Net operating revenue.....	107,090,200	464	450	3.1		43,157,982	729	806	9.6		48,214,661	371	316	18.2						
Taxes.....	14,959,535	65	55	18.3		5,968,607	101	86	17.6		6,556,378	51	45	13.3						
Uncollectible revenues.....	51,117					16,121					25,023									
Operating income.....	92,079,548	399	395	1.1		37,173,794	628	720	12.8		41,633,260	323	271	19.0						
Operating ratio—per cent—																				
1917.....		69.0		72.4					68.8					65.4						
1916.....		65.6		66.0					65.1					63.3						
Average mileage represented—																				
1917.....		230,905		59,212					42,738					138,955						
1916.....		230,491		59,228					42,540					128,723						

d Decrease. * Less than one dollar.

per cent; taxes increased 17.6 per cent. Operating income per mile decreased 12.8 per cent.

For the railways of the southern district, operating revenues per mile exceeded those for May, 1916, by 15.5 per cent; operating expenses rose 22.1 per cent; net operating revenue increased 3.2 per cent; taxes increased 36.7 per cent. Operating income per mile decreased 1.1 per cent.

For the western railways, operating revenues per mile exceeded those for May, 1916, by 18.4 per cent; operating expenses rose 18.5 per cent; net operating revenue increased 18.2 per cent; taxes increased 13.3 per cent. Operating income per mile increased 19.0 per cent.

The five months of the current calendar year, compared with the corresponding period of the preceding year, show changes per mile of line as follows: Operating revenues increased 10.5 per cent, operating expenses increased 17.3 per cent, net operating revenue decreased 3.9 per cent, taxes increased 15.3 per cent, while operating income decreased 7.1 per cent.

Operating income per mile decreased 24.3 per cent in the east, increased 2.7 per cent in the south, and increased 8.9 per cent in the west.

May net operating income per mile was 1.1 per cent greater in 1917 than in 1916, 53.9 per cent greater than in 1915, 104.1 per cent greater than in 1914, and 46.1 per cent greater than in 1913.

Local Committees of Commission on Car Service

As previously announced in the *Railway Age Gazette*, local committees of railroad officers have been organized at various points in the country to assist the Commission on Car Service in expediting the movement of equipment. The names of the cities where committees are located and the chairmen in charge are as follows:

Atlanta, Ga., E. W. Sandwich, superintendent of car service, Atlanta & West Point.
Birmingham, Ala., H. E. Hutchens, inspector of passenger transportation of the Southern Railway.
Boston, Mass., S. E. Miller, acting superintendent of transportation, Boston & Maine.
Buffalo, N. Y., D. B. Fleming, superintendent, New York Central.
Chicago, Ill., H. E. Byram, vice-president, Chicago, Burlington & Quincy.
Cleveland, Ohio, R. K. Rochester, superintendent, Pennsylvania Lines West.
Cincinnati, Ohio, Geo. B. Skeldon, Cleveland, Cincinnati, Chicago & St. Louis.
Columbus, Ohio, I. W. Geer, general superintendent Pennsylvania Lines West.
Detroit, Mich., Henry Shearer, general superintendent, Michigan Central.
Galveston, Tex., J. H. Keefe, assistant general manager, Gulf, Colorado & Santa Fe.
Indianapolis, Ind., J. W. Conely, superintendent, Pennsylvania Lines West.
Kansas City, Mo., O. C. Hill, superintendent, Kansas City Terminal.
Louisville, Ky., W. S. Campbell, manager and chief engineer, Kentucky & Indiana Terminal.
Memphis, Tenn., A. H. Egan, general superintendent, Illinois Central.
Minneapolis, Minn., G. T. Slade, vice-president, Northern Pacific.
Norfolk, Va., C. P. Dugan, superintendent of transportation, Norfolk Southern.
New York, N. Y., F. E. Williamson, superintendent, New York Central.
New Orleans, La., L. A. Downs, general superintendent, Illinois Central.
Philadelphia, Pa., Elisha Lee, general manager, Pennsylvania Railroad.
Pittsburgh, Pa., D. F. Crawford, general manager, Pennsylvania Lines.
Peoria, Ill., R. H. Johnson, general manager, Peoria & Pekin Union.
Richmond, Va., W. D. Duke, general superintendent, Richmond, F. & P.
St. Louis, Mo., I. L. Burlingame, general manager, Terminal Railroad Association.
Seattle, Wash., J. H. O'Neill, general superintendent, Great Northern.
San Francisco, Cal., K. M. Nicoles, superintendent of transportation and superintendent of telegraph, Western Pacific.
Toledo, Ohio, A. B. Newell, president, Toledo Terminal.
Wheeler, W. Va., U. B. Williams, general agent, Baltimore & Ohio.

Railroad Efficiency in Serving Army Camps

In a statement given out on July 25, R. H. Aishton, chairman of the Central Department Committee of the Railroads' War Board, shows how efficiently the railroads are serving the army camps in the 15 states in the Central War Department. There are six cantonment sites, four aviation sites and 21 mobilization and training camps in this district, and at every one of these places, most of which were established after the war began, there has been a strenuous demand for large quantities of a wide variety of material and supplies. In order to reach some of the new military sites it was necessary for the railroads to build miles of track before they could deliver material for the buildings planned. Nevertheless, the records show that up to July 20, 2,298 carloads of materials and supplies had been delivered to the cantonment sites, 3,092 carloads at the aviation sites, and 900 at the mobilization and training camps, or a total of 6,300 carloads. Among the sites where new track has been necessary are Rockford, Ill., where a length of 4.5 miles of track

was built and 2 miles more are being built. Battle Creek, Mich., 1 mile built; Rantoul, Ill., ½ mile built. To ascertain exactly how the railroads were meeting the demands of the war department at these sites, Mr. Aishton sent specific inquiries to each of the military sites, and in every case received the assurance that no complaint could be made as to the furnishing of cars or the moving of material.

Railway and Engineering Work in France

The value of railroad materials and rolling stock alone, now being purchased to provide in advance for the needs of the American army abroad, is about five times that of all purchases made annually in this country for the Panama Canal during the last four or five years, according to a statement authorized by the chief of engineers of the army.

American engineers must undertake large operations in the construction and repair of bridges in France. They must repair and maintain the roads and highways over which supplies will be brought up to the battle line. Much of the latter work will be done within range of the enemy's guns.

Our engineers will equip the wharves and piers in France utilized by American forces with the terminal facilities required by our armies. The lumber for this work will be cut from European forests by regiments of American foresters. This method will save burdening our ships with lumber from the United States. One regiment of foresters is being organized, and several more will be raised. They will carry with them complete lumbermen's outfits, including sawmill equipment.

Material for extensive standard gage and narrow gage railroads will be sent to Europe, to enable the engineers to carry out their task. The lines to be built will both transport our troops to the front and handle all transportation behind the firing line. The lines running up to the front will remove wounded and salvage gathered from the field. Lines of this type are broad-gage, feeding numerous narrow-gage spurs which radiate from the main line and accommodate supply trains, often hauled by gasoline engines.

The Engineers' Corps will carry its own rolling stock to the theater of war. This, in itself, will be a gigantic operation.

The engineers must construct at harbors in the United States wharves, piers and storehouses of sufficient capacity to handle all materials and supplies to be shipped to France. An efficiency system has been worked out to provide against delay in loading and unloading which might interfere in any way with the maximum movement of the shipping available. Ample and up-to-date terminal facilities must be provided in ports on both sides of the Atlantic. Our shortage of ships on the water makes efficiency in docks doubly important, and the speed of the transport service naturally depends upon the number of tons actually moving all the time, and not upon the amount of tonnage available.

U. S. Chamber of Commerce Urges Development of Storage Facilities

A committee of the Chamber of Commerce of the United States has issued a bulletin calling attention to ways in which shippers may promote the most efficient use of railway facilities during the war, and urging the importance of developing storage facilities at points of production to avoid congestion in manufacture, of developing such facilities for finished goods near the point of consumption or shipment abroad in order to minimize the need for railroad cars, and of creating conditions under which railroad cars will not be used for storage purposes. The bulletin describes some of the work of the Storage Committee of the Council of National Defense along these lines.

"Unless adequate preparations are made to store materials or goods on the arrival of railroad cars," the bulletin says, "these cars themselves must of necessity be used for storage purposes. Ocean transportation at best is irregular, and today the conditions are uncertain, to say the least. Often in the past two years shipments for France and England have so accumulated at New York and other ports that many hundreds of cars for months have not only blocked terminal facilities but side tracks all the way to Buffalo and Pittsburgh. The work of the Storage Committee is directed toward avoiding this condition on the enormous shipments to be made by our government."

According to the National Chamber bulletin prepared under

the direction of Waddill Catchings, of New York, baling or compressing products for shipment is developing great possibilities for saving transportation space. Already socks and blankets are being baled and satisfactory progress is being made toward baling uniforms, shoes and even prunes. Bales are covered with a waterproof material, which is later used for sand bags at the front. One advantage of baling is that use can be made of flat cars in shipping merchandise.

"The railroads are doing more than ever before, but the burden is overwhelming, for business in this country is on a scale never before approached," according to the National Chamber bulletin. "On the one hand, the supply of new equipment is restricted by material and labor conditions, and on the other hand, not only is existing equipment being given to our Allies, but the output of many of our car and locomotive plants is given to them because their need is greater than ours. Therefore, with little opportunity of securing new equipment and having to rely upon what they have, using this to the utmost until it wears out, the railroads are called upon for increasingly great efforts as our business everywhere expands.

"The utmost which the railroads are able to do is not equal to the needs of the government and of the great business being done today. In fact, it is said, facilities of transportation are very likely to be the limiting factor on general business unless there is close co-operation between business men and the railroads. Business men will see, therefore, how deep is their concern that no avoidable demand be made upon the railroads either for transportation or for the use of railroad cars for storage purposes.

"The request is made therefore of all member associations of the Chamber of Commerce of the United States interested in this problem to appoint competent and energetic committees to act in this connection, and to send the names of the members of such committees to the committee of which Mr. Catchings is the chairman, and to the Storage Committee of the Council of National Defense at Washington.

"Furthermore, steps should be taken to eliminate less than carload shipment by combining such shipments for many manufacturers in a locality, and by establishing centers for distributing, by truck, shipments received in car lots and for receiving goods in a similar manner for outbound movement in car lots. Effort should also be made to bring about the loading of railroad cars to full car capacity. Where such loading is prevented by trade customs, which establish the unit of an order at less than maximum car capacity, steps should be taken to change these customs so that the use of cars will not be unduly restricted."

Bridge and Building Convention

At a meeting of the executive committee of the American Railway Bridge and Building Association, held in Chicago on July 25, it was decided to transfer the next convention from St. Paul, the place originally selected, to Chicago, to enable more men to attend the meeting with a minimum loss of time. It was also decided to hold a three-day convention and to revise the program radically to enable a large part of the time to be given to the consideration of problems which have assumed primary importance for bridge and building men during the last few months. Special attention will be given to discussions of labor and of materials.

National Association of Purchasing Agents

The annual congress of purchasing agents, under the auspices of the national association, will be held at Pittsburgh, October 9, 10 and 11. The program includes business sessions for the mornings and visitation and inspection of industrial works during the afternoons.

The National Association of Purchasing Agents is composed of the membership of local branches with a present total membership, including all active local associations, of more than 1,000.

The object of the association is to bring together on common ground purchasing agents generally, to gather and to disseminate information and knowledge of benefit to the profession, to foster and promote friendly relations between members, to secure more uniform purchasing routine method and the standardization of specifications and classifications and dissemination

of data relating to the general subject of buying, the improvement of existing methods for the diffusion of information, and to secure generally more definite as well as broader information on topics and problems of importance.

The president of the association is E. L. McGrew, of the Standard Underground Cable Company. The headquarters are at 600 Westinghouse building, Pittsburgh.

MEETINGS AND CONVENTIONS

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

- AIR BRAKE ASSOCIATION.—F. M. Nellis, Room 3014, 165 Broadway, New York City.
- AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Portions, 455 Grand Central Station, Chicago. Next meeting, July 18, 1917, Asheville, N. C.
- AMERICAN ASSOCIATION OF DINING CAR SUPERINTENDENTS.—H. C. Boardman, 12 L. & W., Hoboken, N. J. Next convention, October, 1917, San Francisco, Cal.
- AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, Illinois Central, Chicago, Ill.
- AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Next meeting, October 16-17, N. Y.
- AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Harman, Room 101, Union Station, St. Louis, Mo. Annual meeting to have been held August 8-10 indefinitely postponed.
- AMERICAN ELECTRIC RAILWAY ASSOCIATION.—E. B. Barritt, 8 W. 40th St., New York. Convention for 1917 abandoned.
- AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOCIATION.—Fred C. J. Dell, 165 Broadway, New York.
- AMERICAN RAILROAD MASTER TINNERS', COPPERSMITHS' AND PIPEFITTERS' ASSOCIATION.—W. E. Jones, C. & N. W., 3814 Fulton St., Chicago. Convention for 1917 postponed.
- AMERICAN RAILWAY ASSOCIATION.—J. E. Fairbanks, general secretary, 75 Church St., New York.
- AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichy, C. & N. W., Chicago. Next convention, October 16-18, 1917, St. Paul, Minn.
- AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago.
- AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, 1112 Karpen Bldg., Chicago.
- AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—Owen D. Kinsey, Illinois Central, Chicago. Next convention, to have been held August 30-September 1, Hotel Sherman, Chicago, postponed for one year.
- AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.
- AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.
- AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 49th St., New York.
- AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January, 1918, Chicago.
- ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—E. R. Woodson, Rooms 1116-8 Woodward Bldg., Washington, D. C.
- ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS.—George W. Lyndon, 124 McCormick Bldg., Chicago. Semi-annual meeting with Master Car Builders' Association.
- ASSOCIATION OF RAILWAY CLAIM AGENTS.—Willis H. Failing, Terminal Station, Central of New Jersey, Jersey City, N. J.
- ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucciti, C. & N. W., Room 411, C. & N. W. Sta., Chicago. Semi-annual and annual convention postponed indefinitely.
- ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—W. L. Connelly, Superintendent Telegraph, Indiana Harbor, Belt, Gibson, Ind. Next annual meeting, September 11-13, 1917, Washington, D. C.
- ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 75 Church St., New York.
- BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—Tom Lebon, The Lebon Company, Chicago. Meetings with American Railway Bridge and Building Association.
- CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.
- CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal Que. Regular meetings, 1st Thursday in October, November, December, February, March and April, annual meeting, January, Montreal.
- CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.
- CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.
- CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—W. R. McMuun, New York Central, Albany, N. Y. Next convention, September, 1917, St. Louis.
- ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 568 Union Arcade Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.
- FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Traffic Manager, R. F. & P., Richmond, Va.
- GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1356, Transportation Bldg., Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, C. H. & D. L. Line, Ohio. Next annual meeting, to have been held August 21-23, 1917, Chicago, postponed for one year.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—J. G. Crawford, C. B. & Q. R. R., 702 E. 51st St., Chicago. Next convention, May, 1918, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1126 W. Broadway, Winona, Minn. Annual meeting, to have been held September 4-7, 1917, Hotel Sherman, Chicago, indefinitely postponed.

INVESTMENT BANKERS' ASSOCIATION OF AMERICA.—Frederick R. Fenton, 11 W. Monroe St., Chicago. Annual convention, October 1-3, 1917, Baltimore, Md.

MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 16-18, 1917, Cleveland, Ohio.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—A. P. Dafe, B. & M., Reading, Mass. Next annual meeting, September 11, 1917, Chicago.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, 1112 Karpen Bldg., Chicago.

NATIONAL ASSOCIATION OF RAILWAY COMMISSIONERS.—Jas. B. Walker, 120 Broadway, New York City. Next annual convention, October 16, 1917, Washington, D. C.

NATIONAL RAILWAY APPLIANCE ASSOCIATION.—C. W. Kelly, 349 Peoples Gas Bldg., Chicago.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 693 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meetings, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Geo. A. J. Hochgrebe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PACIFIC RAILWAY CLUB.—W. S. Wollner, Assistant to Chief Engineer, Northwestern Pacific R. R., San Francisco, Cal.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 30 Church St., New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial-Annex Hotel, Pittsburgh.

RAILWAY DEVELOPMENT ASSOCIATION.—D. C. Welty, Commissioner of Agriculture, St. L., Iron Mt. & So., 1047 Railway Exchange Bldg., St. Louis. Next annual convention, May, 1918, Houston, Tex.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—J. Scribner, 1063 Maindack Block, Chicago. Meetings with Association of Railway Electrical Engineers.

RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, Office of the President's Assistant, Seaboard Air Line, Norfolk, Va. Next meeting, October 2-4, 1917, St. Louis, Mo.

RAILWAY REAL ESTATE ASSOCIATION.—R. H. Morrison, Assistant Engineer, C. & O., Richmond, Va. Next convention, October, 1917, Duluth, Minn.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next meeting, June, 1917, Hotel McAlpin, N. Y. Next annual convention, September, 1917, Atlantic City, N. J.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, N. Y. C. R. R., Box C, Collinwood, Ohio.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 2136 Oliver Bldg., Pittsburgh, Pa. Meetings with Master Car Builders' and Master Mechanic's Association.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 50 Church St., New York. Meetings with Association of Railway Telegraph Superintendents.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September 18-21, 1917, Hotel Auditorium, Chicago.

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

SALT LAKE TRANSPORTATION CLUB.—R. E. Rowland, David Keith Bldg., Salt Lake City, Utah. Regular meetings, 1st Saturday of each month, Salt Lake City.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—L. W. Cox, N. & W., Philadelphia, Pa.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. R. R., Atlanta, Ga.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.

TOLEDO TRANSPORTATION CLUB.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Roddy House, Toledo.

TRACK SUPPLY ASSOCIATION.—V. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAIN DISPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7122 Stewart Ave., Chicago.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio. Next convention, September, 1917, Chicago.

WESTERN ASSOCIATION OF SHORT LINE RAILROADS.—Clarence M. Oddie, Mills Bldg., San Francisco.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

Traffic News

The Secretary of Commerce has appointed Walter Parker, assistant for Inland Water Transportation. Mr. Parker is general manager of the New Orleans Association of Commerce.

The Kansas Public Utilities Commission rendered a decision on July 20, denying the application of the railroads for an increase in intrastate passenger fares from two to three cents a mile.

The Nebraska State Railway Commission recently granted the railroads of that state a postponement of the date of hearing their application for a 15 per cent increase in freight rates from July 16 to September 10.

An application by the Texas & Pacific to the Railroad Commission of Louisiana for permission to discontinue several local trains, was denied in a decision rendered on July 19, on the ground that local passenger train service in Louisiana is already at the minimum.

The railroads centering in Youngstown, Ohio, in accordance with an agreement with the Chamber of Commerce of that city, have arranged to issue daily bulletins showing embargoes in force on less than carload freight; the purpose being to show, day by day, all changes of importance which may be of interest to Youngstown shippers.

The Baltimore & Ohio is circulating among shippers a number of photographs of cars loaded below their carrying capacity. A statement announcing this policy says that one large shipper on the B. & O. lines could have increased the market output of his plants in one month by 100 carloads if sufficient care had been given to loading cars to their full capacity.

The Santa Fe Lines have arranged to finance the purchase of seed wheat for the coming season for farmers who have located on new lines of the system in southwestern Kansas, northwestern Texas and western Oklahoma. The railroad has deposited approximately \$250,000 with bankers in this region, who will lend the money to the farmers on notes due after the 1918 harvest.

Representatives of railroads and industrial organizations discussed methods of increasing transportation efficiency at a meeting held under the auspices of the Traffic Club of the Chamber of Commerce at Cincinnati, Ohio, on July 20. Hugh M. Freer, chairman of the Traffic Club, was toastmaster, and the speakers included J. A. Morris, superintendent of terminals of the Cleveland, Cincinnati, Chicago & St. Louis, Cincinnati; W. C. Cooder, secretary of the Cincinnati committee of the Commission on Car Service; C. B. Stafford, manager of the traffic department of the Louisville (Ky.) Board of Trade, and Guy M. Freer, president of the National Industrial Traffic League. The latter stated that the transportation situation would be very critical next winter, and that it was the duty of the shippers and consignees to assist the railroads in reducing the shortage of cars by heavy loading and quick unloading.

"Hooverian Principles"

The Baltimore & Ohio announces that "Hooverian principles" of food conservation are to be adopted in its dining car menus, to enable the traveling public to economize as advised by the food administration. The menus have been arranged so as to suggest a liberal use of fish and vegetables, as well as the purchase of meals in quantities sufficient to appease hunger, and the substitution of corn bread for white bread. Unless especially ordered for dietary reasons white bread will not be offered at the morning or mid-day meals. The Baltimore & Ohio will continue to serve cream and butter at meals without extra charge, although it may be found necessary to adopt these suggestions later. Fruits and sweet entrees which do not require the use of pastry will also be featured. The size of portions will remain the same. All such articles as veal, squabs and other unmaturing foods have been discontinued. The service of table d'hôte meals will also be discontinued.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The Interstate Commerce Commission has suspended from August 1 until November 29 the operation of a Southern Pacific Company-Atlantic Steamship Lines tariff providing for increased rates on cotton and cotton products from New Orleans to New York.

Southern Pacific Company's Ownership of Atlantic Steamship Lines

Opinion by Commissioner Meyer:

The petitioner, having corrected the objectionable practices enumerated in the commission's original report, it finds that the existing service of the Southern Pacific Company-Atlantic steamship lines between New York and New Orleans and New York and Galveston is in the interest of the public and of advantage to the convenience and commerce of the people. (45 I. C. C., 505.)

The Car Peddling Case

Nebraska State Grange et al. v. Union Pacific et al. Opinion by Commissioner Harlan:

During the fall of 1915 certain carriers operating in the Middle West took steps to put an end to the peddling or re-tailing of fruits, vegetables and other commodities from cars in railroad yards.

The commission holds that the view that the use by a shipper of a car on the carrier's tracks at destination as a place for peddling or vending to the public the carload shipment arriving in it as a service of transportation has no sanction at common law or in the act to regulate commerce; and the mere toleration by certain carriers through a period of years of such a use of their property affords no basis for a ruling that the practice has grown into a shipper's right and a carrier's duty.

Tariff items providing free time for unloading and demurrage charges for a further detention of a car for that purpose, do not embrace the use of the carrier's equipment and station grounds as a place where the carload shipper may transact business with the public for his own profit.

The business of a carrier is transportation, and its property may not be subjected against its will to a use not connected with transportation.

Discrimination in according or withholding a car-peddling privilege is condemned, but a distinction is made between car peddling and consolidated shipments to agents of granges and other farmer organizations. (45 I. C. C., 494.)

Milk and Cream Investigation

Milk and Cream Rates to Philadelphia. Opinion by Commissioner McChord:

Rates for the interstate transportation of milk, cream, condensed milk, skimmed milk, buttermilk and pot cheese to Philadelphia, Atlantic City and Cape May, N. J., and points on the New Jersey seacoast between the two latter points from points on the lines of the Pennsylvania Railroad, the Philadelphia, Baltimore & Washington, and the West Jersey & Seashore, and to Philadelphia from points in New Jersey on the Philadelphia & Reading, and from points on the Baltimore & Ohio are found to be unreasonable and prejudicial to producers and shippers from near-by points and preferential to producers and shippers from distant points. Reasonable maximum and non-prejudicial rates are prescribed for the future.

The milk and cream supply of Philadelphia is procured in New Jersey, New York, Delaware, Maryland and Pennsylvania, a large part being produced at points within 100 miles of the city and moving over intrastate routes.

The transportation of milk and cream to Philadelphia has developed from an adjunct of the passenger business. Originally milk and cream were transported in baggage cars in passenger trains. On the Pennsylvania the movement of milk in milk cars in passenger trains has been succeeded by a movement in milk trains, excepting cars brought from branch-line points

in passenger trains and later consolidated into milk trains, and occasional movements to Philadelphia in passenger trains. The volume of the latter traffic on the Pennsylvania is small.

During 1915 the amount of milk and cream transported to Philadelphia by the Pennsylvania was 93,675,462 quarts, by the Philadelphia & Reading, 53,938,435 quarts; and by the Baltimore & Ohio, 11,907,916 quarts. During that year electric lines transported 7,115,605 quarts; express companies, 6,991,480 quarts; and wagons and trucks, 4,800,000 quarts. The total receipts of 178,000,000 quarts compared with 120,000,000 in 1905 and 78,000,000 in 1887.

Milk and cream are sold to Philadelphia dealers on two bases. Under one basis the farmers sell the milk at a price delivered in Philadelphia. The farmers own the cans, clean them, tender the loaded cans at a milk platform owned by the carrier, and pay the transportation charges. The farmers do not own or operate milk-receiving stations. The farmers ship two-thirds of the milk and cream shipments over the Philadelphia & Reading, one-sixth of those over the Baltimore & Ohio, and some of those over the Pennsylvania. Until recent years substantially all shipments to Philadelphia were forwarded by farmers. Under the other basis Philadelphia dealers establish receiving stations at various points and install machinery for cooling the products and cleaning the cans. At a few points receiving stations are operated by independent companies which ship to dealers, the latter paying the transportation charges.

The Pennsylvania and Baltimore & Ohio have milk departments in charge of the milk business. Employees of these departments accompany cars to receive shipments, distribute the empty cans, and attend to billing and checking. The Reading has no separate milk department, but contracts with a dairy company to which it pays 20 per cent of its gross receipts on shipments secured from that company.

The Pennsylvania publishes rates on a zone system, the rates ranging from 20 cents for L. C. L. and 17.4 cents C. L. for 40-quart cans moving from 1 to 30 miles to 36.8 L. C. L. and 31.9 C. L. from 501 miles or more. The L. C. L. rates include icing, and rates include the return of the empty containers. Carload shipments are iced by dealers.

The Pennsylvania presented a careful analysis of the costs of handling this traffic, whereby it was shown that the actual earnings for the year from milk and cream traffic on the Philadelphia division were \$207,455. The expense on account of this traffic, as shown by the above table, was \$182,525, leaving a net revenue of \$24,930, or an operating ratio of 87.98 per cent. The figures do not include taxes. The operating ratio so ascertained for the milk traffic is compared with operating ratio of 76.67 per cent for the year 1914 for all traffic on the Pennsylvania Railroad, and on all traffic on the Philadelphia division for the same period of 72.06 per cent.

From the facts of record the commission is unable to find that the revenue received by the Pennsylvania from the rates on shipments of milk and cream to Philadelphia and the other points involved is unreasonably high.

It finds, however, that the present zone adjustment is unreasonable and prejudicial to producers and shippers from near-by points, and unduly prefers producers and shippers from distant points.

It establishes new L. C. L. rates for milk moving over the Pennsylvania, the Philadelphia, Baltimore & Washington and the West Jersey & Seashore to Philadelphia, Atlantic City and Cape May, and points on the New Jersey coast between the two last named points, in baggage, milk or refrigerator cars, in milk or passenger trains, iced when necessary, such rates to include the return of the empty containers. These rates are for 40-quart cans, and are based on a mileage scale with 10-mile divisions, ranging from 15.5 for 10 miles or under to 35.5 at 300 miles, and 48.5 to over 620, but not over 630. Rates for 20-quart and other cans are to be based on these on prescribed percentages. It is further found that the rates on cream and condensed milk should not exceed those on milk by more than 25 per cent. Carload rates may not exceed 87½ per cent of the less-than-carload rates.

Similar findings are made as to the rates on the Reading and Baltimore & Ohio. (45 I. C. C., 37.)

Ida S. Graustein v. Boston & Maine et al. Opinion by Commissioner McChord:

Reparation of \$30,519 is awarded for violations of the pro-

visions of the act by the Boston & Maine and the Rutland with respect to rates charged, train service and equipment furnished for transportation of milk in carloads from points in Vermont to Boston, Mass. (45 I. C. C., 393.)

Milk and Cream Rates to New York City. Opinion by Commissioner McChord:

Rates for the interstate transportation of milk, cream, condensed milk, skim milk, buttermilk, and pot cheese, in carloads and less than carloads, to Weehawken, Hoboken, and Jersey City, N. J., and New York, N. Y., from points on lines of respondents are found to be unreasonable and prejudicial to producers and shippers from near-by points and preferential to producers and shippers from distant points, and reasonable and non-prejudicial basis of rates prescribed for the future.

The rates prescribed are the same as those in the case above, *Milk and Cream Rates to Philadelphia*.

New York City secures the greater part of its milk from the eastern and central part of the state of New York, from points on and east of the line of the Pennsylvania Railroad extending from Sodus Point to Elmira, N. Y. Some is secured from western New York, northern Pennsylvania and New Jersey, Vermont, and western Massachusetts and Connecticut. All milk originating on the New York Central and on the West Shore west of Albany, N. Y., practically all on the Delaware & Hudson, the New York, Susquehanna & Western, and some on the Rutland and the Central New England, aggregating about 30 per cent of the total, is transported over intrastate routes.

Milk and cream are transported to the New Jersey terminals and to New York City almost wholly in milk cars in milk trains. Some cars are hauled in passenger trains in pick-up service on branch lines. There is practically no movement in baggage cars except some cream by express, which is negligible in quantity. There is no movement in freight trains. The 40-quart can is the standard container on shipments to New York. Rates on 40-quart cans, in less than carloads, are the basic rates in relation to which other rates have been made.

The receipts, reduced to a basis of 40-quart cans, in 1915 were as follows:

Carrier	Delivering point	Number of cans	Percent of total
New York Central.....	Meat House Junction, Bronx; 130th street, Manhattan;		
	33d street, Manhattan.....	6,700,934	33.3
West Shore	Weehawken, N. J.....	884,613	4.4
Total N. Y. C. lines.....		7,585,547	37.7
Erie	Jersey City, N. J.....	2,922,888	14.5
N. Y., S. & W.....	Jersey City, N. J.....	574,565	2.8
Total Erie lines.....		3,497,453	17.3
D. L. & W.....	Hoboken, N. J.....	3,176,246	15.8
N. Y., O. & W.....	Weehawken, N. J.....	2,511,754	12.5
Lehigh Valley	Jersey City, N. J.....	2,123,704	10.5
Pennsylvania	Jersey City, N. J.; Flatbush avenue, Brooklyn	471,458	2.3
N. Y., N. H. & H.....	Harlem River, Bronx	334,165	2.1
Total rail carriers.....		19,700,327	98.2
Other sources		365,000	1.8
Total		20,065,327	100.0

A large proportion of milk and cream shipped to New York is received at stations owned by dealers. The respondents operate trains so as to deliver milk and cream in time for dealers to prepare shipments for morning delivery, the trains generally arriving between 9 p. m. and 1 a. m. Each carrier has one or more terminals for the use of its milk traffic. The Pennsylvania delivers milk at Jersey City and Brooklyn, N. Y., a higher charge being collected for deliveries to the latter point. At each of the terminals a force of men is specially employed to unload the milk and load the empty containers. With each milk train there are sufficient employees to load and ice the cars and unload empty containers.

In 1897 the larger part of milk and cream consumed in New York City was produced in the first and second zones, within 100 miles of New York City. At the present time much of the milk shipped to New York is transported more than 400 miles. During the first week in June and in December, 1915, shipments from points on the New York Central to New York City moved from the following zones: First zone, 1 to 40 miles, none; second zone, 41 to 100 miles, 6,336 quarts; third zone, 101 to 190 miles, 44,636 quarts; fourth zone, but not more than 325 miles from the terminals, 520,280 quarts; fourth zone, from

points 325 to 400 miles distant, 153,482 quarts; and fourth zone, from points more than 400 miles distant, 786,158 quarts. The dealers testified that in the future the supply would be drawn from greater and greater distances.

The commission, as in the Philadelphia case, finds that on the whole the rates are not unreasonable. The present rates are on a zone system established as a result of the commission's findings in 1897. The commission notes conditions have changed materially since that decision was rendered, especially as to the increased distance from which the supply is obtained. It accordingly, as in the other case, holds that the present rates are prejudicial against shippers from the nearer points, and orders a readjustment, as above noted. (45 I. C. C., 412.)

Bituminous Coal to Central Freight Association Territory

Opinion by the commission:

These cases, consolidated for hearing, involve: (1) the reasonableness and non-discriminatory character of rates on bituminous coal from the Ohio mining districts to that portion of central freight association territory which is described and delimited in the report as "affected" territory; (2) the reasonableness and non-discriminatory character of rates from the Ohio mining districts and from districts in Pennsylvania, Maryland, West Virginia, Virginia, Kentucky, and Tennessee, collectively referred to in the report as the "Crescent," to certain interior cities in Michigan; (3) the propriety and reasonableness of increased rates proposed to be made effective from the Crescent to affected territory; (4) the proper relation of the rates, or the measure of the differential, to be observed between the rates from the Ohio and "inner Crescent" districts to affected territory; (5) the proper relation of rates, or the measure of the differential, to be observed between the rates from the Connellsville district in Pennsylvania and the Pittsburgh and other competitive districts in Pennsylvania; (6) the question whether or not the rates from the Pocahontas district in West Virginia to Canton, Ohio, should be the same as to Cleveland, Ohio.

In a comprehensive sense the origin territory from which rates on bituminous coal are here involved comprises (1) all mining districts in the state of Ohio; (2) the districts in an extensive zone embracing substantially all that portion of the Appalachian coal-producing region that extends from western Pennsylvania through Maryland, West Virginia, southwestern Virginia, and into eastern Kentucky and Tennessee. This part of the Appalachian zone is shaped, in its geographical configuration, somewhat like a crescent, presenting toward the Ohio districts and central freight association territory its concave side. Because of this geographical feature, the districts within the zone arc, collectively, and, in the parlance of transportation and the coal trade, commonly referred to as the "Crescent."

The rates from all this territory are made upon the group principle. Differences in the rates from the various districts depend upon fixed differentials. The various individual mining districts in the Crescent from which increased rates are proposed may be classified in two general groups: (1) Certain districts forming the inner or concave side of the Crescent, hereinafter referred to as the "inner Crescent," which take a differential over the Ohio districts to all destination territory here involved, of 25 cents per ton, uniformly; (2) certain other districts from which the rates are higher by fixed differentials than from the inner Crescent. The districts comprising the inner Crescent lie nearest to the destination territory and to the westward of the second group of individual districts which constitute an outer and parallel chain of mining districts that may for purpose of distinction be called the "outer Crescent." From the latter the rates, present and proposed, are differentially higher than from the inner crescent by from 10 to 20 cents per ton. (The term "present rates" refers to the rates complained of and those in effect during the pendency of the proceedings and at the time the cases were submitted upon argument, and not to the rates which by reason of uniform increases in all coal rates have become effective since June 30, 1917.) Midway between the Pittsburgh and the Meyersdale districts in the inner and outer Crescents, respectively, lies the Connellsville district from which the rate westbound is in nearly all instances 15 cents higher than from the Pittsburgh district.

The principal district designations in the inner Crescent group are the Pittsburgh district in western Pennsylvania; the Fair-

mont and Kanawha districts in West Virginia; the Kenova-Thacker district lying partly in West Virginia and partly in Kentucky; the Elkhorn district in eastern Kentucky; and the Jellico district lying in eastern Kentucky and eastern Tennessee. The principal district designations in the outer Crescent are the Meyersdale district in Pennsylvania, the Cumberland-Piedmont district in Maryland and West Virginia, the Coal & Coke Railway, New River and Pocahontas districts in West Virginia, the Clinch Valley district in Virginia, and the Stonega district which lies in the pocket of southwestern Virginia and eastern Kentucky.

The Ohio origin districts are the Hocking, Jackson, Pomeroy and Cambridge in southeastern Ohio; the No. 8 district in eastern Ohio lying just west of the Pittsburgh district of Pennsylvania; and the Middle, or Goshen, and Massillon districts in the northeastern quarter of Ohio. The Middle and Massillon districts are of minor importance, because the volume of coal shipped is insignificant, relatively, and the rates therefrom are always made differentially lower than the general scale from the other Ohio districts.

There are numerous subdivisions of the before-mentioned individual districts.

The territory to which the proposed rates apply is that portion of central freight association territory embraced in the northwestern quarter of Ohio; the northeastern quarter of Indiana; and the entire lower peninsula of Michigan. The territory thus limited is referred to as the "affected" territory in distinction from the nonaffected territory, so called, which comprises that portion of central freight association territory to which no increased rates are proposed in the tariffs here under suspension.

The commission's findings are as follows:

GENERAL.

1. That the rates on bituminous coal from all the territory here involved have long been established upon the group principle and apply from three general rate groups which may be denominated (a) the Ohio group, (b) the so-called inner Crescent group, and (c) the so-called outer Crescent group, which are delimited in the report.

2. That the issues in these cases which appear to affect, directly or indirectly, the general group adjustment, may be resolved, in the final analysis, into questions relating to the measure of differentials or relationship of rates: (a) Between certain of the general groups, e. g., as between the Ohio and inner Crescent group; (b) as between the Connellsville district in Pennsylvania and the Pittsburgh and other competitive districts.

3. That a wider differential between the rates on bituminous coal from the Ohio group and the Crescent groups to that portion of central freight association territory called affected territory than obtains from the same groups to that portion of central freight association territory denominated nonaffected territory, is justified by dissimilar circumstances and conditions.

AS TO OHIO RATES.

1. That the rates under attack from the Ohio group to affected territory are not unreasonable.

2. That the rates from Ohio mines to the interior Michigan cities are not unreasonable in and of themselves, but that the rate of \$1 from Ohio mines to Toledo, Ohio, is, and for the future will be, unduly prejudicial against the interior Michigan cities and unduly preferential of Toledo, Ohio, to the extent and in the amounts specified herein.

3. That the 85-cent rate from the Hocking district to Toledo, Ohio, established since the inception of this proceeding, enhances and intensifies the undue prejudice against the interior Michigan cities that already existed under the \$1 rate to Toledo.

AS TO THE CRESCENT RATES.

1. That the rates from the Crescent groups to affected territory complained of and under investigation in this proceeding are below the level at which maximum reasonable rates might be maintained from the Crescent groups to affected territory.

2. That the rates from the inner and outer Crescent groups to Toledo, Ohio, are unduly prejudicial to the interior Michigan cities and unduly preferential of Toledo, Ohio, to the extent and in the amounts specified.

3. That the proposed rates from the inner and outer Crescent groups to destinations in affected territory have been justified.

4. That the differential of 25 cents per ton between the rates

from the Ohio and inner Crescent districts to affected territory is, and for the future will be, unduly prejudicial to the Ohio districts and unduly preferential of the inner Crescent districts to the extent that the said differential between the said Ohio and inner Crescent districts is less than 40 cents per ton, and that it is, and for the future, will be, unduly prejudicial to the inner Crescent districts and unduly preferential of the Ohio districts to the extent that the said differential is more than 40 cents per ton.

5. That the proposed rates from certain districts in the inner and outer Crescent groups to Columbus, Ohio, have been justified.

AS TO THE CONNELLSVILLE DIFFERENTIAL.

1. That the rates from the Connellsville district to points in Ohio, south of the territory west of the Sandusky-Galion line but substantially equidistant from the Connellsville district as the Sandusky-Galion line, and to all other points in central freight association territory west of the southerly Ohio points aforesaid, and on and west of the Sandusky-Galion line, are, and for the future will be, unduly prejudicial to the Connellsville district to the extent that the said rates from the Connellsville district exceed the rates contemporaneously in effect from the Pittsburgh district.

2. That the rates from the Connellsville district to Youngstown, Ohio, and points taking Youngstown rates, are, and for the future will be, unduly prejudicial to the Connellsville district and unduly preferential of the Pittsburgh district to the extent that the rates from the Connellsville district exceed the rates contemporaneously in effect from the Pittsburgh district by more than 8 cents per short ton.

3. That the rates from the Connellsville district to Cleveland, Ohio, and other points in affected territory in Ohio, east of the Sandusky-Galion line other than points taking Youngstown rates, are, and for the future will be, unduly prejudicial to the Connellsville district and unduly preferential of the Pittsburgh district to the extent that the rates from the Connellsville district exceed the rates from the Pittsburgh district by more than 6 cents per short ton.

AS TO CANTON, OHIO.

That the rates from the Pocahontas district in West Virginia to Canton, Ohio, should not exceed the rates contemporaneously in effect from the Pocahontas district to Cleveland, Ohio, and the proposed rates have been justified.

The respondents will be required to remove the unlawful discriminations found to exist against Ohio and in favor of the inner Crescent districts. They will also be required to remove the undue prejudice against the interior Michigan cities and the undue preference of Toledo. In so far as the unlawful discriminations against the interior cities in Michigan must be removed by reductions in the rates to such cities, the reductions may be made effective on five days' notice to the Interstate Commerce Commission and the general public.

Orders will be entered in accordance with the findings herein. (46 I. C. C. 66)

Lake Cargo Coal Rates

Opinion by the commission:

This proceeding involves the reasonableness and propriety of the rates, rules, regulations, and practices applicable to shipments of bituminous coal in carloads from mines in Pennsylvania, Maryland, West Virginia, Virginia, Kentucky, and Ohio, to Lake Erie ports for transshipment by vessel. The commission holds that

The reasonableness *per se* of the rates can not now be determined because of the abnormal conditions prevailing.

The rate adjustment is found to be unduly preferential and prejudicial; and specific relationships in the rates as between the several originating districts are ordered for the future.

The respondents are required to state separately in their tariffs the charges for the line haul and the dock services, respectively.

The rates considered are those in effect prior to the recent increase of 15 cents per ton.

In one part of the case complaint was made against the reasonableness of the 78 cent rate on lake cargo coal from the Pittsburgh district to Ashtabula via the Pennsylvania and New York Central lines. The complainant asserted that the cost of transporting

lake cargo coal to Ashtabula has been downward since 1911 for the following principal reasons:

- The load per car has increased;
- The number of cars per train and the tons per train have increased;
- The detention of cars at the lake ports is less because of change in the demurrage rules, the result being greater car efficiency.

The carriers, however, also submitted figures showing increases in the costs of equipment, and in costs of operation, whereupon the commission holds that: Considering the increased investment, the increase in wages, and all the other factors affecting the cost of transportation, the conclusion seems to be justified that up to June 30, 1916, there had been but little change since 1911 in the cost per unit of transporting lake cargo coal from the Pittsburgh district or the other districts, but assuming that the cost has been reduced we would not regard it as just and proper to take from the carriers all of the benefits resulting from their increased investments and the introduction of improved methods.

The principal part of the case, however, deals with the rate relationship of the several groups. The rates in issue were as follows:

Originating districts	Rates investigated	Rates now in effect
Ohio No. 8, Hocking, Cambridge.....	75	90
Pittsburgh.....	78	93
Fairmont, Connellsville.....	90	105
Kanawha, Thacker, Kenova.....	97	112
New River, Pocahontas, Cumberland-Piedmont, Meyersdale.....	112	127

As hereinbefore stated, the principal interest of the interveners is in the rate relationship existing as between the several originating districts. Thus, the West Virginia and Kentucky interveners object to any widening of the differential over the rates from the Pittsburgh and the Ohio districts; the Connellsville interveners ask that the Connellsville district be accorded the same rate as the Pittsburgh district; and the Meyersdale district interveners object to being grouped with the New River and Pocahontas districts in southern West Virginia and ask to be grouped instead with the Fairmont and Connellsville districts. The Meyersdale interveners also claim discrimination in their rates as compared with the rates from Fairmont and Connellsville.

The commission after a careful investigation holds that the relationships should be readjusted so that they will be on the following basis:

- Ohio No. 8, Cambridge and Hocking districts, 3 cents under Pittsburgh district.
- Connellsville district, 6 cents over Pittsburgh district.
- Altoona district, 22 cents over Pittsburgh district.
- Fairmont district, 18 cents over Ohio No. 8, Cambridge, and Hocking districts.
- Meyersdale district, 16 cents over Connellsville district.
- Cumberland-Piedmont district, 12 cents over Fairmont district.
- Kanawha, Kenova-Thacker, and Kentucky districts, 28 cents over Ohio No. 8, Cambridge, and Hocking districts.
- New River and Pocahontas districts, 15 cents over Kanawha, Kenova-Thacker, and Kentucky districts.

Because the present rates on cargo coal appear to be regarded both by the shippers and the carriers as being in the nature of emergency rates, made necessary to a large extent by the conditions arising because of the world war, the commission does not attempt to pass upon the reasonableness *per se* of the rates on this traffic.

In the supplemental report in the Iron Ore Rate Cases, 44 I. C. C., 368, the respondents therein were ordered to establish and maintain separate charges for the services performed by them at their ore docks. The situation with respect to lake cargo coal is very similar, except the coal traffic moves in the opposite direction to that of the ore. Since some of the respondents now provide in their tariffs separate charges for the line-haul service and the dock service, respectively, the commission will, in the interest of uniformity, and in order that the shippers of lake cargo coal may know definitely and specifically for what services they are required to pay, and the amount thereof, require that each of the carriers respondent herein owning or operating coal docks at any of the lower Lake Erie ports hereinbefore named state in their tariffs the amount in cents per short ton charged against the lake cargo coal traffic (a) for the line-haul service from the mines to the docks at the lake port, and (b) for the service of transferring the coal from the cars to the vessel at the docks. (46 I. C. C., 159.)

PERSONNEL OF COMMISSIONS

John M. Reifsnider has been appointed a member of the Public Service Commission of Maryland in place of P. D. Laird, resigned.

C. H. Byers has been appointed district engineer of the Division of Valuation, Interstate Commerce Commission, Pacific district; and W. H. Davison is appointed assistant district engineer.

COURT NEWS

Hours of Service Act—Separate Offices

A few hundred feet from a station a railroad company maintained an interlocking tower. An operator worked at the station from 7 a. m. to 7 p. m., when another operator removed the train register and order book to the tower, where all orders and messages pertaining to train movements were received and sent from 7 p. m. until 7 a. m. The Circuit Court of Appeals, Eighth Circuit, holds that the station and tower were not separate offices, but a continuously operated office, within the act, and the statute was violated by keeping such operators on duty longer than is permitted thereby at continuously operated offices.—Illinois Central v. United States, 241 Fed., 667. Decided March 14, 1917.

Workmen's Compensation Act Course of Employment

A yard engine man had turned in his engine about 6 a. m., having completed his work, and had also turned in his slip, showing that his run had been completed. Instead of leaving the yard by one of numerous streets, which he could have used, he walked along the tracks for 1,000 feet, and crossed over another street, and onto an elevated track on its other side, where he was struck and killed by a freight train. His purpose in going on the second track was to catch a passing freight train to ride to a point where he could collect his pay. The New York Appellate Division holds that decedent was not killed in the course of his employment, within the Workmen's Compensation Law.—Ames v. New York Central, 165 N. Y. Supp., 84. Decided May 2, 1917.

Look and Listen Rule in Texas

In a crossing accident case, in which the Texas Court of Civil Appeals reversed a judgment for the plaintiff and rendered judgment for the railroad, because of the contributory negligence of the driver of the automobile, for whose injuries the action was brought, in failing to keep a lookout for a train before driving on the crossing, the court stated the law on the subject as held in Texas to be as follows:

"We agree with the contention of appellees' counsel, to the effect that there is no statute in this state which requires one approaching a railroad crossing to stop, look and listen, or to do either; and we also understand that the appellate courts of this state have never held that a failure on the part of one approaching a railroad crossing to stop, look and listen, or to do either, in order to ascertain whether or not a train might be approaching, would, as a matter of law, constitute contributory negligence. But such is not the point here raised, and which we are discussing.

"We understand it to be the rule in this state that all adult persons, at all times and places, are required to use at least ordinary care for their own protection and safety, and if we correctly interpret the rule as laid down by the Supreme Court of this state in many cases, a person approaching a railroad crossing is required to use ordinary care to ascertain by some means whether a train might be approaching such crossing, with a view of avoiding contact with such train, and if such person about to make such a crossing, by the use of ordinary care in looking for the approach of a train to such crossing, can discover the approach of the train to the crossing in time to avoid contact and injury therewith, and fails to use such care, and the state of the evidence be such that it must follow that such failure must be held to have caused or contributed to the injury sustained, then such person is barred from recovery on the ground of contributory negligence."—St. Louis S. W. v. Harrell (Tex.), 194 S. W., 971. Decided May 9, 1917.

Equipment and Supplies

LOCOMOTIVES

THE TORONTO, HAMILTON & BUFFALO has ordered 6 switching locomotives from the Canadian Locomotive Company.

FREIGHT CARS

THE CHILEAN RAILWAY is inquiring for prices on 400 stock and 600 box cars of 30-ton capacity.

THE YOUNGSTOWN SHEET & TUBE COMPANY has ordered 20 hopper and 20 flat cars from the Pressed Steel Car Company.

THE AMERICAN RAILROAD OF PORTO RICO, through its purchasing agents, the International Supply Company, 30 Church street, New York, is inquiring for 50 20-ton narrow gage flat cars.

UNITED STATES GOVERNMENT. Reports have it that the Government will shortly place orders for about 17,000 cars for service with the forces in France. The cars, it is said, will be four-wheel flat bottom low side gondola cars of 12 metric tons capacity.

IRON AND STEEL

THE UNITED STATES GOVERNMENT is reported as having placed orders for 150,000 tons of rails for use in France.

MACHINERY AND TOOLS

THE DELAWARE, LACKAWANNA & WESTERN is asking bids on a number of machine tools.

THE BALTIMORE & OHIO has ordered 2 26-in. turret lathes for its Newark, Ohio, car shops.

THE UNITED STATES GOVERNMENT is asking for bids on about \$2,000,000 worth of machine tools for use in France, and the Pennsylvania Railroad, acting in behalf of the United States Government, is asking for bids on seven vertical boring and turning mills, two vertical turret lathes, one horizontal boring and drilling machine and a car wheel boring mill, which are required for the use of the regiment of engineers which it recently helped to raise.

TRACK SPECIALTIES

THE WABASH is inquiring for tie plates for 1918 delivery.

THE ANN ARBOR is in the market for 1,500 kegs of spikes for delivery the first half of 1918, and is also inquiring for 300,000 tie plates for delivery in 1917.

MISCELLANEOUS

ILLINOIS CENTRAL.—The road has recently awarded a contract to the Railroad, Water & Coal Handling Company, Chicago, for the construction of a 500-ton coaling station of the automatic bucket type at Lambert, Miss. The structure will have a concrete foundation and timber superstructure. A contract was also awarded to the same company for the construction of a similar station of 300 tons' capacity at Durant, Miss.

BOMBING A TRAIN.—Aeroplanes have descended low enough to bomb trains in motion. During the battle of the Somme, last summer, a train leaving Libercourt was attacked from an altitude of 800 feet near Ostricourt and six bombs were dropped. The engine was hit, became derailed, and two or three front coaches telescoped. A second train, following the first, was also attacked, and the two aviators fired 700 shots at the two trains. Seven aeroplanes immediately joined in the attack and dropped a total of 14 heavy and 34 smaller bombs. Many of the German soldiers were killed and all the machines returned safely.—*New York Tribune*.

Supply Trade News

J. H. Prior, chief engineer of the Illinois Public Utilities Commission, has resigned to open an engineering office in Chicago, Ill.

The Barrett Company, New York, announces the appointment of W. T. Kelley as railroad sales department representative, with headquarters at Pittsburgh, Pa.

The American Steel Export Company has appointed Woodburn's Limited, of Montreal, Canada, as its exclusive agents for the provinces of Ontario and Quebec.

F. P. Huntley, who has been connected with the Gould Coupler Company since its organization, about twenty years ago, has resigned from his position as vice-president and general manager.

William H. Ross has become associated with the Patton Paint Company, Milwaukee, Wis., and will represent the railway sales department as sales engineer, with headquarters at Pittsburgh, Pa.

Howard P. Cook, eastern representative of the Columbia Nut & Bolt Company, Bridgeport, Conn., left July 14 to enter military service with the quartermasters' supply department of the New York National Guard.

F. R. Cooper, formerly superintendent of motive power of the Kansas City Southern, and until recently connected with the Breakless Staybolt Company of Pittsburgh, Pa., has resigned from the latter company to become sales manager of the Gold Car Heating & Lighting Company, with offices at New York.

Jesse Hough, sales representative of the National Lock Washer Company, died at his home in Indianapolis, Ind., on July 23, after a seven months' illness. Mr. Hough had been associated with the National Lock Washer Company since January, 1913, and for 10 years prior to that time was storekeeper in the maintenance of way department of the Indianapolis Traction & Terminal Company.

The Ingersoll-Rand Company announces that at a meeting of the board of directors of the company, on July 25, J. H. Jowett, formerly general sales manager, was elected vice-president of the company, and that L. D. Albin, formerly assistant general sales manager, was appointed general sales manager. Mr. Jowett and Mr. Albin will continue to make the company's new York office, at 11 Broadway, their headquarters.

TRADE PUBLICATIONS

COMPRESSED AIR APPARATUS.—The following new forms have just been issued by the Ingersoll-Rand Company, 11 Broadway, New York: Form 8006, a 20-page catalogue on Imperial motor hoists and stationary motors; form 8212, a four-page bulletin on the Crown coal pick and core breaker; form 8213, a 16-page booklet on "Little David" pneumatic chipping, calking and scaling hammers, and form 9102, an eight-page bulletin on air receivers, pressure tanks and moisture traps. The catalogues are profusely illustrated and show tables of sizes and capacities.

IRON AND STEEL FOR EXPORT.—The English edition of the new 94-page iron and steel catalogue of the American Steel Export Company is now ready for foreign distribution. The Spanish, French, Portuguese, Italian and Russian editions are to be published shortly, now being in process of preparation. This catalogue contains much information, such as weights and measures in English and metric tables, and data covering such products as pig iron, billets, blooms, slabs and sheet cars, plates and shapes, tool steel, merchant bars and agricultural steel, wire products, pipe and tubing, rails and railway supplies, castings and forgings, sheet and tin plate, etc. The object of the catalogue is to inform overseas buyers concerning American sizes, weights, etc. The booklet also includes specifications covering tolerances and other valuable data.

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—This company is contemplating the construction of a terminal at Tulsa, Okla. The plans for this work are as yet in a preliminary stage.

HILLSBORO, CYNTHIANA, BAINBRIDGE & CHILlicothe (ELECTRIC).—This company is contemplating the construction of a road between Hillsboro, Ohio, and Chillicothe, a distance of 42 miles. The right of way for the entire distance has not yet been secured, and construction is not expected to start for some time. J. W. Watts, Hillsboro, is president, and C. F. Clarke is chief engineer.

IBERIA, ST. MARY & EASTERN.—This road has completed plans for the construction of an extension from Shadyside, La., to Patterson, a distance of eight miles. Grading has been started and all material is on the ground. The line is expected to be ready for operation by the early part of November.

MISSOURI PACIFIC.—The contract for grading the four miles of track from the main line of the Central division to the cantonment site near Little Rock, Ark., and for the construction of four additional miles of track on the cantonment grounds, was awarded to J. J. Ball, Little Rock, and the track laying is being done by company forces. (July 27, p. 170.)

NEW YORK, NEW HAVEN & HARTFORD.—Bids have been received by this company, but contracts are not yet awarded for widening the present two-track South Boston cut to accommodate four tracks between South Bay Junction and the Boston freight terminal, a distance of about 2,500 ft.; also for constructing 11 over-head steel bridges. Ten of the bridges will be about 60 ft. long and one 70 ft. long. The improvements also include building a new automatic electrically operated pumping plant.

OREGON SHORT LINE.—This company will build 11 miles of road east of Idaho Falls, Idaho. The construction will be divided into two lines, one from Idaho Falls to a point 4 miles south, and the other from Firth to a point 7 miles north.

PENNSYLVANIA RAILROAD.—This company is building a reinforced concrete bridge to carry two tracks over the new location of Manatawny creek at Pottstown, Pa. The work is being carried out by company forces, and will cost about \$33,437. The course of Manatawny creek will be changed by the Eastern Steel Company to pass under the bridge in its new location.

SOUTHERN PACIFIC.—This company is rehabilitating a portion of one of its car shops at Sacramento, Cal., which was lately injured by fire. The work will cost approximately \$30,000.

SOUTHERN RAILWAY.—A contract has been given to Thomas Worthington, Birmingham, Ala., for the construction of a reinforced concrete viaduct at Twenty-first street, Birmingham, Ala., over the tracks of the Southern Railway System, Seaboard Air Line Railway and Louisville & Nashville. The new structure will be 80 feet wide, and will replace the present structure, which is of wood. It is expected that the work will commence at an early date.

TEXAS & PACIFIC.—This company is contemplating the construction of an eight-stall roundhouse at Texarkana, Tex. The plans, however, are not yet prepared and no definite information can be given for some time.

UNION PACIFIC.—This road will construct a double track line 20 miles long from Manhattan, Kan., to Junction City, for the purpose of improving the transportation facilities to Fort Riley. In addition the company has already put in new stations, freight sidings and enlarged the present facilities at a cost of approximately \$50,000.

WICHITA & WALNUT VALLEY (ELECTRIC).—This company will construct a road from Wichita, Kan., east to Augusta, then north to Eldorado and south from Augusta to Douglas and Winfield, a total distance of about 100 miles. The right of way for the entire distance has not yet been secured, but as soon as it is obtained construction will be started.

Railway Financial News

CHICAGO, MILWAUKEE & ST. PAUL.—The directors have issued a statement of their reasons for reducing the dividend on the common stock from 5 to 4 per cent, in which they say: "The evolution of the transportation industry and the changes in ownership of the railroads of the Northwest rendered it imperative to build to the Pacific Coast. This new line, 3,045 miles, necessitated an expenditure of \$260,000,000; and 658 miles of second main track has cost \$36,000,000. Large additions to the motive power and rolling stock of the company have cost \$61,000,000. To meet these expenditures the company, from time to time, issued its mortgage bonds, amounting to \$234,000,000, and also its capital stock, amounting to \$125,800,000. With the exception of about \$50,000,000 of these bonds, which bear 5 per cent, the interest rates are from 4 to 4½ per cent per annum. No short-time notes or car trust certificates have been issued. The fixed annual charges have been increased approximately \$9,500,000, mainly for the Puget Sound extension. At the time this extension was determined upon the board deemed its construction necessary in order to maintain and insure the future prosperity of the company, and subsequent events have fully confirmed its judgment in that respect. The resources of this vast domain of territory, tributary to this extension, are immeasurable, and have already furnished a large traffic, both freight and passenger, and will continue to furnish an increasingly larger traffic from year to year. And if conditions, such as cost of labor, fuel, material and supplies, had not radically changed, this company would have easily earned its interest charges, its usual dividends and a substantial amount of surplus. The increases in wages alone paid to the employees of this company for the half-year ended June 30 last amount to approximately \$2,000,000. Because of this radical change in operating conditions, the board has deemed it wise to pursue a conservative course. . . ."

CHICAGO & EASTERN ILLINOIS.—The foreclosure sale of this road has been postponed until some time next month.

CINCINNATI, HAMILTON & DAYTON.—The receivers, Judson Harmon and Rufus B. Smith, in a circular announcing the delivery of the principal C. H. & D. lines to the Baltimore & Ohio on July 19, as ordered by the court, say that they continue to operate the line from Dayton to Delphos until further notice, and the line from Berlin to Dean until August 1, 1917.

INTERBOROUGH RAPID TRANSIT COMPANY, NEW YORK CITY.—The New York State Public Service Commission, first district, has approved the application of this company for authority to issue five per cent bonds amounting to \$23,053,000. This money is needed to pay the excess of the cost of cars and motive power for new rapid transit lines, over and above the cost as estimated by the company in its report to the commission in March, 1913. The bonds are to be issued under the company's first mortgage of March 20, 1913, and will mature January 1, 1966. The commission stipulates that they shall be sold at not less than 93½. The Public Service Commission, also, after deferring action for several months, has finally approved the whole of the issue of bonds aggregating \$16,436,000, the proposal for which was laid before the commission last year, for similar expenditures.

PENNSYLVANIA.—The report of revenues and expenses for the month of June and for the six months to June 30, issued this week, and covering the whole of the Pennsylvania System, both eastern and western lines, shows, for the half year, total receipts of \$231,673,083, an increase of \$21,068,034 over the same period in 1916; but the increase in operating expenses and taxes was \$31,729,563, so that the railway operating income, \$39,603,819, is \$10,661,529 less than in the same six months of 1916. For the twelve months ending with this report the return on the property investment was 4.90 per cent, as compared with 6.02 per cent for the year ending June 30, 1916. The latest figure, 4.90 per cent, is, however, higher than that for any of the five years preceding that ending on June 30, 1916.

Railway Officers

Executive, Financial, Legal and Accounting

Arthur Lee, vice-president of the Coal & Coke Railway at Elkins, W. Va., has resigned; A. H. Crane has been appointed treasurer, vice C. M. Hendley, resigned, and the title of Charles Ritter has been changed from paymaster and cashier to assistant treasurer. Effective August 1.

S. G. Lutz, whose appointment as vice-president of the Chicago & Alton was announced in the *Railway Age Gazette* of July 27, was born on December 8, 1868, and was graduated from Western College, Toledo, Ohio, in 1887. He entered railway service in November, 1890, as a stenographer in the traffic department of the Iowa Central, and subsequently filled various clerical positions until September, 1894, when he became chief clerk in the freight traffic department. From January, 1898, to April, 1904, he was assistant general freight agent of that road, and was then until December, 1908, assistant general freight agent of the Minneapolis & St. Louis. He was freight traffic manager of both roads from December, 1908, to December, 1909, when he was appointed general freight agent of those roads, the Chicago & Alton and the Toledo, St. Louis & Western at Chicago. In November, 1910, he was promoted to traffic manager of the Minneapolis & St. Louis, and on August 1, 1915, became associated with the Chicago & Alton as general traffic manager, which position he held until his recent appointment as vice-president, as already noted.

Thomas J. Foley, who has been elected vice-president of the Illinois Central, with headquarters at Chicago, effective August 1, was born at Convo, Ohio, on August 26, 1866, and entered railway service on December 20, 1878, as a telegraph operator on the Pennsylvania Lines West of Pittsburgh. In 1879 he became agent for the same road and later served successively as train despatcher at Ft. Wayne, Ind., chief despatcher, assistant trainmaster and transportation inspector of the Pennsylvania Lines. On June 1, 1901, he became associated with the Baltimore & Ohio as assistant general manager at Baltimore, Md. From 1903 to 1904, he was superintendent of the Chicago division of the same road, and in the latter year became general superintendent of the Wheeling system. In 1906 he became special inspector in the transportation department of the Union Pacific at Cheyenne, Wyo., and later was consecutively yardmaster, chief train despatcher and superintendent of terminals at Omaha, Neb., and assistant superintendent of the Nebraska division. On March



S. G. Lutz



T. J. Foley

15, 1910, he was promoted to assistant to the vice-president of the Illinois Central, and from May 1, 1910, to November, 1912, was assistant general manager of the Illinois Central, the Yazoo & Mississippi Valley and the Indianapolis & Southern. In November, 1912, he was promoted to general manager of the same roads, with headquarters at Chicago, which position he held until his recent election.

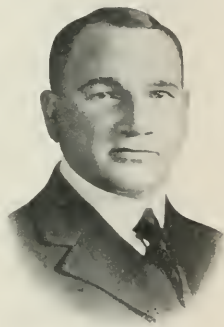
James T. Loree, general manager of the Delaware & Hudson at Albany, N. Y., has been granted leave of absence to enter military service, effective July 31, and F. P. Gutelius, vice-president at Albany, has taken over the duties of the general manager, with title of vice-president and general manager.

B. W. Taylor, general agent of the Southwest System of the Pennsylvania Lines West, at Louisville, Ky., has been elected also president of the Louisville Bridge Company in place of C. H. Gibson, deceased. This company is owner of the Louisville Bridge, the Pennsylvania Lines' entrance into Louisville.

Operating

J. W. Deneen has been appointed assistant superintendent of the Coal & Coke Railway, with headquarters at Gassaway, W. Va.

John J. Pelley, who has been appointed general superintendent of the southern lines of the Illinois Central, with headquarters at New Orleans, La., entered the service of the Illinois Central as a track apprentice on August 29, 1900. On August 1, 1904, he was appointed supervisor on the Indiana division, and on November 1, 1905, was transferred to the Memphis division of the Yazoo & Mississippi Valley. On January 15, 1908, he was appointed roadmaster on the Louisiana division of the Illinois Central, with headquarters at New Orleans. On June 6, 1911, he was transferred to the Tennessee division, and on May 10, 1912, was appointed superintendent of that division, with headquarters at Fulton, Ky. On September 15, 1915, he was promoted to superintendent of the Yazoo & Mississippi Valley, with headquarters at Memphis, Tenn., which position he held until his recent appointment as general superintendent of the southern lines of the Illinois Central, as already noted.



J. J. Pelley

O. F. Johnson has been appointed assistant to the general manager of the Minneapolis & St. Louis, with headquarters at Minneapolis, Minn.

Arthur M. Umshler, trainmaster on the Illinois Central, at Chicago, has been appointed terminal superintendent, with the same headquarters, succeeding Walter S. Williams, promoted.

D. E. Nichols, trainmaster on the Northern Pacific, at Staples, Minn., has been transferred to the Lake Superior division, with headquarters at Duluth, Minn., succeeding H. H. Maher, resigned.

W. D. Deakins, assistant trainmaster of the Chattanooga division of the Nashville, Chattanooga & St. Louis, has been appointed trainmaster of the Nashville division, succeeding E. W. Gaynor, promoted.

Harry W. Grenoble has been appointed assistant superintendent of the Cumberland division of the Baltimore & Ohio, with headquarters at Keyser, W. Va., succeeding J. W. Deneen, who has entered the service of another company.

L. A. Downs, general superintendent of the southern lines of the Illinois Central, with headquarters at New Orleans, La., has been transferred to Chicago and will have charge of the northern lines comprising the Chicago terminal, the Illinois, Indiana and

Springfield divisions. The Illinois Central has divided its lines north of the Ohio river into two grand divisions, the western division comprising the Wisconsin, Minnesota and Iowa divisions.

The authority of the following officers of the Pennsylvania Railroad, with headquarters at Philadelphia, Pa., has been extended over the New York, Philadelphia & Norfolk: Frank C. Hoff, assistant to the general manager; J. C. Johnson, superintendent of telegraph; J. B. Fisher, superintendent of freight transportation; D. C. Stewart, superintendent passenger transportation; H. C. Bixler, superintendent of stations and transfers; T. S. Bell, superintendent of car service, and F. L. DuBosque, superintendent of floating equipment.

Walter Scott Williams, who has been appointed general superintendent of the western lines of the Illinois Central, with headquarters at Waterloo, Ia., was born at Quincy, Ill., on November

6, 1866. He entered railway service on October 1, 1888, with the Illinois Central, as a brakeman, and in January, 1889, was transferred to the position of switchman, serving subsequently as engine foreman and yardmaster. In January, 1891, he became conductor, and in July of the following year was made a brakeman on the Amboy division. In January, 1893, he was promoted to conductor on the Springfield division, and in May, 1904, became trainmaster of the same division. On December 20, 1910, he was appointed superintendent

of the Springfield division, and on October 15, 1912, was transferred to the Minnesota division in the same capacity. On July 15, 1913, he became superintendent of the St. Louis division, with headquarters at Carbondale, Ill., and in April, 1917, was promoted to superintendent of the Chicago terminals, which position he held until his appointment as general superintendent, as already noted.

Floyd Mays, trainmaster on the Yazoo & Mississippi Valley at Wilson, La., has been appointed superintendent of the New Orleans division, with headquarters at Vicksburg, Miss. Victor V. Boatner, superintendent of the New Orleans division, has been transferred to the Memphis division, with headquarters at Memphis, Tenn., succeeding John J. Pelley, promoted. Samuel J. Hays, trainmaster at Memphis, has been appointed terminal superintendent, with the same headquarters, succeeding John M. Walsh, resigned to enter military service.

The Baltimore & Ohio announces that the following lines of the Cincinnati, Hamilton & Dayton have been acquired, and will be operated as the Toledo division of the Northwest district of the Baltimore & Ohio, with division headquarters at Dayton, Ohio: Main line from Cincinnati to Toledo and terminals; Dayton to Wellston, with branches to Riverton, Buckeye Furnace, etc.; Ironton Junction to Berlin; Hamilton to East Middletown; Troy to Piqua; Deshler to Findlay; Tontogany to North Baltimore and the Home Avenue Railroad. The following former officers of the C. H. & D. retain the same positions in the new organization: H. B. Voorhees, general superintendent, at Cincinnati, Ohio; F. B. Mitchell, superintendent at Dayton; M. S. Kopp, assistant superintendent at Cincinnati; S. U. Hooper, assistant superintendent at Toledo; R. W. Brown, trainmaster at Dayton; C. W. Havens, trainmaster at Lima, and R. B. Fitzpatrick, trainmaster at Cincinnati. E. J. Correll, division superintendent at Dayton, has been appointed assistant superintendent at the same place. H. W. Brant has been appointed trainmaster at Dayton, and W. H. Crist, W. L. Augspurger and J. J. Fitzmartin, chief train dispatchers, all with offices at Dayton.

John Bose, superintendent of the Louisville division of the Louisville & Nashville, has been appointed superintendent of the New Orleans & Mobile division, vice C. Marshall, retired from active service, and W. F. Sheridan, assistant superintendent of transportation at Louisville, has been appointed superintendent of the Louisville division, vice Mr. Bose; W. J. Haylow, inspector of transportation at Birmingham, Ala., succeeds Mr. Sheridan; J. A. Morrison, assistant superintendent of the Birmingham division at Birmingham, has been appointed superintendent of the Kentucky division, with headquarters at Paris, Ky., succeeding W. H. Anderson, deceased.

Albert E. Clift, who has been appointed general manager of the Illinois Central, with headquarters at Chicago, was born at Urbana, Ill., on October 15, 1869. He entered railway service



A. E. Clift

with the Illinois Central on December 5, 1888, as a brakeman, and on April 8, 1892, was promoted to conductor on the same road. On April 14, 1892, he became conductor on the Cleveland, Cincinnati, Chicago & St. Louis, and on February 19, 1893, returned to the Illinois Central as engine foreman of the Champaign district. From March 7, 1893, to February 22, 1905, he served consecutively as yardmaster, conductor of the Chicago district, passenger conductor Chicago division, acting trainmaster of the Chicago district at Kankakee, Ill., and trainmaster of the Chicago division. On the latter date he became superintendent of the Freeport division at Freeport, and on January 16, 1907, was transferred to the St. Louis division at Carbondale. On June 1, 1910, he was promoted to general superintendent of the southern lines, with headquarters at New Orleans, La., and on May 10, 1912, was appointed general superintendent of the northern and western lines at Chicago, which position he held until his appointment as general manager, as already noted.

Traffic

F. J. Burns has been appointed general agent on the Denver & Rio Grande, with headquarters at Leadville, Colo., succeeding S. M. Brown, retired on a pension.

F. L. Gamble, agent for the Western Pacific at Stockton, Cal., has been appointed general agent of the traffic and transportation departments, with the same headquarters.

W. T. Kyzer, agricultural agent of the Norfolk Southern at Norfolk, Va., having resigned, all matters heretofore handled by his office will be taken care of by E. D. Kyle, traffic manager.

T. T. Webster, chief of tariff bureau of the Michigan Central, has been appointed assistant general freight agent, with office at Detroit, Mich., vice F. H. Thompson, resigned to engage in other business.

G. W. Hibbard, general passenger agent, western lines, of the Chicago, Milwaukee & St. Paul, at Seattle, Wash., has resigned, effective August 1, and A. P. Chapman, Jr., general agent of the passenger department has been appointed assistant general passenger agent, with headquarters at Seattle.

H. R. Judah, assistant general passenger agent of the Southern Pacific at San Francisco, Cal., has retired from active service under the company's pension system. Mr. Judah was born at New York on June 24, 1847, and entered railway service with the Southern Pacific on November 13, 1872. From that date until November 1, 1877, he was successively chief clerk to the freight auditor, ticket auditor and chief clerk to the general passenger and ticket agent. On November 1, 1877, he was promoted to assistant general passenger and ticket agent of the northern division, and on May 1, 1891, became assistant gen-

eral passenger agent, with headquarters at San Francisco, which position he held until his recent retirement.

Harold K. Faye, whose appointment as traffic manager of the Western Pacific was announced on July 27, was born at Aurora, Ill., in January, 1885. Mr. Faye received his early training in traffic matters under the late Darius Miller, formerly president of the Chicago, Burlington & Quincy. He began railway work as a stenographer in the general freight office of the Burlington at Chicago. In December, 1904, he was made secretary to Darius Miller, then vice-president in charge of traffic, and in June, 1909, was promoted to chief clerk in the same office. He was later promoted to assistant in the office of the vice-president, the position he has held until the present time. As traffic manager of the Western Pacific. Mr. Faye will have headquarters at San Francisco, Cal.



H. K. Faye

Albert T. Weldon, whose appointment as general freight agent of the Canadian Government Railways, with headquarters at Moncton, N. B., has already been announced in these columns, was born on March 6, 1876, at Dorchester, N. B., and entered the service of the Intercolonial Railway on August 24, 1890, as car checker at the local freight office at Moncton. In 1901 he became chief clerk to the division freight agent at Halifax, remaining in that position until 1904, and then left the service of the Intercolonial, but returned to that road on November 17, 1907, as division freight agent at Halifax. In 1909 he became general freight and passenger agent of the Black Diamond Steamship Line, owned and operated by the Dominion Coal Company. He went to the Canadian Government Railways as assistant general freight agent at Moncton on October 1, 1914, which position he held until his recent appointment as general freight agent, as above noted.



A. T. Weldon

H. S. Leard, general passenger agent of the Norfolk Southern at Norfolk, Va., has resigned, and J. F. Dalton has been appointed general passenger agent, in addition to his duties as general freight agent, with headquarters at Norfolk.

H. E. Warburton, division freight agent of the Cincinnati, Hamilton & Dayton, at Dayton, Ohio, has been appointed general freight and passenger agent for the receivers of the C., H. & D., lines Dayton to Delphos, Ohio, inclusive, and Berlin to Dean, Ohio.

Engineering and Rolling Stock

The authority of W. D. Faucette, chief engineer of the Seaboard Air Line at Norfolk, Va., has been extended over the Tampa & Gulf Coast.

S. L. Church, supervisor of the Pennsylvania Railroad at Lancaster, Pa., has been appointed division engineer of the Delaware division, with headquarters at Wilmington, Del.

L. C. Frohman has been appointed principal assistant engineer of the Florida East Coast, with headquarters at St. Augustine, Fla.; C. S. Coe, engineer maintenance of way at St. Augustine, having resigned to enter military service, his former position has been abolished.

The authority of J. T. Wallis, general superintendent of motive power of the Pennsylvania Railroad at Altoona, Pa., and of C. D. Young, superintendent of motive power of the Philadelphia, Baltimore & Washington, at Wilmington, Del., has been extended over the New York, Philadelphia and Norfolk.

F. J. Parrish, division engineer of the Cincinnati, Hamilton & Dayton, at Dayton, Ohio, is now division engineer of the C., H. & D. lines, now comprising the Toledo division of the Northwest district, of the Baltimore & Ohio, and H. G. Snyder and W. P. Ball have been appointed assistant division engineers. All with headquarters at Dayton. (See Operating Officers.)

W. D. Johnston, master mechanic of the Cincinnati, Hamilton & Dayton, at Dayton, Ohio, has been appointed master mechanic of the Toledo division of the Northwest district, of the Baltimore & Ohio, with office at the same place; M. P. Hoban has been appointed road foreman of engines at Dayton, and O. R. Stevens has been appointed road foreman of engines at Lima, Ohio. (See Operating Officers.)

The authority of the following officers of the Pennsylvania Railroad has been extended over the New York, Philadelphia & Norfolk: W. G. Coughlin, engineer maintenance of way at Philadelphia; C. H. Niemeyer, assistant engineer of maintenance of way in charge of roadway and track at Philadelphia; G. C. Koons, assistant engineer of maintenance of way in charge of bridges and structures at Philadelphia; J. C. Auten, principal assistant engineer at Wilmington, Del., and A. H. Rudd, signal engineer at Philadelphia.

Arthur N. Davidson, who was recently appointed principal assistant to the district engineer maintenance of way on the Baltimore & Ohio Southwestern at Cincinnati, Ohio, was born at Tippecanoe on November 2, 1880, and was educated at Denison University. He entered railway service with the Baltimore & Ohio in May, 1899, at Cleveland, and later served successively until October 10, 1906, as carpenter, axeman, levelman, chainman and transitman. On June 1, 1907, he was transitman on the Florida East Coast, and four months later he became field engineer for the Wood Harmon Company at Pittsburgh, Pa. On June 1, 1909, he was made deputy county engineer at Newark, N. J., and on June 1, 1910 he became assistant engineer on the Baltimore & Ohio at St. George, S. I., N. Y. On March 1, 1913, he was appointed district bridge inspector on the Cincinnati, Hamilton & Dayton at Cincinnati, after which he served consecutively as division bridge inspector at Indianapolis, Ind., and at Dayton, Ohio, and assistant engineer at Dayton. On September 1, 1916, he was promoted to assistant division engineer, which position he held until his recent appointment as principal assistant to the district engineer maintenance of way on the Baltimore & Ohio Southwestern.

Railway Officers in Military Service

E. W. Crabtree, despatcher on the Tennessee and Coosa branch of the Nashville, Chattanooga & St. Louis, has entered the signal corps of the army, and is in training at Ft. Oglethorpe, Ga.

D. C. Rhysburger, assistant engineer in the valuation department of the Chicago, Milwaukee & St. Paul, at Chicago, has been commissioned captain in the Engineer Officers' Reserve Corps, and has been assigned to Ft. Leavenworth, Kan. Phillip R. Elfstrom, assistant engineer at Chicago, and C. H. Poole, assistant engineer at Milwaukee, Wis., have been commissioned first lieutenants in the Engineer Officers' Reserve Corps. Lieut. Poole has been assigned to Ft. Leavenworth. C. U. Smith, assistant engineer at Milwaukee, is captain of the first battalion, Engineers, Wisconsin National Guard, and is stationed at Camp Robinson, Wis.

OBITUARY

C. M. Anderson, trainmaster on the Minneapolis, St. Paul & Sault Ste. Marie, at Ironwood, Mich., lost his life on July 23, in an effort to save his two sons from drowning.

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Volume 63

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No. 6

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An idea of the magnitude of the operations to be undertaken by the American forces in France is to be gained from the recent government purchase of 150,000 tons of 80-lb. rails for use overseas.

An American Railroad in France

This is equivalent to 600 miles of double track line, and will make up the principal part of the railway to be constructed from the French port to the portion of the battle front to be occupied by the American troops, together with terminal developments, sidings, etc., which will be required to take care of the war traffic. With this order for rails were others for angle bars, track bolts, etc. Still others must be made for the switches and other material necessary to make the complete railroad. There is nothing essentially novel about the shipment of this material to France, since large quantities of all manner of American railway materials and equipment have been finding their way to that country during the last three years. The distinction as to this material, however, is that it will become a part of an American railroad built and maintained by Americans and operated by them with American equipment. What better opportunities have ever been afforded the American manufacturers to demonstrate the merits of their products? It is true that the service will be severe and that maintenance will be reduced to the very minimum that can be permitted without impairing the efficiency of operation, but this disadvantage is more than offset by the fact that the entire road will be in the hands of men thoroughly familiar with the standards of track and rolling stock which they are to handle. French railway men will have an opportunity to compare English and American railway materials and methods under French conditions, and American standards should not suffer by the comparison.

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The controversy between yardmen in the Chicago district belonging to the Brotherhood of Railroad Trainmen and 19 railways having terminals in Chicago, which resulted in a strike from July 28 to July 30, was finally settled by an agreement reached on August 1.

Victory for Railways in Yardmen's Strike

The developments previous to and during the strike, together with the intervention of representatives of the other railway brotherhoods, were covered in the *Railway Age Gazette* for August 3, page 198. The settle-

ment was a complete victory for the railroads. The controversy arose over three demands made by the Brotherhood of Railroad Trainmen. One of these related to the reinstatement of employees who have left the service of the companies, and another to the employment of new men. Both of these demands of the Brotherhood of Railroad Trainmen were formally withdrawn. The other of the three main points in controversy related to the appointment of yardmasters and assistant yardmasters. The Brotherhood of Railroad Trainmen demanded a rule providing that "in the employment of yardmasters and assistant yardmasters the senior qualified yardmen shall be given preference." The Managers' Conference Committee offered a rule providing that "in the employment of yardmasters and assistant yardmasters the senior yardmen will in all cases be given full and unprejudiced consideration." The rule proposed by the Managers' Conference Committee was accepted in the final agreement. In other words, the Brotherhood of Railroad Trainmen withdrew two of the demands which it struck to enforce and accepted the proposal made before the strike by the railways for the settlement of the third point in controversy. The Brotherhood of Railroad Trainmen ordered the strike in Chicago without any substantial cause or justification, and within a few hours after the strike began it was evident that it was lost. The brotherhood gained nothing by its action but an increase of public disfavor.

The "Peanut" Privilege

"Do you know, it gets my goat the way the public everlastingly slams the railroads for the discourtesy and ill-treatment patrons often get at some of the station news-stands, soda fountains and candy counters; and the funny part of it is that the railroads don't run these things at all." But, then, is it so strange? How can any one legitimately expect the average traveler to understand that these stands are not run by the stationmaster, but by concessionaires? They all look alike to him, ticket agents, red-caps, trainmen, train "butchers," and clerks at the candy counters. He has neither time to notice that the clerks wear some name other than the railroad's on their hats, nor does he care. If he receives discourteous treatment he naturally blames it on the railroad; and there goes another potential bit of friendship for the road. The way some of the concessionaires let their em-

ployees treat the public would almost make one think that they were working the peanut privilege at the old-time circus. To be sure, they do not sell bad goods, nor do they give short weight or change, but they do too often act as if it were a case of here today and gone tomorrow; or, in other words, as if courtesy did not count. The railroad must hold itself directly responsible for any ill-feeling this may engender on the part of its patrons. If the owners of the concessions do not realize that plain ordinary courtesy is the best selling argument ever invented, the railway must be just that more insistent. Constant inspection by the stationmaster and insistent jacking-up will do it. Courtesy at the news-stand, at the ticket window and on the train is all the same and always the best producer of good-will on the part of the public; and in these days of threatening wartime stress and strain on the transportation facilities, no railway can take any chances with the good will of the public. Fortunate are those railways in whose stations the concessions make courtesy the most emphasized point of service.

ALL RAILWAY RECORDS BEING BROKEN

ALL previous records of American railways for volume of traffic moved, for earnings made, for expenses incurred and for taxes paid are rapidly being broken. This is shown by statistics of the Class I roads for the five months January to May, inclusive, of the present year, and especially for the month of May, the statistics for which only recently became available. In the five months January to May, 1917, Class I roads—those earning over \$1,000,000 gross each—earned a total of \$1,548,348,314. This was an increase of \$156,000,000, or 11.2 per cent over the same months of 1916; an increase of \$348,000,000, or 29 per cent, over the same months in 1913 and an increase of 48.7 per cent over the same months of 1911. Their operating

TABLE I.—RELATION OF OPERATING EXPENSES AND TAXES TO OPERATING REVENUE FOR THE FIRST FIVE MONTHS OF CALENDAR YEARS 1911 TO 1917 CLASS I ROADS

	Operating revenue	Operating expenses	Taxes	Operating income	Per cent taxes to op. revenue	Per cent op. income to op. revenue
1917....	\$1,548,348,314	\$1,118,273,075	\$71,781,362	\$357,942,675	4.63	23.11
1916....	1,392,204,458	946,856,667	61,807,317	383,452,304	4.44	27.55
1915....	1,119,782,397	816,264,760	55,793,316	247,469,337	4.91	22.09
1914....	1,135,573,133	864,341,338	57,144,848	213,355,639	5.03	18.70
1913....	1,200,112,304	886,248,276	51,822,504	260,337,563	4.32	21.69
1912....	1,085,142,112	797,375,850	48,256,122	238,354,947	4.45	21.97
1911....	1,041,989,371	746,989,146	43,267,596	251,155,703	4.15	24.10
Increase 1917 over 1911, per cent....	48.7	49.7	65.9	42.5		
Increase 1917 over 1913, per cent....	29.0	26.1	38.5	37.5		
Increase 1917 over 1916, per cent....	11.2	18.1	16.1	— 6.6		

expenses were \$1,118,300,000, an increase of \$171,400,000, or 18 per cent over the same months of 1916, and of \$232,000,000, or 26 per cent, over the same months of 1913. The increase in total earnings over the same months in 1911 was 48.7 per cent and in operating expenses 49.7 per cent.

Among the largest increases of all is in taxes. In the first five months of 1917 they amounted to \$71,781,362. This was an increase of \$9,900,000, or 16 per cent, over the same months of 1916; an increase of 38½ per cent over the same months of 1913, and an increase of 66 per cent over the same months of 1911.

While the increase in total earnings over 1916 was \$156,000,000, the increase in operating expenses and taxes together was \$181,650,000. In consequence, for handling \$156,000,000 more business the railways in these months received \$25,900,000 less net operating income. As compared with 1913, however, net operating income showed an increase of 37½ per cent and as compared with 1911 an increase of 42½ per cent.

The proportion of total earnings required to pay operating expenses and taxes shows a sharp increase. In the first five months of 1911 it took 76 cents out of each dollar of earnings to pay operating expenses and taxes. In those months of 1913 this increased to 78 cents, and in 1914 it increased to the record-breaking figure of 81 cents. In 1916 it dropped to 72½ cents, but in 1917 it increased to 77 cents. While, therefore, net operating income has thus far been larger than in any previous year except 1916, the increases in operating expenses and taxes have been so great that net operating income has become relatively a much smaller part of the total amount earned.

The bulk of the increase in total earnings is being derived, of course, from the handling of freight. Freight earnings in the first five months of the year were over \$97,000,000 greater than they were in the same months of 1916, an in-

TABLE II.—COMPARISON OF OPERATING REVENUES, FREIGHT REVENUES, TAXES AND OPERATING INCOME FOR THE FIRST FIVE MONTHS OF THE CALENDAR YEARS 1917, 1916 AND 1913 EASTERN, WESTERN AND SOUTHERN DISTRICTS

	Freight Revenue		Southern District	Western District
	United States	Eastern District		
1917.....	\$1,104,928,239	\$490,569,895	\$174,566,114	\$439,792,210
1916.....	1,007,673,593	463,467,591	158,442,814	385,763,188
1913.....	847,431,978	385,772,635	137,460,256	324,199,087
Increase 1917 over 1916, per cent....	9.7	5.8	10.2	14.0
Increase 1917 over 1913, per cent....	30.4	27.2	27.0	35.6
	Operating Revenue			
1917.....	\$1,548,348,314	\$692,997,424	\$237,874,785	\$617,476,105
1916.....	1,392,204,458	642,258,225	212,082,555	537,863,678
1913.....	1,200,112,304	536,272,481	190,183,798	473,656,025
Increase 1917 over 1916, per cent....	11.2	7.9	12.2	14.8
Increase 1917 over 1913, per cent....	29.0	29.2	25.1	30.4
	Taxes			
1917.....	\$71,781,362	\$28,959,455	\$11,438,455	\$31,483,452
1916.....	61,807,317	35,196,551	8,994,743	27,706,023
1913.....	51,822,504	32,667,732	7,005,555	22,449,217
Increase 1917 over 1916, per cent....	16.1	14.9	28.5	13.6
Increase 1917 over 1913, per cent....	38.5	29.5	63.3	40.2
	Operating Income			
1917.....	\$357,942,675	\$130,898,489	\$65,510,909	\$161,533,277
1916.....	383,252,304	175,010,810	63,838,593	147,402,901
1913.....	260,337,563	105,064,221	43,963,114	111,310,228
Increase 1917 over 1916, per cent....	6.6	— 25.2	2.6	9.6
Increase 1917 over 1913, per cent....	37.5	24.6	26.2	45.1

crease of 9.7 per cent, and about \$160,000,000 greater than they were in the same months of 1913, the record year before 1916, an increase of 30.4 per cent.

The month of May was a record-breaker in numerous ways. The total earnings of \$345,773,079 were greater than those ever made in a single month before in the history of American railways. The record was previously held by October, 1916, but earnings in May were \$7,470,000 greater than in October, 1916. The operating expenses incurred in May also broke all previous records for a single month. They amounted to \$238,682,000, which was about \$9,500,000 more than they were last March, in which they reached the previous high record. It is a notable fact, however, that while both operating revenues and operating expenses broke all records in May, the record for net operating income was very far from broken. Net operating income in May was \$92,079,000. There were five individual months in 1916, three in 1915 and one in 1912 when it exceeded this amount. In October, 1916, with total earnings \$7,400,000 less than in May, 1917, the railways had net operating income \$22,000,000 greater than in May. These figures show in a striking manner how much faster, relatively, increases in operating expenses and taxes have been occurring than increases in total earnings. Reports to the Railroads' War Board show that in May, 1917, railways having 173,105 miles of line handled 29,522,870,109 ton-miles of freight, or 16 per cent more than in May, 1916. This undoubtedly is the largest freight traffic ever carried.

The railways of the three large territories, East, West and South, have benefited in widely differing degrees by the increases in total earnings. The eastern lines had an increase of \$50,700,000, or 7.9 per cent in total earnings, in the first five months of 1917 as compared with the same months of 1916, but the increases in their operating expenses and taxes were so large that their net operating income declined \$44,200,000, or 25 per cent. The southern lines, with an increase of 12.2 per cent in total earnings, had an increase of 2.6 per cent in net operating income, and the western lines with an increase of 14.8 per cent in total earnings had an increase of 9.6 per cent in net operating income.

Any presentation of the facts about the increases in railway earnings, operating expenses, taxes and net operating income which did not include some analysis of the increases in operating expenses would be incomplete. It is a truism of railway economics that a railway on which maintenance expenses are large compared with transportation expenses probably is in a healthy condition, while one on which transportation expenses are large compared with maintenance expenses probably is not in a healthy condition. Within the last eighteen months, and especially within the last year, there have been large advances in the wages of labor and

transportation expenses to total operating expenses. In the first five months of 1913 transportation expenses were 51.4 per cent of total operating expenses; in the same months of 1916, 50.9 per cent; and in the same months of 1917, 53.2 per cent. In these months of 1913, maintenance of equipment expenses were 23.9 per cent of total operating expenses; in 1916, 25.5 per cent, and in 1917, 24.2 per cent. In the first five months of 1913, maintenance of way expenditures were 18.3 per cent of the total; in 1916, 17.4 per cent; in 1917 only 15.9 per cent.

The largest increase in transportation expenses relatively

TABLE IV.—RELATION OF MAINTENANCE EXPENSES TO TOTAL OPERATING EXPENSES FOR THE FIRST FIVE MONTHS OF THE CALENDAR YEARS 1911 TO 1917—CLASS I ROADS

TABLE III.—RELATION OF TRANSPORTATION EXPENSES TO TOTAL OPERATING EXPENSES FOR THE FIRST FIVE MONTHS OF CALENDAR YEARS 1911 TO 1916—CLASS I ROADS

Transportation Expenses							
United States	Per cent of total	East	Per cent of total	South	Per cent of total	West	Per cent of total
1917.. \$594,395,568	53.2	\$295,586,238	55.5	\$79,107,114	49.1	\$219,702,216	51.8
1916.. 474,320,522	50.9	231,892,267	52.1	64,500,755	46.3	178,127,500	49.1
1915.. 413,368,227	50.6	192,513,168	51.3	60,241,350	48.4	160,615,709	50.8
1914.. 444,102,289	51.4	207,687,987	52.4	68,781,363	48.8	167,632,939	51.2
1913.. 456,011,558	51.4	211,974,537	52.0	68,164,789	48.9	175,872,232	51.7
1912.. 427,780,318	53.4	199,076,516	54.1	62,050,991	49.7	164,702,811	54.0
1911.. 394,669,107	52.8	193,911,065	53.8	48,098,998	48.9	152,659,044	52.6
Increase 1917 over 1911, per cent...	50.6	52.4		64.6		43.9	
Increase 1917 over 1913, per cent...	30.3	39.4		16.1		24.9	
Increase 1917 over 1916, per cent...	25.3	27.4		23.0		23.4	

also in the prices of all materials and supplies used in operation and maintenance. These advances in wages and prices of materials and supplies would, other things being equal, affect the expenses of all the branches of the operating department—transportation, maintenance of way and maintenance of equipment. The figures show, however, that the increases in transportation expenses have been relatively much larger than those for maintenance of way and of equipment.

In fact, the increases in transportation expenses during the present year thus far have been so great as to be alarming. While the increase in total earnings in five months of 1917 over 1916 was 11 per cent and the increase in total operating expenses was 18 per cent, the increase in transportation expenses was \$120,075,000, or 25 per cent. The importance and ominousness of this increase becomes more apparent when it is realized that it has taken place in spite of unusual increases in the average trainload and the average carload. It reflects chiefly, first, the advance in the wages of train service employees due to the Adamson law, and second, the large advances which have occurred in the prices of fuel. The increase in expenditures for maintenance of equipment over 1916 was 12 per cent and the increase in expenditures for maintenance of way, 8 per cent. The same general tendency is shown when comparison is made between the first five months of 1913 and the first five months of 1917, the increase in the cost of conducting transportation being 30.3 per cent; that of maintenance of equipment, 27.6 per cent; and that of maintenance of way, 9.3 per cent.

The result has been a substantial increase in the ratio of

United States				
	Maintenance of way	Per cent of operating expenses	Maintenance of equipment	Per cent of operating expenses
1917.....	\$177,319,957	15.9	\$270,762,754	24.2
1916.....	164,515,842	17.4	241,081,982	25.5
1915.....	138,865,835	17.0	201,745,373	24.7
1914.....	150,858,470	17.4	210,960,834	24.4
1913.....	162,272,938	18.3	212,132,018	23.9
1912.....	132,802,787	16.7	185,172,650	23.2
1911.....	130,671,086	17.5	169,614,185	22.7
Increase, 1917 over 1911, per cent....	35.8		59.9	
Increase, 1917 over 1913, per cent....	9.3		27.6	
Increase, 1917 over 1916, per cent....	7.7		12.3	
Eastern District				
1917.....	\$73,406,782	13.8	\$131,212,564	24.6
1916.....	68,491,832	15.4	115,941,155	26.1
1915.....	58,753,501	15.7	96,992,116	25.9
1914.....	63,545,236	16.0	101,844,880	25.7
1913.....	70,453,893	17.3	102,705,664	25.2
1912.....	56,371,947	15.4	90,462,489	24.6
1911.....	57,238,887	15.9	84,681,339	23.6
Increase, 1917 over 1911, per cent....	28.4		54.9	
Increase, 1917 over 1913, per cent....	4.2		27.8	
Increase, 1917 over 1916, per cent....	7.1		13.2	
Southern District				
1917.....	\$27,450,656	17.0	\$42,531,259	26.4
1916.....	24,937,910	17.9	39,204,593	28.2
1915.....	35,408,863	18.8	31,869,016	25.6
1914.....	24,786,434	17.6	36,811,102	26.1
1913.....	26,370,873	18.9	35,164,837	25.2
1912.....	25,525,219	18.4	31,237,843	25.0
1911.....	19,134,305	19.4	23,646,482	24.1
Increase, 1917 over 1911, per cent....	43.7		79.9	
Increase, 1917 over 1913, per cent....	4.1		21.0	
Increase, 1917 over 1916, per cent....	9.7		8.5	
Western District				
1917.....	\$76,460,419	18.0	\$97,108,931	23.9
1916.....	71,116,100	19.6	85,936,234	23.7
1915.....	56,703,471	17.9	72,884,241	23.1
1914.....	62,526,800	19.1	72,304,852	23.1
1913.....	65,448,172	19.2	74,361,517	21.9
1912.....	53,708,621	17.6	63,472,318	20.8
1911.....	54,307,894	18.7	61,286,364	21.1
Increase, 1917 over 1911, per cent....	40.8		58.4	
Increase, 1917 over 1913, per cent....	16.8		30.6	
Increase, 1917 over 1916, per cent....	7.5		13.0	

to maintenance expenses has occurred on the Eastern lines both between 1913 and 1917 and between 1916 and 1917. But while the eastern lines have been in every way the hardest hit by advancing expenses, the general tendency has been the same throughout the country. In other words, the general tendency has been for operating expenses to increase faster in proportion than total earnings, for cost of conducting transportation to increase faster than expenditures for maintenance and for taxes to increase fastest of all. The expenditures for maintenance of way have shown an especially small increase relatively.

The foregoing facts must be left to speak for themselves. While they show that the railways are handling the largest business that they ever did, it cannot be said that the general conditions under which they are handling it are satisfactory. In the course of time the advances in rates that the Interstate Commerce Commission has granted to the eastern lines and

the much smaller advances granted to the southern and western lines will go into effect. These and especially the advances in eastern territory, will moderate the tendency of earnings and operating expenses to converge and will give the railways larger means for maintenance.

While absolutely the increases in expenditures for maintenance, and especially those for maintenance of equipment, have been large, appearances indicate that they have been due entirely to advances in the wages of labor and in the prices of materials and supplies. In fact, the increases in expenditures for maintenance of way and structures have been so small relatively as to suggest forcibly that railway properties are not being as well maintained, on the whole, as is desirable. Probably this is in a large measure due to the inability of the roads to get enough labor for maintenance of way and partly to fear that if they spend any more they may regret it in future.

The statistics afford material for an interesting study, but it is very difficult to draw any satisfactory conclusion from them as to what future developments will be if the traffic handled and total earnings continue to increase. If there should be a sudden and large shrinkage of traffic and total earnings there probably would be serious trouble for many railways, but no such shrinkage of earnings is now in prospect.

GIVING ENGINEMEN A SECOND CHANCE

ONE of the primary reasons for publishing the discussion on the use of the overlap in automatic signaling, which appears in this issue, is to draw operating men into a fuller consideration of the problem of eliminating those collisions which are due to over running signals. Operating men obviously cannot be informed on the technicalities of signaling, but this matter is not a technicality. It is, strictly speaking, more within the province of the operating department than the signal department. Operating men should know exactly the results they desire to obtain in safeguarding train operation. They are the authorities on each road who must decide whether, through some course of discipline, they will compel obedience to a single stop signal and a single caution signal, whether the enginemen shall be given a second chance by the introduction of a second stop or a second caution signal, or whether an automatic device shall be installed to insure obedience to a single indication.

As pointed out in the discussion referred to, opinions as to the overlapping of stop signals vary over a wide scope from the man who considers this practice a necessary factor of safety to the one who regards it as an absolute menace to safe operation. With the exception of the special cases pointed out in the article, however, the preponderance of evidence is certainly against the overlapping of stop signals. Even those who advocate it do not maintain that it strikes effectively at the cause of the trouble. For caution signals, overlapping is more in favor. The arguments under this head, however, resolve themselves into the well-known pros and cons for so-called "simplified signaling."

The suggestions for dealing with the problem without the use of the overlap bring out the usual methods. One man, in effect, tells his enginemen that they cannot trust the signals, and the one representing the opposite view makes no allowance for an engine passing a stop signal at any time or under any circumstances. There are several points which ought to have further discussion by interested operating officers along this line. Among them are the use of signal instructors to accomplish the dual purpose of instructing the men and inspiring confidence in the signals; the course to be taken when a signal goes to the stop position in the face of a train on a road having strict rules against over running signals; and the loss of time resulting from strict observance of caution signals through a long block.

Letters to the Editor

INITIATIVE—ORGANIZATION AND EDUCATION

CHICAGO, Ill.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

We read so much, nowadays about initiative, how it was recognized in a certain man's rapid rise and how the railroads of the country are beating the brush for men with initiative. The writer is, at present, vice-president and director in two manufacturing concerns employing quite a large number of skilled and unskilled workmen, as well as some of the best salesmen in the country. Outside of his business training, he has had 25 years' experience in railroad work, from track laborer to superintendent, and is thus partially qualified to throw some light on this subject.

It requires considerable nerve in present-day railroading, with its reels of red tape, for a junior official to take the initiative and do what he knows to be good railroading, without the sanction of his superior officer—for he is likely to get a curt letter or message from headquarters (not always dictated by his superior) asking why he exceeded his authority. Such communications often come in plain English over the wire, or in the open mail, so that every operator or clerk is fully aware that the boss has been called down by the man higher up. After he gets two or three such documents, they begin to smart, and he, like thousands of others, joins the clearing house brigade and gets the habit of passing important matters up to higher authority—often without a suggestion, in order to avoid any humiliation by having his action or suggestion criticised. Thus, another man capable of development has an iron band put around him which keeps him from expanding, and the railroad practically loses the investment it has made.

There is no business in the world where so much natural initiative is allowed to perish as in the railroad business. Just look around and see the number of railroad men in other lines of activity—talk to them, and find out why they left the service. One will discover, in many cases, that their initiative was checked by some superior who was not big enough to see the worth of practical suggestions or to give credit where it was due, with the consequence that the man who is alive hunts for fields where he can develop, and he finds them in the commercial world. Knowing railroad officials and their line of comment, as I do, I can tell you in advance that many who read this article, will say it is the babbling of a disgruntled railroad man; on the contrary, let me say again, it comes from one who has always been permitted to do pretty much as he pleased in the various jobs he has filled. My statements are actuated only by sympathy for the thousands of railroad officials in the United States who would like to initiate, instead of going to the vice-president in charge of the department before making the simplest decision. How many times have you witnessed the promotion in subordinate offices of some live youngster to the responsible position of chief clerk, and, in a few days, have headquarters inform the man in charge that they have a man in the general office they will send to take the place. When he arrives it is found he is a near relative of the man higher up, or a close friend who is being taken care of at the expense of the subordinate organization. Don't you think that paralyzes initiative? We have all seen such stunts—not so many today as a few years ago—but too many yet for railroads to be run on the cold blooded business basis they must conform themselves to, before they get the absolute confidence of the public.

One of the best general managers I ever knew said to me one time, "The reason so many officials make failures is

because they still want to run the job they were promoted from instead of leaving that task to their successor." I have kept close tab on this bit of philosophy for years—it has been a great check valve to my own "butting in," as well as a source of amusement while observing other over-zealous officials sit up night and day trying to be trainmaster, chief despatcher, road foreman of equipment, fill both roadmasters' shoes as well as run the three most important terminal yards on the division. We sometimes hear some of our keen presidents or vice-presidents say they don't understand what the trouble is with the "River" division—"it ran smoothly when I was superintendent there 20 years ago"; but if he could beat back and compare conditions with 20 years ago, he would find 10 times the correspondence, 2000 ton trains as against 20 loads and 40 empties, inadequate side track facilities, antagonistic labor (made so by our failure to work with labor instead of against it), the Adamson law and hundreds of other state and interstate regulations he must keep posted on in order to avoid violations and consequent embarrassment to the higher officials. Is it any wonder the superintendent neglects some of the minor things in his anxiety to please everybody?

If my vision is not too much in eclipse, the railroads of this country will have during this war and for years thereafter, at least until production overtakes demand, the greatest density of traffic ever known, and their talent and facilities will be taxed to the last ounce of efficiency to keep the good will of the public that they may be allowed sufficient revenues to cover necessary maintenance expenses and to finance additional double tracks, needed terminals, etc. This cannot be brought about by consolidation of divisions to effect economies; new divisions should be created. I know of single-track roads that have as much as 800 miles of busy railroad in one superintendent's division, almost three divisions in one. As a result, the superintendent just hits the high places, never gets a chance to mingle with the businessmen he is serving and exchange ideas with them, and, incidentally, be strong enough to have influence with the public and a voice in sending safe and sane men to our state legislatures and our national congress. I hope to see the day when all the clearing houses between the superintendent and the operating head of the railroad will be eliminated, when there will be closer supervision where the work is done, and the superintendent's office will be what it should—a unit of the operating organization.

In order to obtain or develop initiative and the right kind of organization, real educating must be done. In giving my views to a friend who had just been promoted to an important general superintendency, I told him I heard the agent at one of his most important stations tell the superintendent he could get along without a clerk until the fall rush set in, and the superintendent immediately said, "Don't do it, I would never get authority to put him back." How much better to have permitted the agent to put on and take off help as the business fluctuated, and to have held him strictly accountable for net results. My friend immediately said, "That's my idea of organization, and I shall work accordingly." The very next week he selected a yardmaster for one of his most important terminal stations without even consulting the superintendent, trainmaster or the agent, who were held to strict accountability for the results of that terminal. Then not long afterwards he called a couple of engine foremen from one of his yards into his office and dismissed them for trivial offenses, and the superintendent, trainmaster and yardmaster were not consulted. It took my friend a long time to learn that he could not hold all the subordinate positions under him, and he has since told me that he can't understand why any of his lieutenants stood for it.

Why not start the education of an official at the very beginning of his railroad career, or at least, as soon as he becomes

big enough to be placed in charge of even one man, then he will quickly learn to select the best material and that he is held responsible for their performance? The employee will also understand that he is indebted to no one higher up for his position; more especially should such authority be given agents and yardmasters at stations where business is subject to change. If they are not capable of assuming such responsibility, it will soon show in their records and they will have to seek a lower level. My experience has been, however, that there are few failures where the responsibility is checked squarely up to the man in charge and the proper support given him. My idea of railroad education is to drill all classes in the principles of loyalty and line of duty, which can be done on just one basis, viz.: the golden rule.

The most perfect organization I have ever observed was at a small terminal where only about 200 men were employed. In questioning the boss as to why all seemed so anxious to do his bidding, he replied that it took him 15 years to learn never to allow an employee to follow him from one job to another, not even his secretary. It was his theory that the man who could not build an organization out of what he found on any job, wasn't worthy of the name executive; by this treatment he immediately turned the whole bunch into loyal boosters, giving their best licks and all working together. He would employ no one related to him for fear of instilling distrust in some employee's mind. No one could come back to his organization the second time no matter how well he left the service, whether promoted or accepting service elsewhere. All these seemed severe rules to me, but he explained that it was in fairness to the men who stuck on the job. It was surely working well, for every youngster was on his toes trying to see how efficient he could be, for he well knew that no one was going to step in ahead of him when a vacancy occurred. That kind of an organization creates initiative and teaches correct principles of management.

OBSERVER.

EXPORT MORE FROM SOUTHERN PORTS

COLUMBUS, MISS.

TO THE EDITOR OF RAILWAY AGE GAZETTE:

The Car Service Commission has greatly improved conditions generally by modifying the rules with respect to the interchange of cars. The Southern territory, however, is still suffering because of the outbound traffic being greatly in excess of the inbound, especially in Alabama and Mississippi. Several years ago the loads in each direction were about evenly balanced, due largely to the heavy shipments of feed stuff moving from northern markets into the South, but since the southern farmers have diversified their crops and are now raising all of their feed stuffs and shipping their surplus to the northern markets, the outbound shipments are badly out of balance with the inbound when business is normal. During an abnormal business this condition is further aggravated because of the long haul to northern and eastern points and the delay due to congestion and the burdensome task of handling empty cars 1,500 to 2,000 miles back to the Southern territory.

It seems that the only solution of the problem is to work out a plan whereby certain central states may ship a portion of their export traffic to Mobile and New Orleans. This will equalize the load haul in both directions, shorten the empty haul, relieve congestion and save car delays. All roads will then be able to keep cars on their lines approximately equal to their ownership of equipment. It is almost impossible for any line to control its own equipment at all times without taking a step backward, and during an abnormal business, if each road will take car for car, regardless of individual ownership (with the exception of special equip-

ment), it will expedite the movement of traffic and reduce terminal delays in switching.

After the rush period is over, the cars can be worked back in the home direction, but from the present outlook the heavy service demands will continue for some time and there will be a great many old worn out cars condemned and replaced with standard equipment, which will put each road on an equal footing with the rest, so long as they have in their possession cars equal in number to their ownership.

If a plan can be worked out to divide the export shipping between the various ports, I believe the increase in loaded car miles will more than offset any loss due to the pooling of equipment. Additional grain elevators and other storage facilities can be provided at each of these ports if necessary.

F. E. PATTON,

Superintendent, Southern Railway Company in Mississippi.

THE UNIVERSITY OF EXPERIENCE

TOLEDO, O.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I have noted with interest the Letter to the Editor entitled, "Give the Engineer a Chance" in the issue of June 29, and would like to refer to the last part of the fourth paragraph, worded as follows: "Surely the engineman, conductor or yardmaster who works up to superintendent is no better fitted for his position than would be an engineer put through the proper course." But the writer destroys an ideal statement of fact by such an absurdity as "there is no magic in railroad operation. When a man learns that the business of a railroad is to move trains, and that no two trains can occupy the same space at the same time, he has mastered the fundamentals." The fundamentals are not as he explains them, but ability to know details which he would pass over so lightly to his subordinates.

A superintendent, to superintend, must be fairly well versed in the thousand and one details which go to make the correct working of a division; ability to recognize inability, practical knowledge of right of way, equipment and working conditions, the art of despatching, methods of accounting and recording, what is and will be required for more efficient management and the knack of meeting sudden increases with present facilities. If his job is only to superintend and secure a capable organization, as he states, how is he to do it if through inability and lacking in actual experience, he is unable to detect flaws, curtail unnecessary movements, and irregular or careless methods or know that his subordinates are co-operating. Figuratively, he may be able to show economy, whereas as an actual fact there will be lost motion and waste.

The trouble with college men is that while well enough versed in the theoretical they are unqualified in the practical details. Should the university require of them at least several years' experience in yards, on the road, at the fire door of a locomotive, along the right of way and at the desks in the different offices, hard work and actual conditions would give them an insight into the many conditions continuously arising and a knowledge of how to meet them. Knowing kinds and working conditions of equipment, transportation rules, methods and details of manipulation and supervision and classes and manners of men, would be the whole basis of his future ability in the application of his theoretical knowledge. To learn such would take several years of his time and he would be young who gains a superintendency at 33.

Railroad men respect a superior who makes every move count and the respect of subordinates is the most important item in co-operation. The superintendent who demands respect because of his title cannot hope to compete with the superintendent who has won respect through ability and

personality, for there is confidence in the latter. The superintendent who is not capable of "cutting the buck" in each and every department under him is at a standstill, to be passed by the practical man. That is perhaps why the majority of men who to-day are controlling these great complicated systems of commerce are not college men, but men who have fought their way up and know the game, realizing that every day there is something new to learn.

H. H. McFILBER.

SOME SUGGESTIONS REGARDING THE FUSEE

ST. LOUIS, MO.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

In view of the increasing use of the fusee as a day as well as a night signal for track, bridge, station and train employees, it might be opportune at this time to discuss the improvement and standardization of this important signal. Several roads are now using the five-minute red fusee, some use the 10-minute red, while others use the straight yellow, green, or a combination. This variety of fusees leads to more or less conflict among the men in service as well as the additional expense for store departments to carry so many different kinds in stock.

While the five-minute size recommends itself from the standpoint of lower first cost and less bulk to be carried by trainmen, it seems to be unsatisfactory in spacing trains only five-minutes apart. The straight 10-minute red fusee also has the objection of inflexibly spacing trains 10 minutes apart, requiring a dead stop and waiting until the fusee is burned out. This is quite an item of expense with long, heavy trains, besides the extra five-minute loss of time and additional delay in getting trains started, with the usual accompaniment of drawbars pulled out and air hose burst.

While the most generally-used combination—the red and yellow fusee—is commendable in eliminating the dead stop and consequent five-minute and other delays, after the first five-minute (red) portion is burned out, it seems objectionable, as actual demonstration and observation show that it is difficult and sometimes impossible for an engineman on a swaying engine, with the view often more or less obscured, to distinguish between the yellow and the red portions of the fusee, as the difference between the two colors as now manufactured is not pronounced enough. This fusee would thus often have the very natural effect of the straight 10-minute red fusee with its consequent dead stop and added five-minute delay which this style of a fusee was especially designed to eliminate.

It seems to the writer that a combination five-minute red and five-minute green fusee would give the proper necessary distinctive colors for the instant and certain decision of enginemen, the first half furnishing the following enginemen adequate notice of a train immediately preceding, and the second half being a proceed (green) signal, eliminating the dead stop and consequent delay, while at the same time having the subconscious effect of a cautionary signal without its attendant delay. This proposed fusee might more nearly meet the need where it is desired to space trains only five minutes. It would also more nearly eliminate the necessity and expense of carrying so many styles of fusees in service.

In this connection the writer would like to recommend the 34-in. size wood base fusee, instead of the more generally used 78-in. size. Burning demonstrations of these two sizes of fusee have shown that the 34-in. size will give the same flame and service results as the larger size, with less cost, bulk and weight.

It seems to be generally conceded that the right hand side of track, outside of the rail, is the proper position for a burning fusee. This avoids a danger from leaking oils, etc.

GRANT SELBY.



North End of the Inbound Freight House.

Pere Marquette Freight Station at Chicago

While of Moderate Size It Embodies Several Special Features and Conveniences of Modern Development

THE Baltimore & Ohio Chicago Terminal recently completed a new freight station at Chicago for the use of its tenant, the Pere Marquette. While this is a station of only moderate size, it embodies an arrangement of the facilities and the use of features recently developed which are worthy of attention. The inbound freight house is $280\frac{1}{2}$ ft. by $52\frac{1}{2}$ ft. in area, one-half of which is two stories and the other half three stories in height. The outbound house is 250 ft. by 18 ft. in area and one story high throughout. The location diagram shows the relative positions of the in and outbound houses with respect to the tracks. The inbound house is served by three tracks and the outbound house by a maximum of six tracks and as the outside track is adjacent to a concrete roadway it can be used for team track purposes.

THE INBOUND FREIGHT HOUSE

The first floor of the inbound house is used for regular inbound freight house service. The second floor is used for storage, the space being leased to shippers at rates provided for in the tariff. The third floor is used entirely for freight offices and the space is divided into a general office $49\frac{1}{2}$ ft. by 60 ft., an agent's and a cashier's office, each 18 ft. by 18 ft., toilet rooms, coat rooms, a stationery room 16 ft. by 19 ft. 6 in., and a record room 40 ft. by $49\frac{1}{2}$ ft.

Communication with the street is afforded by means of a stairway at the north end of the building, with a lobby on the third floor giving direct communication with the cashier's office and the agent's private office, as well as with the general office. Other stairways are provided at the extreme south end and at the center of the house, the latter communicating directly with the record room on the third floor.

The transportation of storage material from the first to the second floor and return is facilitated by two inclined eleva-

tors provided by the Otis Elevator Company, Chicago, with provision for the future addition of two similar elevators. These consist of inclined runways on a slope of 16 deg., up which the freight trucks are wheeled with the assistance of an endless chain provided with hooks which engage the axles of the trucks.

Auxiliary facilities on the first floor consist of a cold storage room 18 ft. by 26 ft. in the northeast corner of the building and a "lockup" for the storage of valuables 12 ft. by 18 ft. 6 in., in the northwest corner. The cold storage room is equipped for heating to provide a suitable space for the storage of perishables in winter time. Two platform scales 6 ft. by 8 ft. have been installed with Fairbanks self-recording dials graduated to 1,000 lb.

Structurally the inbound freight house consists of an uncovered steel frame with brick curtain walls and a flat pitch gable roof covered with a composition roofing. It is divided into 20 ft. panels longitudinally, this arrangement controlling the spacing of the steel roof trusses and floor girders. The secondary floor beams in three lines span longitudinally between the girders and support wooden joists spanning transversely. The floors consist of yellow pine subflooring, with a $1\frac{1}{2}$ -in. rock mastic surface on the second floor and a 7/8-in. maple wearing surface on the third floor. The first floor is supported on a fill and consists of 6 in. of concrete covered by $1\frac{1}{2}$ in. of rock mastic.

Except at the north end of the building, where space is taken up by the entrance lobby and the special storage rooms, the two sides of the building are enclosed on the first floor by sliding doors continuous from column to column. These are arranged in groups of three each on a separate runway so that two-thirds of the entire space in each 20-ft. bay can be opened for the transfer of freight. The doors along the team side of the building are protected against the weather by an 8-ft. marquis supported on structural steel brackets.

A transverse fire wall divides the building into two sections and is fitted with automatic tin-clad fire doors.

THE OUTBOUND FREIGHT HOUSE

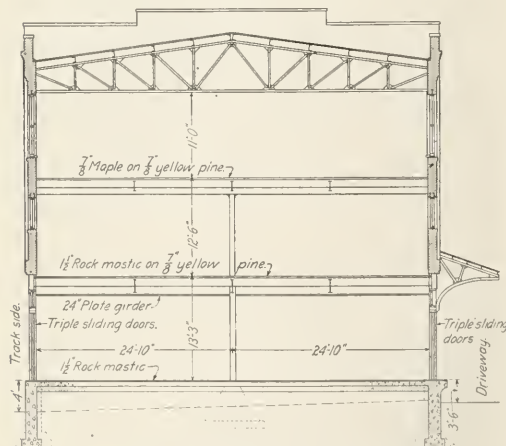
As the outbound freight house is only 18 ft. in width, outside measurement, it is intended purely for the transfer of freight from street vehicles to cars. The doors are arranged the same as in the inbound house and are continuous from end to end. A platform scales and a checking booth, 6 ft. by 5 ft., are provided at every third panel, giving a total of five in all. Four of the scales have 6-ft. by 8-ft.



View from South End of the Outbound House

platforms and the fifth one, in the middle of the building, lengthwise has a 7 ft. by 12 ft. platform. All of these scales are equipped with Fairbanks automatic dials.

The structural design of this house is simple. Columns consisting of 10-in. 25-lb. I-beams are framed into 13-in., 31.5-lb. I-beams over the transoms which carry 13-in. brick walls to the roof line. The roof consists of $\frac{7}{8}$ -in. sheathing covered with a composition roofing and supported on 3-in. joists spaced 24 in. center to center and spanning from wall to wall. These roof joists overhang $2\frac{1}{2}$ ft. on the track side and 8 ft. on the team side, thus affording a shelter



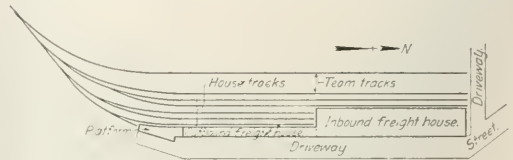
Cross Section of the Inbound Freight House

equivalent to the marquis on the inbound house. The building is stiffened transversely by 3-in. by 3-in. angle irons serving as knee-braces at each panel point.

The outbound house is separated from the inbound house by a rolling steel door arranged for automatic closing by means of a fusible link. At the far or south end of the outbound house a sliding door leads out onto a platform which is used largely for the unloading of automobiles, for which purpose it is provided with an abutting stub track for

end door unloading and an incline for rolling the cars to the roadway level. This platform is also equipped with a crane for unloading heavy machinery and other commodities not readily handled through the freight house.

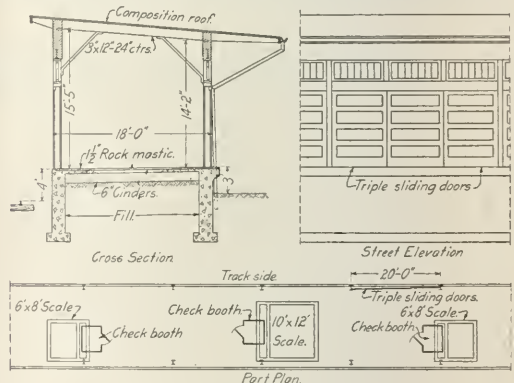
The teamway along the side of the freight house is graded to give a maximum of convenience in the transfer of freight between street vehicles and the house. Along the outbound



Plan of the Station and Tracks

house where the movement is from the wagons to the house, the roadway is only 3 ft. lower than the floor level so that most of the wagon beds or truck beds would be higher than the floor. Along the inbound house where the movement of freight is from the house to the trucks, the roadway is 3 ft. 6 in. lower than the floor so that the floor would be higher relative to the wagons.

The design and the construction of this house was under the general direction of F. L. Stuart, until recently chief en-



Details of the Outbound Freight House

gineer of the Baltimore & Ohio and the Baltimore & Ohio Chicago Terminal. The design was under the immediate direction of M. A. Long, assistant to the chief engineer of the Baltimore & Ohio, and the construction was under the direction of L. G. Curtis, district engineer of the Baltimore & Ohio Chicago Terminal. The contractor was the Drumm Construction Company, Chicago.

ELECTRIC POWER FOR SWISS LINES.—The total Swiss railway system, Federal and other, amounts to 3,216 miles, of which 1,700 miles are Federal and 1,516 miles are owned by corporations. Of the private lines 622 miles are already electrified, but only about 50 miles narrow gage and other of the Federal railways are operated by electricity. Looking to further electrification, the Federal railways already have acquired numerous water-power properties in the valleys of the Reuss, Levantina, Rhone, and in the Trient, Canton Valais, and elsewhere. In all 10 electric water plants are projected, with 500,000 horsepower efficiency. Two of these, the Amsteg and the Ritom works, produce 152,000 horsepower, designed to supply the Gotthard Railway from Lucerne to Chiasso.

Interstate Commerce Commission Enlarged

Priority Bill Passed; Study of Waterway Problem;
Railway Commissioners' Annual Meeting; Income Tax

WASHINGTON, D. C., August 7, 1917.

THE bills to authorize the President to direct that certain shipments shall have preference or priority in transportation during the war, and to enlarge the Interstate Commerce Commission from seven to nine members and authorize it to reorganize its work by divisions were sent to the President for signature on August 6. The Interstate Commerce Commission bill carries a new provision inserted in conference, that until January 1, 1920, no increased rate may be filed without the approval of the commission. The priority bill also carries a provision to prevent obstruction of interstate commerce.

The conference committees, appointed to reconcile the differences between the House and the Senate in the bills, submitted their reports on August 3 and the compromise bills agreed upon in conference were adopted by the House of Representatives on the following day and by the Senate on August 6.

The priority bill as passed contains the provision inserted in the House authorizing the President to issue priority orders direct or through such person or persons as he may designate or through the Interstate Commerce Commission. It also contains the provision of the Senate bill with some changes, authorizing the carriers, without responsibility or liability on the part of the United States, to establish and maintain in the city of Washington during the period of the war an agency empowered by such carriers as join in the arrangement, to receive notice and service of such orders and directions as may be issued. This, of course, refers to the Railroads' War Board, the Executive Committee of the Special Committee on National Defense of the American Railway Association, whose sub-committee, the Commission on Car Service, has the necessary organization for complying with orders to give preference to commodities or special shipments essential for war purposes. Before the bills were originally passed in the House and in the Senate, the proposed provision for compensating the carriers for loss or damage suffered by reason of complying with a priority order had been eliminated, provision being made, however, for the fixing of rates for transportation in carrying out the orders of the President by the Interstate Commerce Commission. The text of the priority bill as passed is as follows:

TEXT OF PRIORITY BILL

"That section 1 of the act entitled 'An act to regulate commerce,' approved February 4, 1887, as heretofore amended, be further amended by adding thereto the following:

"That on and after the approval of this act any person or persons who shall, during the war in which the United States is now engaged, knowingly and willfully, by physical force or intimidation, by threats of physical force obstruct or retard, or aid in obstructing or retarding, the orderly conduct or movement in the United States of interstate or foreign commerce, or the orderly make-up or movement or disposition of any train, or the movement or disposition of any locomotive, car, or other vehicle on any railroad or elsewhere in the United States engaged in interstate or foreign commerce shall be deemed guilty of a misdemeanor, and for every such offense shall be punishable by a fine of not exceeding \$100 or by imprisonment for not exceeding six months, or by both such fine and imprisonment; and the President of the United States is hereby authorized, whenever in his judgment the public interest requires, to employ the armed forces of the United States to prevent any such obstruction or retardation of the passage of the mail, or of

the orderly conduct or movement of interstate or foreign commerce in any part of the United States, or of any train, locomotive, car, or other vehicle upon any railroad or elsewhere in the United States engaged in interstate or foreign commerce: *Provided*, That nothing in this section shall be construed to repeal, modify, or affect either section 6 or section 20 of an act entitled "An act to supplement existing laws against unlawful restraints and monopolies, and for other purposes," approved October 15, 1914.

"That during the continuance of the war in which the United States is now engaged the President is authorized, if he finds it necessary for the national defense and security, to direct that such traffic or such shipments of commodities as, in his judgment, may be essential to the national defense and security shall have preference or priority in transportation by any common carrier by railroad, water, or otherwise.

"He may give these directions at and for such times as he may determine, and may modify, change, suspend, or annul them, and for any such purpose he is hereby authorized to issue orders direct, or through such person or persons as he may designate for the purpose or through the Interstate Commerce Commission. Officials of the United States, when so designated, shall receive no compensation for their services rendered hereunder. Persons not in the employ of the United States so designated shall receive such compensation as the President may fix. Suitable offices may be rented and all necessary expenses, including compensation of persons so designated, shall be paid as directed by the President out of funds which may have been or may be provided to meet expenditures for the national security and defense.

"The common carriers subject to the acts to regulate commerce or as many of them as desire so to do are hereby authorized without responsibility or liability on the part of the United States, financial or otherwise, to establish and maintain in the city of Washington during the period of the war an agency empowered by such carriers as join in the arrangement to receive on behalf of them all notice and service of such orders and directions as may be issued in accordance with this act, and service upon such agency shall be good service as to all the carriers joining in the establishment thereof. And it shall be the duty of any and all the officers, agents, or employees of such carriers by railroad or water or otherwise to obey strictly and conform promptly to such orders, and failure knowingly and willfully to comply therewith, or to do or perform whatever is necessary to the prompt execution of such order, shall render such officers, agents, or employees guilty of a misdemeanor, and any such officer, agent, or employee shall, upon conviction, be fined not more than \$5,000, or imprisoned not more than one year, or both, in the discretion of the court.

"For the transportation of persons or property in carrying out the orders and directions of the President, just and reasonable rates shall be fixed by the Interstate Commerce Commission; and if the transportation be for the Government of the United States, it shall be paid for currently or monthly by the Secretary of the Treasury out of any funds not otherwise appropriated. Any carrier complying with any such order or direction for preference of priority herein authorized shall be exempt from any and all provisions in existing law imposing civil or criminal pains, penalties, obligations, or liabilities upon carriers by reason of giving

preference or priority in compliance with such order or direction.'"

ENLARGEMENT OF I. C. C.

The differences between the bill for the enlargement of the Interstate Commerce Commission, as agreed upon in conference, and the bill as passed by the House, include a substitute for the amendment added by Senator Smith in the Senate, which would require the commission to suspend an advance in rates whenever a protest was made by anybody in the United States. The Senate conferees insisted on this amendment or something equivalent thereto, but an agreement was finally reached on a provision that until January 1, 1920, no increased rate, fare, charge or classification shall be filed except after approval thereto has been secured from the commission. Such approval may, in the discretion of the commission, be given without formal hearing and in such case would not affect any subsequent proceeding. In explaining this provision in the House, Chairman Adamson of the Committee on Interstate and Foreign Commerce, said that this question had involved considerable heated discussion in conference and twice it had been agreed to report a disagreement, but finally it was suggested that a period of time should be allowed before legislating on such an important change. Before agreeing on the substitute finally adopted, he said, the conferees had called before them a representative of the railroads and members of the Interstate Commerce Commission. The representative of the railroads, he said, had no objection to make and both he and the commissioners agreed that the amendment would be workable, because in proposing an increase of rates the railroads will state to the commission what the proposition is and if the commission is not satisfied either from the record or from what it knows of the situation, it will have hearings and then approve or disapprove the rates. But it was stated, Mr. Adamson said, that the commission in many cases could tentatively allow the increase and give the matter further consideration later, if necessary.

Another amendment was adopted for the purpose of providing for rehearings by the commission on cases decided by subdivisions of the commission, as provided in section 16a of the act itself for rehearing cases decided by the commission.

It was provided that in proceedings before the subdivisions relating to the reasonableness of rates or to alleged discriminations no less than three members shall participate and in proceedings relating to valuation not less than five members shall participate.

The provision in the original bills, as introduced, for an increase in the salary of the secretary of the commission was not adopted and the salary is specifically fixed at \$5,000. The text of the bill as passed is as follows:

"That section 24 of an act entitled 'An act to regulate commerce,' approved February 4, 1887, as amended, be further amended to read as follows:

"Sec. 24. That the Interstate Commerce Commission is hereby enlarged so as to consist of nine members, with terms of seven years, and each shall receive \$10,000 compensation annually. The qualifications of the members and the manner of the payment of their salaries shall be as already provided by law. Such enlargement of the commission shall be accomplished through appointment by the President, by and with the advice and consent of the Senate, of two additional Interstate Commerce Commissioners, one for a term expiring December 31, 1921, and one for a term expiring December 31, 1922. The terms of the present commissioners, or of any successor appointed to fill a vacancy caused by the death or resignation of any of the present commissioners, shall expire as heretofore provided by law. Their successors and the successors of the additional commissioners herein provided for shall be appointed for the full term of seven years, except

that any person appointed to fill a vacancy shall be appointed only for the unexpired term of the commissioner whom he shall succeed. Not more than five commissioners shall be appointed from the same political party.'

"Sec. 2. That section 17 of said act, as amended, be further amended to read as follows:

"Sec. 17. That the commission may conduct its proceedings in such manner as will best conduce to the proper dispatch of business and to the ends of justice. The commission shall have an official seal, which shall be judicially noticed. Any member of the commission may administer oaths and affirmations and sign subpoenas. A majority of the commission shall constitute a quorum for the transaction of business, except as may be otherwise herein provided, but no commissioner shall participate in any hearing or proceeding in which he has any pecuniary interest. The commission may, from time to time, make or amend such general rules or orders as may be requisite for the order and regulation of proceedings before it, or before any division of the commission, including forms of notices and the service thereof, which shall conform, as nearly as may be, to those in use in the courts of the United States. Any party may appear before the commission or any division thereof and be heard in person or by attorney. Every vote and official act of the commission, or of any division thereof, shall be entered of record, and its proceedings shall be public upon the request of any party interested.

"The commission is hereby authorized by its order to divide the members thereof into as many divisions as it may deem necessary, which may be changed from time to time. Such divisions shall be denominated, respectively, division 1, division 2, etc. Any commissioner may be assigned to and may serve upon such division or divisions as the commission may direct, and the senior in service of the commissioners constituting any of said division shall act as chairman thereof. In case of vacancy in any division, or of absence or inability to serve thereon of any commissioner thereto assigned, the chairman of the commission, or any commissioner designated by him for that purpose, may temporarily serve on said division until the commission shall otherwise order.

"The commission may by order direct that any of its work, business, or functions arising under this act, or under any act amendatory thereof, or supplemental thereto, or under any amendment which may be made to any of said acts, or under any other act or joint resolution which has been or may hereafter be approved, or in respect of any matter which has been or may be referred to the commission by Congress or by either branch thereof, be assigned or referred to any of said divisions for action thereon, and may by order at any time amend, modify, supplement, or rescind any such direction. All such orders shall take effect forthwith and remain in effect until otherwise ordered by the commission.

"In conformity with and subject to the order or orders of the commission in the premises, each division so constituted shall have power and authority by a majority thereof to hear and determine, order, certify, report, or otherwise act as to any of said work, business, or functions so assigned or referred to it for action by the commission, and in respect thereof the division shall have all the jurisdiction and powers now or then conferred by law upon the commission, and be subject to the same duties and obligations. Any order, decision, or report made or other action taken by any of said divisions in respect of any matters so assigned or referred to it shall have the same force and effect, and may be made, evidenced, and enforced in the same manner as if made or taken by the commission, subject to rehearing by the commission, as provided in section 16a hereof for rehearing cases decided by the commission. The secretary and seal of the commission shall be the secretary and seal of each division thereof.

"In all proceedings before any such divisions relating to the reasonableness of rates or to alleged discriminations not

less than three members shall participate in the consideration and decision and in all proceedings relating to the valuation of railway property under the act entitled "An act to amend an act entitled 'An act to regulate commerce,' approved February 4, 1887, and all acts amendatory thereof, by providing for a valuation of the several classes of property of carriers subject thereto and securing information concerning their stocks, bonds, and other securities," approved March 1, 1913, not less than five members shall participate in the consideration and decision.

"The salary of the secretary of the commission shall be \$5,000 per annum.

"Nothing in this section contained, or done pursuant thereto, shall be deemed to divest the commission of any of its powers."

"Sec. 3. So much of section 18 of the act to regulate commerce as fixes the salary of the secretary of the commission is hereby repealed.

"Sec. 4. That paragraph 2, section 15, of the act to regulate commerce approved February 4, 1887, as amended, be further amended by adding the following: 'Provided further, until January 1, 1920, no increased rate, fare, charge, or classification shall be filed except after approval thereof has been secured from the commission. Such approval may, in the discretion of the commission, be given without formal hearing, and in such case shall not affect any subsequent proceeding relative to such rate, fare, charge, or classification.'"

COMMISSION FOR COMPREHENSIVE STUDY OF WATERWAY PROBLEMS

The River and Harbor appropriation bill passed by Congress last week contains a provision for a waterways' commission of seven members to bring into co-ordination and co-operation the engineering, scientific and constructive services, bureaus, boards and commissions of the several governmental departments of the United States and commissions created by Congress that relate to the study, development or control of waterways and water resources and subjects relating thereto, or to the development and regulation of interstate and foreign commerce, with a view to uniting such services in investigating with respect to all watersheds of the United States all questions relating to the development, improvement, regulation and control of navigation as a part of interstate and foreign commerce. The investigation is to include the related questions of irrigation, drainage, forestry, reclamation, etc., the co-operation of railways and waterways, and promotion of terminal and transfer facilities. The commission is to secure the necessary data and formulate and report to Congress as early as practicable a comprehensive plan or plans for the development of the water resources of the United States for the purposes of navigation and for other useful purposes, and recommendations for the modification or discontinuance of any project heretofore adopted. The commission is to be appointed by the President and at least one of its members shall be chosen from the active or retired list of the engineering corps of the army. At least one shall be an expert hydraulic engineer and the remaining five may be selected either from civil life or the public service. The commission is authorized to employ experts for its investigation and for its expenses the sum of \$100,000 is appropriated.

STATE COMMISSIONERS TO CONSIDER WAR TIME TRANSPORTATION

The effect of the war on various problems pertaining to railroad transportation and its regulation is to be the principal topic for discussion at the twenty-fifth annual convention of the National Association of Railway Commissioners to be held in Washington beginning on October 16, according to the announcement of the meeting just issued. The

association is composed of members of state railroad and public utility commissions and the Interstate Commerce Commission.

Active co-operation of the association "in the matter of federal control over operation of railroads to meet military and industrial requirements" will be among the subjects to be discussed.

"The time calls imperatively for unified action by all men charged with public responsibility," the announcement said. "At this convention the present vital problem of public utility regulation, including the public utilities' function in serving the nation's need, the requests of railroads and other public utilities for increases in rates and for authority to diminish or discontinue service and the requests of the public for reasonable rates and more adequate service, will be fully discussed with a view to uniform, constructive action by the various states and federal regulatory commissions."

INCREASE IN INCOME TAX PROPOSED

The revised war revenue bill intended to raise \$2,000,000,000 in taxes during the ensuing year was reported to the Senate on August 6 by the Finance Committee, which has been working on the bill since it was passed by the House in May. The provision for a corporation income tax, which the committee expects will raise \$162,000,000 was modified to increase the normal income tax from 4 per cent to 6 per cent on net income. The committee also decided to reduce from 15 per cent to 10 per cent the tax rate on undistributed surplus and to exempt from this tax the undistributed surplus actually invested or employed in business or retained for employment in the reasonable requirements of the business.

PHOTOGRAPHING STANDARD PLANS

By J. G. Wishart

Office Engineer, C. R. I. & P., Chicago, Ill.

Standard plans have been regarded as a necessity by railroad organizations for many years and many economies have been effected by their adoption and use. However, they should be gotten out in a form that can be conveniently handled, and this is generally accomplished by reducing the copies intended for general distribution to a small size. There are several processes of accomplishing the reduction. One method, adopted by several railroads, is the zinc etching process, but there are objections to this method which detract somewhat from its desirability. To obtain a low unit cost a large number of copies of each plan must be purchased and as standards are being revised continually and a change of any kind in a standard destroys the usefulness of all copies made prior to the revision many of the copies may become worthless. Another drawback to this system is the large amount of space required to store a supply of the prints and the zinc plates.

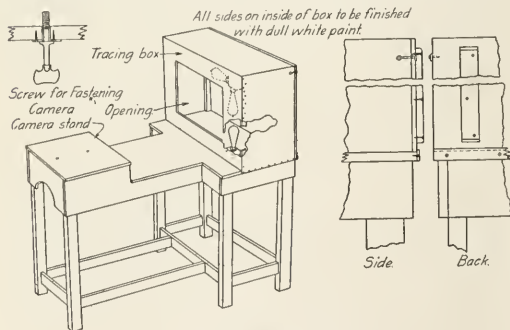
Probably the most economical method of producing the reduced size prints is to photograph the original tracing on a film and make blue line prints from the negative. The initial cost of the negative is low as compared to zinc or other plates, the cost of blue line prints in small quantities is less than that of printed copies from other processes, and only a small amount of filing space is required for storing the negatives and a sufficient number of prints to supply current demands.

To obtain the full economy of the photographic method, the negatives should be made by the regular employees of the engineering department rather than a professional photographer. Anyone with any experience in amateur photography can produce first-class results by following the procedure in use in the engineering department of the Chicago, Rock Island & Pacific, which is outlined below. The prime requisite of the photo method is to obtain clear

cut, fast printing negatives suitable for blue printing in an electric printing machine. It was only after several months of experimenting that the method adopted was worked out successfully.

The size of a standard tracing on the Rock Island is 24 in. by 36 in. and for convenience in handling in correspondence a width of 8 $\frac{1}{4}$ in. was adopted for the smaller prints, making the length 12 in. A special size film 9 in. by 14 in. coated with process emulsion was obtained from one of the large photographic supply companies which reduced the waste on films to the minimum. This film is especially adapted for copying black line drawings and when properly exposed and developed produces a clear cut fast printing negative which can be run through a continuous electric blue printing machine along with ordinary tracings to produce first class prints on the ordinary grade of blue print paper. When printed in this way these negatives can be used to fill in vacant spaces left by odd sized tracings and make use of what otherwise would be waste blue print paper.

Next in importance is the equipment for photographing. Any first class view camera of sufficient size fitted with an anastigmat lens will suffice. The equipment used on the Rock Island consists of an 11 in. by 14 in. Improved Empire State view camera, fitted with a Turner-Reich Anastigmat, F 6.8, series 11, No. 5 lens mounted in a compound shutter. It is mounted on a table to which the illuminating box is attached as shown in the sketch. The latter is designed to



Photographing Table

throw the proper amount of light, evenly distributed, on the tracing during the exposure of the negative and is designed to accommodate the standard size tracings. The back of the box consists of a perfectly flat board reinforced to prevent warping and made removable. The tracings are mounted on this board while being photographed. The opening in the front of the box is just large enough to permit the lens to cover the entire back of the box when in focus for a negative 9 in. wide. The entire inside of the box is painted a flat white. The lights, ten 100-watt tungsten lamps, are mounted inside the box around the opening in the front and reflectors placed behind them give a uniform illumination over the entire surface of the tracings. In consequence all negatives are of equal density from which prints of equal tone can be made with the same length of exposure. The advantage of this can readily be appreciated as it permits a number of negatives being run through the blue print machine at the same speed. The results obtained with this box are so far superior to those with natural light that there is no comparison. The variation in the intensity of natural light is so great at different times of the day and under varying weather conditions that it is next to impossible to get uniform or even satisfactory negatives, unless an expert is employed to do the work.

A necessary adjunct of this work is the darkroom and

owing to a lack of unused space it was necessary to be content with a room 10 ft. square. The camera stand is located in the darkroom, enabling the entire operation of exposing and developing to be completed in the one place. It is equipped with shelves, a cabinet for storing supplies, a built-in table for developing and a sink with running water for washing films and prints. The window is in the north wall and is fitted with a sliding panel to permit daylight printing of photo paper prints when desired. This can also be utilized for lighting the room when not exposing or developing.

Complete equipment is not the only factor in obtaining results. The exposure and development of the film are of equal importance. Focusing for the exposure must be done carefully. It will pay to make frequent use of a magnifying glass to examine the distinctness of the image on the ground glass as each line must show up clear cut. With ten 100-watt Tungsten lamps in the illuminating box, an exposure of 12 sec. through an F-16 orifice has been found sufficient for new and unsoiled tracings, while exposure ranging up to 20 sec. will be necessary for old and soiled tracings, depending upon their condition. With the process emulsion film the following formula for the developer is giving perfect satisfaction:

Sulphite of soda	9	oz.
Carbonate of soda	6	oz.
Hydroquinon	1 $\frac{1}{2}$	oz.
Bromide of potassium	$\frac{1}{4}$	oz.
Water	60	oz.

The above formula is for a stock solution: to develop dilute this with equal parts of water and add $\frac{1}{2}$ oz. of a 10-per cent potassium bromide solution to 8 oz. of the developer when ready for use. With a correct exposure 20 min. development in this solution will produce a film of proper density. After the development is complete the film should be fixed in an acid-fixing bath prepared as follows:

Solution A.		
Pure water	96	oz.*
Hypo (crystals)	2	lbs.
Sulphite of soda	2	oz.
Solution B.		
Pure water	32	oz.
Chrome alum	2	oz.
Sulphuric acid, C. P.	$\frac{1}{4}$	oz.

*Avoiddupois weights.

In mixing the fixing solutions be sure that the chemicals are entirely dissolved, then pour solution B into A slowly while stirring .1 rapidly. This bath will fix a large number of negatives and when exhausted should be discarded. Never attempt to restore it by adding hypo. Negatives left for a long time in this bath harden and are more durable. During development the developing solution should not be permitted to get warmer than 65 deg. F. In a first class negative, the lines should be absolutely clear after fixing and when laid on a sheet of white paper should show white.

Films have the advantage over glass plates that they can be blue-printed in a machine, and occupy only a small space for filing and storing. The filing case in the Rock Island office will accommodate 260 films together with about 30 prints of each and occupies a floor space of only 15 in. by 3 ft. 4 in. The photographer is charged with the duty of keeping a supply of prints of each negative in this case at all times in order that requests for them may be filled as soon as received.

The economy of installing a complete outfit as described above depends on the amount of work to be done. At the present cost of material, the saving on 500 film negatives alone, which would cost about \$2.50 each if made by a professional, should pay for the complete equipment. In addition to this there is the saving in the amount of blue printing as these small sized prints can be made to serve the purpose on a majority of the requests for prints of standard plans. With the normal price of blue print paper this item is well worth consideration.

Operating Men Discuss Use of the Overlap

Provision of Two Stop or Two Caution Signals Behind Trains Not Generally Favored Except for Special Cases

SINCE there is no such organization as the Association of Operating Vice-Presidents, that title will serve as well as any other to designate a group of prominent railway executives who recently discussed in some detail the practice of providing two stop or two caution signals in the rear of a train by the arrangement which in automatic signal control circuits is commonly termed the overlap. In addition to the 45 operating officers in this fictitious organization, the discussion was participated in by several signal engineers in the role of expert witnesses and by one government officer with considerable experience in signaling and the investigation of accidents. On account of its imaginary character, the A. O. V. P. was able to go further than any of the other railway organizations in conducting its work without a meeting, all discussions being submitted in writing to one individual who prepared the proceedings in the form which they might have assumed if the 50 or more men who participated had actually been gathered in one room. While the following, therefore, is the fictitious report of an imaginary meeting, the facts presented are none the less real, and the opinions expressed are from some of the best known operating men in the country.

PRESIDENT.—As the call for this meeting was limited to the representatives of 56 companies which make considerable use of block signals, the large attendance indicates very clearly the importance of the subject announced and the interest you have in it. The chairman of the program committee is responsible for the selection of the subject as he was recently led to investigate the matter very fully in connection with an unfortunate collision on his road resulting from an engineer over-running a stop signal. He convinced the officers of the association that while it may seem a rather technical matter to come before this organization, it is one which, in the interest of safe operation, we should know more about. As I have no doubt the details of the subject are somewhat hazy in your minds, as they were in my own when it was first presented to me, I have taken the precaution to invite a signal engineer, known to many of you, to state briefly the principle of the overlap and its relation to other operating problems.

SIGNAL ENGINEER.—The overlap in signaling simply means the extension of the control of a signal to some point beyond the next signal in advance, or, in other words, the control circuits are overlapped. The principle was very early used in automatic signaling when only two indications, stop and proceed, were given, to render unnecessary the provision of a separate distant signal to warn an engineer that a stop would be required at the next signal in advance. Under this system, a train passing signals A, B and C in the order named would not only hold signal B at stop while in the block from B to C, but it would also hold signal A at stop until it passed C. Thus a following train encountering a stop signal would have a full block length in which to stop after passing the signal.

When automatic signaling came to be applied to single-track lines, the overlap played an important part in providing adequate protection against opposing movements. Also, in recent years, in the signaling of dense traffic lines, on which there are exceptional hazards in case of collision, such as subways, elevated lines, electrified terminals, etc., the overlap has been frequently used in addition to distant signals, and in some cases in addition to automatic stops. Some roads overlap the stop signal under much less exacting conditions than those mentioned, but the majority of

roads are against this practice. Others which oppose the overlapping of the stop signal on the ground that adequate advance information can be provided in the signal system, find occasion sometimes to overlap the caution or distant signal or to use the so-called three-block system of indication which is one of the schemes provided for in the A. R. A. standard code. Under this latter scheme the first signal behind a train indicates Stop; the second, Prepare to stop at next signal, and the third, Approach the next signal at limited speed.

For your purpose the subject can be narrowed down considerably. It may be conceded at once that the overlap is necessary in old installations, a few of which are still in service, where no distant indications are provided, since without such indications the engineer cannot be held strictly responsible for stopping at a stop signal, although there is always the possibility of a train standing immediately ahead of the signal. It is also obvious that the overlap is necessary in single-track automatic signaling where this feature for following movements is secured incidentally in the provision of adequate protection against butting collisions. Further, in subway signaling, or under conditions approaching those of subway operation, every possible special provision is warranted, and there is little ground therefore for argument as to the use of overlaps in such cases. The grounds on which there may be differences of opinion regarding the use of the overlap can be divided into three general parts: First, the overlapping of stop signals to provide at least two stop and one caution signals behind a train on a line of normal traffic; second, the overlapping of caution signals to provide one stop and two or more caution signals behind the train, or the alternative use of three-block indications; and third, means for preventing collisions caused by failure to obey signal indications in the absence of such a precaution as overlapping.

PRESIDENT.—The subject has now been introduced and outlined. In order to get the most out of the discussion, I suggest that it will be best to take up the three general topics in their order.

THE USE OF TWO STOP SIGNALS

V. P. 32.—As a representative of a road using the overlap, I am glad to open this discussion. There are two general conditions under which accidents caused by over-running a danger signal are likely to occur, and which require special attention in the installation of automatic signal protection: First, when dense traffic or adjacent interlocking plants require the spacing of home signals less than braking distance apart; and second, when conditions require the location of a signal a short distance in the rear of a water tank, station, or other point where trains stop. Our first endeavor in such cases is to provide a liberal distance—say 800 to 1,500 ft.—from the signal in advance, or the point to be protected to the next signal in the rear. In addition, we generally provide an overlap and when by both of these measures a safe stopping distance has not been obtained, we add the feature of repeating the caution indication at the next signal in the rear. We have had an entirely satisfactory experience with the overlap. We recognize the necessity for safeguarding against human error. We, therefore, believe in immediate obedience to signal indications, but with a factor of safety to guard against a mistake. The overlap provides such a factor.

V. P. 28.—We all recognize the conditions just mentioned but on our road, we do not meet them in the way that has

just been outlined. Our practice is to locate the home signal a minimum distance of 500 ft. in the rear of the point we desire to provide special protection for, although in some cases conditions are not favorable to obtain this minimum distance and we have to be satisfied when we come as near it as possible. We do not, however, overlap the stop position of our signals, as we admit of no reason for carrying the control of the stop indication beyond the limits of the block over which the signal governs. The men who are to be guided by the signal must be educated that it is imperative to stop before passing a signal at stop. To overlap the stop control is an invitation to the men to regard the stop indication less positively.

V. P. 36.—While we do not use the overlap except on districts where one-arm two-position automatic signals are still in use, it is largely because the expense is not thought to be warranted, as we do not have high-speed passenger trains with the frequency obtaining on some other lines. We consider the overlap an important adjunct, however, on both the home and distant and the three-position systems of signaling on roads with a dense passenger movement and high-speed trains following each other closely.

S. E. 33.—We do not use the overlap except in one large terminal and personally I am strongly of the opinion that it cannot be justified except under conditions of that kind. If the giving of one more chance to an engineman would insure his obeying a second indication, good reasons might be advanced in favor of the overlap. But in many accidents caused by overrunning signals, there was full braking distance between the stop signal and the standing train, thus reproducing the conditions of an overlap, showing that little or no additional safety is secured by its use. Those who advocate the overlap may also fail to take into consideration the complications which are met in interlocking plants and the impracticability of providing complete overlapping protection, especially when it is endeavored to overlap the protection for switches.

V. P. 22.—In our estimation, signaling in territory where the speed is high and train service frequent, requires an overlap to give the maximum degree of safety. This is on the same principle that a space is always provided between a home interlocking signal and the derail ahead of it.

V. P. 37.—I know that our signal engineer has some views in direct contrast to those expressed by the last speaker, and I am going to ask him to say a few words.

S. E. 37.—I think the overlap is not only unnecessary, but dangerous. As stated before, it is impossible to provide it in all cases, and to have overlaps at some places and not at others, would make for unsafe conditions, as it does not take long for engineers to find out that the overlap is used and this has a tendency to cause them to pay less attention to the signal indications than if they knew that the block ends at each signal. If an engineer cannot be made to stop at a home signal, it is a foregone conclusion that he cannot be made to stop at the end of an overlap where there is no indication to mark the point.

V. P. 9.—In general, I would agree with the signal engineer, but our practice is to use the overlap in some special cases. First, on portions of our signal system which are old, and on which no approach information is given, each stop signal is overlapped to a point braking distance beyond the next stop signal. In the second place, we have a few points where a stop signal had to be located at the approach end of a station platform, and in these cases an overlap the length of the platform was installed, this length never being over 500 ft. however.

V. P. 15.—We have a practice on single track somewhat similar to that referred to by V. P. 9. We overlap the control of the second signal on each side of stations for a distance of 800 ft. While the train is in this 800-ft. zone, it is protected from the rear by one caution and two stop signals.

After it passes out of this zone it is protected in the rear by one caution and one stop signal, the same as at other points.

V. P. 7.—In all cases where we do not have distant signals or three-position signals, we use an overlap varying in length from 2,000 to 3,000 ft. depending on local conditions. There are so many places in the country where this is desirable that it does not seem to me the overlap should be condemned. I know that there are many roads which have not been represented by previous speakers on which the overlap is used. The latest block signal statistics of the Interstate Commerce Commission, dated January 1, 1917, show a total of 16,671.2 miles of road, on which automatic signals are overlapped. As this is slightly more than 50 per cent of the total automatic block signal mileage in the country, it would indicate that the overlap is still held in considerable favor by American railways.

V. P. 39.—Replying to the quotation of statistics just made, I would like to correct the impression made. The table referred to also shows 19,403 miles of track on which overlapped automatic signals are in service, or only 2,731.8 miles more than the figures for miles of road. This indicates very plainly therefore that the large mileage of overlapped signals is due to the large mileage of single-track automatic signaling which is in service, and on which, as previously explained, the overlap is essential primarily for head-on protection.

V. P. 13.—There is another possible source of error in the figures referred to. I had occasion recently to check the report from my own road and found that we had reported a considerable double-track mileage as overlapped on the interpretation of the I. C. C. request as covering the clear indication of our three-position signals, the control of which extends beyond the signal in advance. I am now convinced that this interpretation was not correct.

V. P. 39.—As to the favor in which the overlap is held by American railways, I believe the signal engineers of the country are in a good position to speak with authority. A committee of the Railway Signal Association, considering this subject, presented a report to the two stated meetings of that association this year, in which it was stated "Overlaps are undesirable for following movements, as adequate advance information can be provided in the signal system." My personal opinion is that overlaps, whether resulting in two stop signals and a caution signal, one stop signal and two caution signals, or five or six stop signals and five or six caution signals are pernicious, although the committee has not made the statement quite so emphatic. I would also bring to your attention as operating men, the self-evident fact that no signal system can be successfully designed and no set of rules properly formulated which are predicated on disregard of the signal indications and violations of the rules.

PRESIDENT.—It seems evident that the majority of opinion as to the overlapping of stop signals is against the practice. I would suggest that we pass to the overlapping of the caution indication, or the double distant as it is frequently called, and any further facts on the general question can be brought out when we turn to a consideration of substitutes.

THE USE OF TWO CAUTION SIGNALS

V. P. 28.—While, as stated before, we do not overlap the stop position of our signals, we do in special cases overlap the caution position, this being done where there is less than braking distance between home signals or on steep down-grade grades where the alignment is very crooked. As a rule, we do not favor the double-caution indication but there may be special local conditions that make it advisable.

V. P. 9.—We also follow the practice of giving additional approach information when two stop signals are less than braking distance apart, but it is important to explain in connection with such a practice that we never give the in-

dication, "Approach the next signal prepared to stop," at a greater distance from the stop signal than we can reasonably expect a man to remember it. Our established basic distance in high-speed territory is one mile, and the maximum distance is 7,500 ft.

V. P. 13.—Wherever conditions require the spacing of signals less than braking distance apart such as may be necessary at interlocking plants, we carry back the caution indication to the second signal in the rear so that when the signal furthest in advance is at stop, it will be preceded by two caution signals. This arrangement insures stopping distance between the first caution signal and the stop signal.

V. P. 14.—We have recently installed the double-distant system in suburban territory where the blocks are short, and we believe that the caution indication should be carried back to the second block under conditions of this kind.

V. P. 39.—I am personally as much opposed to overlapping the caution indication as the stop indication. Properly designed signal systems provide full braking distance at authorized maximum speeds, either by spacing the signals full braking distance apart, or where this is impossible, providing what is called three-block indications. If the information given by these signals is observed, protection for fast trains and facility for all trains is provided.

V. P. 28.—I rather anticipated some criticism on my former statement that we use double-distant indications on down grade. We know there are arguments against this practice, but we feel that it is justified. The two principal arguments against it are that enginemen will not strictly observe the indication, and that the speed of a train on such a grade should be such that it can be brought to a stop before passing the home signal upon receiving one caution indication. The first reason should not be countenanced at all as it is an admission of weak operating practice. The second is better, but, after all, this is a matter which should be decided according to the operating requirements. Where conditions are favorable to the use of double-caution indications, enginemen may be given valuable information to assist in the proper control of their trains providing they are first taught to observe signal indications strictly.

V. P. 33.—The use of two caution signals is no more consistent than the use of two stop signals. If a caution signal cannot be placed at braking distance from the stop signal, the second signal in the rear should be made to display the indication, "Approach next signal at restricted speed," as covered in the A. R. A. code.

V. P. 1.—While we do not have as large a mileage of automatic signals on our road as many others, I do not recall any instance where the spacing of the home signals is less than braking distance apart, and as a general thing, therefore, I do not see that overlapping is necessary.

V. P. 34.—I am inclined to agree with the previous speaker. In practically all cases the difficult situations which have been referred to can be taken care of by the proper location of signals, and if necessary, the rearrangement of tracks or other facilities. Proper results may not always be obtained by designing a signal system to fit existing facilities, but there is no reason why, in many instances, the facilities cannot be rearranged to fit the desirable signal system.

V. P. 43.—There is undoubtedly truth in the statement that a rearrangement of tracks and facilities will solve some problems in the protection of traffic more easily than adding safeguards in the signal system. It is a very difficult matter to rearrange crowded interlockings in terminal areas, however, and it has been my experience that in such territory there are frequent cases where the first distant signal in the rear of a home is less than braking distance from it. It is our invariable practice in such cases to carry back the distant indication to the second signal in the rear. It would also be impossible to effect any rearrangement on dense-

traffic high-speed suburban lines where the blocks must be kept of a shorter length than braking distance.

PRESIDENT.—We have heard many conflicting opinions, and while it seems evident that the majority do not consider the overlapping of signal circuits to be the ideal system, some hold tenaciously to the view that the overlapping at least of the caution indication is justified under special conditions. It will be interesting to know what measures are relied upon by those who do not admit the necessity of overlapping for the prevention of collisions in case an engineman over-runs a stop signal.

PREVENTING COLLISIONS WITHOUT OVERLAPS

V. P. 4.—We safeguard against rear collisions just beyond home signals by placing the responsibility for such collisions solely up to one man—the engineer. Our rule 505 reads as follows: "An engineer of a train entering a block as provided by block signal rules 504, 505-a and 504-b will be held responsible in case of accidents caused by meeting an opposing or by overtaking a preceding train by an open switch or by obstructed or broken tracks." Our rules make it plain that the train must be stopped before reaching the stop signal. We believe that maintaining strict discipline is better than providing overlaps. We believe further that overlaps are a trap for the engineman, for by their use we say to him when the signal indicates stop: "You must stop before reaching it, but if you do not, nothing will happen because we have provided protection for you in case you run by the signal." With distant signals and no overlaps, we tell the engineman that having the advance information he must stop before reaching the home signal or pay the penalty. Consequently, he stops and there is no penalty to pay.

V. P. 5.—If a following train observes the stop indication it is not material whether the distance between the signal and the rear end of a preceding train is long or short. What is needed is absolute observance of the stop signal. It is not material for what cause the signal appears at stop. It may be due to defective apparatus, and the track may be in perfect condition for the following train to proceed, nevertheless the stop must absolutely be made. The moment you permit trains to ignore the stop indication for any cause or at any speed, you introduce a dangerous condition because it is only a question of time when this bad practice will result in a train passing a signal with a track obstruction close ahead. The theory of overlapping blocks is predicated on trains running by signals in the stop position and in practice the overlap begets that careless condition.

V. P. 19.—In common with many other roads we use surprise tests extensively in insuring the proper observance of signals. Our rule governing the observance of caution signals is as follows: "Enginemen finding a distant signal at caution must immediately bring their trains under control and be prepared to stop before reaching the home signal." In checking them on the observance of signals, we make no exceptions and no allowances for an engine at any time under any circumstances to go beyond the home signal at stop. We undertake to instill thoroughly in the minds of all our engineers that a caution signal means that the train must be immediately brought under control prepared to stop before reaching the next signal.

V. P. 26.—We have a rule which is somewhat special on this point and might be of interest to others. It reads as follows: "Trains must not stand on curves or at a point where the view is obstructed where it can be avoided. When a train enters a block controlled by automatic signals and is stopped for reasons other than signal indication, if it is known that the train cannot be advanced so that the rear end will stand at least 1,000 ft. beyond the home signal, the rear of the train should not be moved clear of the home signal. If, however, the rear of the train is moved clear of

the home signal, it must advance as far as possible in the block."

V. P. 35.—We have also tried to make our rule for the observance of distant signals very concrete. The instructions to the enginemmen and trainmen are as follows: "Reduce speed at once and proceed with caution."

V. P. 9.—The most satisfactory method we have ever found of educating our men in the aspects and indications of the signals, is the use of an instructor. This man, traveling in a signal instruction car, is on the road constantly, informing our men as to how they can and must control their trains to secure the greatest good as well as the greatest protection from the information given by the signals. This education has not only given the men a better understanding of the signals and their meanings than can be obtained either from the book of rules or from the explanations ordinarily given by the officers, but also has given the men absolute confidence in the signals.

V. P. 28.—It is our opinion that the bad wrecks which have occurred on account of over-running home signals at stop are not so much the result of improper signaling, as of the improper observance of the caution indication. The elimination of the "proceed with caution" indication in the recently adopted A. R. A. code rules is a decided step away from safe practice. The retention of this indication and the strict observance of it by enginemmen will effect a cure, and a revision of the code rules to recognize this most important indication in the same simple every-day language that we all have known for many years and that all can understand, is earnestly waited for.

I. C. C.—In the consideration of numerous train accidents brought before the Interstate Commerce Commission, I have given the subject of overlapping automatic signals considerable study. I have been very much interested in the discussion, and as a visitor, would like to say a few things: First, it should be emphasized that the overlap is not a new thing in signaling. It is one of the oldest principles in the art. As has been clearly brought out in the discussion, it has been largely done away with in general practice and is now used principally for special conditions. The roads, as a whole, however, have not entirely eradicated the idea of giving enginemmen a second chance. We are all doubtless agreed on the principle that we should stand firmly on the ground of absolute obedience to signal indications properly given. Any deviation from this course means disaster. I confess, however, that it is somewhat difficult to be inflexible in this position in the face of repeated collisions on roads with good signal installations and with discipline which is apparently as near perfect as it can be made. It should be pointed out further, that the use of the overlap to meet this condition is only a half-way measure. As one officer has stated, there is no assurance that if a man passes the signal at stop he will not also pass the end of the overlap. Whether we are willing to admit it or not, the only remedy which strikes directly at the root of this evil is the automatic stop. I appreciate fully the difficulties of perfecting such automatic devices for general service, but I am convinced that the roads of the country must bend every energy toward an early development of some such device if they are to meet squarely the responsibility resting on them in this matter.

V. P. 33.—With all due regard to the former speaker, I cannot agree with him. From the standpoint of an operating officer it is evident that a greater return may be secured in the elimination of accidents and in safeguarding the movement of trains, by extending automatic block signals rather than by providing overlaps or compelling the introduction of train control devices.

V. P. 2.—In agreeing with the last speaker I would point out that in my opinion if signal systems are properly installed with caution indications at a sufficient braking distance from the stop signals, and if the rules are strictly ob-

served, the results will be as near perfect as human ingenuity can make them.

PRESIDENT.—If there is no further discussion, the subject is closed. As we hoped, many diverging opinions have been brought out. There would be no good purpose gained in taking action on the matter, but I am sure we have all been profited by the exchange of opinions and each of us can form our own conclusions and act upon them.

AN AUTOMATIC AIR DUMP CAR

Among interesting developments in heavy and high capacity dirt and rock handling equipment may be mentioned the automatic air operated steel dump cars built by the Orenstein-Arthur Koppel Company of Koppel, Pa. The illustrations show cars of the Missabe type built for the Oliver Iron Mining Company according to Master Car Builders' and Interstate Commerce requirements. These cars are entirely automatic, being operated by compressed air from pump and operating valves on the locomotive. They may be operated individually from each car and may be dumped all to one side or part to one side and part to the other.

The body of each car is held in its normal load-carrying position by a locking device and supported in this position by bolsters which hold the body securely in four places. There are two dumping cylinders located in the middle of each car, one on each side of the center sill. When air is admitted to the cylinder for dumping, the first few inches



Car in Upright Position

of travel of the piston releases the locking device on one side of the car, and the further travel of the piston dumps the body. A distinctive feature is the automatic air cut-off controlled entirely by the movement of the body. When the load is heaped to one side or when other conditions make the dumping easy, very little air is required to operate this car, and cases have been noted where the car was dumped and the air shut off before the piston made one-half its travel. The saving in air thus afforded eliminates the necessity for individual air reservoirs on the cars.

Another feature is the locking device which projects outside the body bolsters, where it is open to easy inspection and is free from danger of becoming inoperative because of snow, ice, dirt, etc. All valves are standard Westinghouse plug cocks proof against freezing weather, and possibility of accidental dumping from leaky valves is eliminated through a construction which holds the cylinder cocks wide open at all times when the bodies are in the normal load carrying position.

LONDON'S COAL.—The amount of coal brought to London during the first five months of 1914 was: Rail-borne, 3,369,518 tons; and sea-borne, 3,657,090 tons. During the corresponding period for 1917 it was 4,571,306 tons rail-borne, and 2,560,082 tons, sea-borne.

CONVERSION OF CONSOLIDATION TYPE LOCOMOTIVES TO EIGHT-WHEEL SWITCHERS

By F. J. Carty

Mechanical Engineer, Boston & Albany, Boston, Mass.

Because of heavy freight traffic in the early part of 1916, and because of the increase in train loads, it became apparent that more powerful switching locomotives were required on the Boston & Albany to handle quickly and efficiently the heavy trains brought to terminal yards by Mallet and Mikado type locomotives. In order to switch such trains properly, it is essential that the switching locomotive have a tractive effort at least equal to that of the road locomotives, and the design should permit of quick operation.

A study of the governing conditions convinced us that it would be difficult to develop a six-wheel switcher which would satisfactorily meet the requirements of the service, and it was therefore decided to build switchers of the eight-wheel type having adequate tractive effort without excessive axle loads. As the cost of materials entering into the construction of locomotives was much above normal prices, we found that a considerable saving could be made by converting Consolidation type locomotives into 0-8-0 type switchers.

The Consolidation locomotives selected were built in 1901, having a tractive effort of 37,190 lb., 20-in. by 32-in. cylin-

running gear, the driving wheel base was maintained at 17 ft., but it was necessary to cut off the front section of the frames because of the removal of the engine truck.

These changes in design made it necessary to recalculate the "live" loads in order to bring the center of gravity of the locomotive in a vertical plane midway between the main and intermediate drivers. It may be of interest to outline the method followed to determine the correct position of the boiler.

The "dead" loads, consisting of driving wheels, engine truck wheels, boxes, cellars, bearings, axles, crank pins, eccentrics and the proportionate weights of main and side rods, were assumed to be concentrated at each axle. One-third the weight of the main rod, and one-half the weight of the eccentric blades were assumed to be carried at the main driving wheels. Subtracting the dead loads from the known distributed weights gives the live load at each wheel.

By taking any convenient point as an axis of moments, such as the center of the engine truck axle, and multiplying the live load at each wheel by the distance of the load from the selected axis, the location of the center of gravity of all parts of the locomotive, other than those considered as dead loads, is determined. The next step is to find the location of the center of gravity of the live load with the engine truck removed, making the proper allowance for increased weight due to the larger cylinders, the outside valve gear,



Boston & Albany Eight-Wheel Switcher Converted from a Consolidation Type Freight Locomotive

ders and 57-in. driving wheels, and experience had shown that the locomotives were not sufficiently powerful to haul a satisfactory tonnage at scheduled speeds in freight service. Upon inspection, it was found that the frames, rods driving wheels and many minor parts could be utilized in the reconstruction of the locomotives into an 0-8-0 type. The mechanical department was authorized to prepare designs and begin the work of converting 12 locomotives at West Springfield shops.

The elimination of the engine truck with the consequent increase in the weight on driving wheels made it necessary to provide larger cylinders to obtain a properly proportioned and efficient locomotive. It was decided to apply 23-in. by 32-in. cylinders of the outside steam pipe design, a new boiler with a superheater, outside valve gear and Ragouet power reverse gear. A practically new, modern switching locomotive was thus produced adaptable to the requirements of service prevailing in Boston & Albany terminal yards. In order to utilize as much as possible the old frames and

the superheater, changes in the smokebox and bumper castings. In this computation, the entire weight of the superheater header and units was considered as concentrated at the front flue sheet. The center of gravity of the live load was 6 in. ahead of the plane midway between the main and intermediate driving wheels.

After determining the location of the center of gravity of the live load with engine truck removed, the weight of the boiler with two gages of water, and the center of gravity of the boiler and water should be found. In this calculation it is convenient to divide the boiler into four parts: the smokebox, first course, second course, and firebox. The weight of each of the four sections is assumed to be concentrated at the geometric center of each section. By taking moments about any convenient axis, such as the smokebox front, the center of gravity of the boiler and water may be calculated and it will then be possible to determine the weight and location of the center of gravity of what we may term the machinery of the locomotive.

Knowing the weight and location of the center of gravity of the boiler and of the machinery, we can at once compute the number of inches the boiler must be moved towards the rear in order to bring the center of gravity of the locomotive midway between the main and intermediate wheels. It is important that this be done in order to insure correct distribution of the load between the four pairs of driving wheels, and it is also essential that special attention be given to the design of the equalizing rigging. We have used the latest type of equalizer arrangement with transverse equalizer at the forward end of the locomotive.

It was found that in order to compensate for the removal of the engine truck and the changes outlined, the boiler should be moved towards the rear 14 1/4 in. and the new boiler was designed to meet this condition.

Owing to the use of outside steam pipes with the new cylinders, a new single rail front frame section was necessary on the converted locomotives. The old frames were cut at the front pedestal jaws and the new cast steel front sections welded on by the thermit process. The frames are unusually well re-enforced, and on account of the increase in power of the eight-wheel locomotive, as compared with the Consolidation locomotive, we considered it advisable to apply a stronger type of pedestal binder, replacing the old thimble type by cutting off the lower part of the pedestals, and filling up the bolt holes with the aid of the electric welder. A new cast steel front bumper beam has been applied and the foot plate is particularly heavy to compensate, in part, for the increase in weight at the forward part of the locomotive. The driver brake cylinders are supported in a vertical position from the guide yoke cross-tie and new cylinder levers, proportioned to give correct braking power, are connected to the old foundation brake rigging. A wide steel cab substantially braced replaces the old wooden cab, and the air reservoirs and running boards are securely supported by cast steel brackets, bolted to the boiler.

The boiler is of the straight top radial stay type, having a full installation of Tate flexible bolts, Security brick arch, and a single 14-in. by 20-in. fire door opening, designed for a pneumatically operated fire door of the Franklin butterfly type. There are four combustion tubes in each side of the firebox. As the two rear tubes on each side come within the cab, we have protected the enginemen by covering over the outer ends of the combustion tubes with 2-in. pipes which extend down to and through the cab running board and are arranged so that the air flowing into the combustion tubes is drawn from outside the cab.

Two sand boxes are located on top of the boiler and the

The tender tank has been remodelled so as to interfere as little as possible with the view of the enginemen when the locomotive is operated with tender leading. The longitudinal channel sills of the tender underframe have been re-enforced by plating and new cast steel end sills have been applied. The coupler and pocket at the rear of the tender are of the latest Sharon type, with a 3-in. pin.

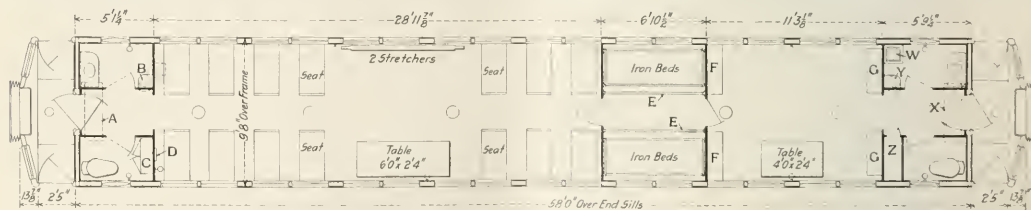
The first of the 12 locomotives to be converted has been in service a short time, and the results obtained are entirely satisfactory. The locomotive handles the cars without difficulty, starts and stops quickly, and the performance is fully up to expectations. The cost of labor and materials has advanced rapidly since work was begun, and while therefore the cost of converting the locomotives may exceed the estimates, the apparent saving compared with the cost of new locomotives of similar type is greater than was estimated on account of present abnormal prices.

A comparison of the principal characteristics of the Consolidation and the eight-wheel switcher is given below:

	CONSOLIDATION 20 in. by 32 in.	EIGHT-WHEEL SWITCHER 23 in. by 32 in.
Cylinders, diameter and stroke, in.....	195	180
Steam pressure, lb. per sq. in.....	195	180
Tractive effort, lb.....	37,190	45,440
Grate area, sq. ft.....	50.3	50.3
Heating surface, sq. ft.....	3,135	2,174
Superheating surface, sq. ft.....	None	422
Tubes, number of 2-in.....	359	175
Tubes, number of 5/8 in.....	None	26
Tubes, length.....	16 ft.	16 ft.
Superheater.....	None	Schmidt
Valve gear.....	Stephenson	Baker
Reverse gear.....	Hand-operated	Ragonnet
Wheel base.....	25 ft.	17 ft.
Weight drivers, lb.....	183,000	193,000
Factor of adhesion.....	4.4	4.25
Tender, tons coal.....	10	10
Tender, gallons water.....	5,000	6,000

CAR FOR B. & O. MEDICAL DEPARTMENT

The Relief Department of the Baltimore & Ohio, which includes the medical department, has recently had car No. 4178 fitted up for the convenience of traveling examiners in making physical examinations of telegraph operators. The plan and arrangement of the interior of the car are shown in the drawing. Its length is 58 ft. over the end sills and it is carried on eight wheels. The main compartment of the car, 29 ft. long, is called a coach section and is fitted with double seats, as shown in the drawing. The central space in this compartment has a table and a number of chairs. Next to the transverse partition at the right is the sleeping room in which are two double deck single iron beds; and beyond the next partition is the lounging room, 11 ft. 3 3/8 in. long. The shelves, F, G, in the four corners of this



Baltimore & Ohio Medical Examiners' Car

A, Water tank overhead; size 14 in. by 46 in. B, Y, Drinking water. C, Locker. D, Eye-testing cabinet. E, E, Curtain rods. F, F, Shelf; hooks beneath. G, G, Three shelves each side; space below for suit case. W, Gas stove. X, Water tank overhead. Z, Linen locker.

locomotive has the usual specialties: Pneumatic sanders, bell ringer, cylinder cock operating mechanism, Hancock type E injectors, Consolidated safety valves, Everlasting blow-off valve, King type packing and a special type of exhaust pipe which modifies the noise of the exhaust. The Radial buffer is provided between the locomotive and tender to facilitate the removal of drawbar for inspection and the power reverse gear is supported from the boiler by means of brackets made up of boiler plate.

room are fitted with curtains in the front and also at the ends.

The lamps fixed along the center of the car, overhead, as indicated by the circles, are gas, and five of the bracket lamps at the sides of the room are gas; the other four brackets support oil lamps, put in for emergency use.

The doors as well as the windows are screened to keep out flies. Other features of the car are indicated in the notes beneath the drawing.

Steam Railway Statistics to June 30, 1916

Interstate Commerce Commission's Annual Abstract
of the Year's Operations. Large Increases in Traffic

THE Interstate Commerce Commission has issued its abstract of statistics of railway operation for the fiscal year ended June 30, 1916, based on compilations for its twenty-ninth annual statistical report. Returns of switching and terminal companies are not included. Advance figures given in this abstract may be slightly modified by revision before final publication. Class I roads are those having annual operating revenues above \$1,000,000; Class II roads are those having annual operating revenues from \$100,000 to \$1,000,000; and Class III roads are those having annual operating revenues below \$100,000.

MILEAGE

On June 30, 1916, the roads covered by this abstract represented 259,210.86 miles of line operated, including 11,856.42 miles used under trackage rights. The aggregate mileage of railway tracks of all kinds covered by operating returns for these roads was 394,944.26 miles, classified as follows:

Item	Roads			
	Class I	Class II	Class III	Total
Miles of road.....	331,263.98	18,913.68	9,033.20	259,210.86
Miles of second main track.....	38,732.50	195.84	6.87	38,935.21
Miles of third main track.....	2,725.58	5.04		2,730.62
Miles of fourth main track.....	1,960.00			1,960.00
Miles of all other main tracks.....	238.34			238.34
Miles of yard track and sidings.....	97,198.95	3,716.75	953.53	101,869.23
Total, all tracks.....	362,119.35	22,831.31	9,993.60	394,944.26

The increase in mileage of all tracks for the year was 3,802.75 miles. Of this 1,641.54 miles were in single or first track, and 1,959.07 miles in yard track and in sidings.

EQUIPMENT

There were 63,862 locomotives in service on June 30, 1916, as follows:

Kind of locomotive	Roads			
	Class I	Class II	Class III	Total
Steam.....	60,790	1,928	860	63,578
Other.....	267	14	3	284
Total.....	61,057	1,942	863	63,862

The total number of cars was 2,478,159, including

Item	Class I roads		Class II roads		Class III roads		Total	
	Number	Aggregate capacity Tons	Number	Aggregate capacity Tons	Number	Aggregate capacity Tons	Number	Aggregate capacity Tons
Box cars.....	1,014,219	36,582,648	9,015	276,252	1,184	28,205	1,024,418	36,887,105
Flat cars.....	120,393	4,505,486	12,783	386,396	3,543	99,405	136,719	4,991,377
Stock cars.....	82,123	2,652,574	1,204	36,752	1,307	43,307	83,457	2,690,633
Coal cars.....	873,316	41,244,672	22,904	998,558	1,418	56,057	899,638	42,299,287
Tank cars.....	9,462	360,092	249	7,156	117	3,928	9,828	391,176
Refrigerator cars.....	51,610	1,669,462	130	3,355	6	150	51,746	1,672,967
Other freight-train cars.....	83,189	3,731,160	6,826	232,703	2,412	49,127	92,427	4,012,990
Total.....	2,236,312	90,766,094	53,201	1,941,172	8,750	238,269	2,298,263	92,945,535

passenger service, 54,664; freight service 2,326,987; company service, 96,508. These figures do not include so-called private cars.

Of the cars in freight service, exclusive of caboose cars, 2,298,263 were classified as shown in the table.

EMPLOYEES

Class I, Class II, and Class III roads, operating 258,669.75 miles of line, reported 1,054,075 as the average number of employees in their service during the year. The total compensation reported was \$1,403,968,437. Because of a change in classification, the figures for 1916 are not comparable with figures relating to 1915.

CAPITALIZATION OF RAILWAY PROPERTY*

On June 30, 1916, according to reports of operating roads and their nonoperating subsidiary lines, the par value of railway capital was \$21,092,372,245. This includes capital securities held by the railway companies concerned, as well as by the public. Of the total there existed as stock, \$9,058,982,733, and as funded debt, \$12,033,389,512.

Capital Actually Outstanding on June 30, 1916

Class	Total capital	Stock, thousands			
		Total	Common	Preferred	Debt
Class I.....	\$16,101,172,989	\$6,918,712	\$5,672,039	\$1,236,948	\$15,723
Class II.....	655,174,740	375,699	345,401	30,296	1
Class III.....	153,758,362	97,289	91,876	5,412	
Nonoperating.....	2,771,387,001	1,351,705	1,209,893	141,611	200
Total.....	\$19,681,493,092	\$8,743,406	\$7,319,211	\$1,408,270	\$15,924

Capital Outstanding Continued

Class	Total capital	Funded debt, thousands			
		Mortgage bonds	Collateral trust bonds	Income bonds	Miscellaneous obligations
Class I.....	\$6,779,054	\$931,984	\$234,995	\$903,365	\$333,041
Class II.....	238,903	588	8,325	5,094	6,563
Class III.....	53,143	112	2,300	462	450
Nonoperating.....	1,187,644	57,440	23,167	140,503	10,925
Total.....	\$8,278,744	\$990,125	\$268,789	\$1,049,446	\$350,980

Capital Outstanding—Continued

Class	Total capital	Total funded debt, thousands			
		Mortgage bonds	Collateral trust bonds	Income bonds	Miscellaneous obligations
Class I.....	\$1,410,879,153	\$315,576	\$284,012	\$31,543	\$20
Class II.....					
Class III.....					
Nonoperating.....					
Total.....					

Capital Nominally Issued or Nominally Outstanding

Class	Total capital	Stock, thousands			
		Total	Common	Preferred	Debt
Class I.....	\$1,301,170,117	\$264,143	\$234,129	\$29,994	\$20
Class II.....	60,039,344	33,402	32,206	195	
Class III.....	7,737,383	2,002	2,038	4	
Nonoperating.....	41,932,309	16,968	15,638	1,326	
Total.....	\$1,410,879,153	\$315,576	\$284,012	\$31,543	\$20

Nominal Capital—Continued

Class	Total capital	Funded debt, thousands			
		Mortgage bonds	Collateral trust bonds	Income bonds	Miscellaneous obligations
Class I.....	\$919,040	\$71,365	\$3,814	\$8,919	\$23,886
Class II.....	26,898	450	178	110	
Total.....					

Class	Total capital	Total funded debt, thousands			
		Mortgage bonds	Collateral trust bonds	Income bonds	Miscellaneous obligations
Class I.....	\$75,801	\$72,004	\$14,488	\$9,132	\$23,886
Class II.....					
Class III.....					
Nonoperating.....					
Total.....					

Class	Total capital	Total funded debt, thousands			
		Mortgage bonds	Collateral trust bonds	Income bonds	Miscellaneous obligations
Class I.....	\$1,410,879,153	\$315,576	\$284,012	\$31,543	\$20
Class II.....					
Class III.....					
Nonoperating.....					
Total.....					

* As covered by these statements, "Actually issued" securities are those which have been sold for a valuable consideration to bona fide purchasers who hold them free from control by the issuing company. Securities actually issued and not reacquired by or for an issuing company are considered to be "actually outstanding." "Nominally issued" securities are those which have been signed and sealed and placed with the proper officers for sale and delivery or are pledged or otherwise placed in some special fund of the issuing company. "Nominally outstanding" securities are those reacquired by or for the issuing company and held alive.

Of the total capital stock actually outstanding for the roads under consideration, \$3,581,434,810, or 40.96 per cent paid no dividends. The amount of dividends declared during the year (by both operating and nonoperating companies represented in this statement) was \$411,975,955, being the equivalent to 7.98 per cent on dividend-paying stock. The average rate of dividends paid on all stocks actually outstanding, pertaining to the roads under consideration, was 4.71.

INVESTMENT IN ROAD AND EQUIPMENT

The figures include returns for operating roads of Class I and Class II, and their subsidiary nonoperating roads. The expenditures for additions and betterments, as well as the expenditures for new lines and extensions, during the year, are analyzed in the following statement:

Investment to June 30, 1916 (239,392.31 miles of line represented).....	\$17,525,576,908
Investment to June 30, 1915 (238,162.14 miles of line represented).....	17,267,119,423
Increase, 1916 over 1915.....	\$258,457,485
Investment during the year:	
In new lines and extensions.....	\$41,885,894
In additions and betterments:	
On owned lines \$222,794,554	
On leased lines 16,454,252	
239,249,206	
Total investment during the year.....	\$281,135,100
Adjustments.....	\$1,104,672
Difference between record value of grantor and purchase price of grants in cases of roads sold, merged, consolidated, etc.....	23,782,287
Total during the year.....	22,677,615
Net increase during the year.....	\$258,457,485

PUBLIC SERVICE OF RAILWAYS

The following table gives comparative figures for 1916 and 1915 pertaining to public service of railways and covers returns for roads having operating revenues above \$100,000 for the year:

Item	Year ended June 30—	
	1916	1915
Number of passengers carried.....	1,005,683,174	976,303,602
Number of passengers carried 1 mile.....	34,213,596,127	32,384,247,563
Number of passengers carried 1 mile per mile of road.....	137,818	131,165
Number of tons of revenue freight carried, including freight received from connections.....	2,225,943,388	1,802,018,177
Ton-mileage, or number of tons carried 1 mile.....	343,099,937,805	276,830,302,723
Freight density, or number of tons carried 1 mile per mile of road.....	1,380,349	1,121,059
Average number of ton-miles of revenue freight per train-mile.....	534.95	474.45
Average receipts per passenger per mile—(cents).....	2.006	1.985
Average receipts per ton per mile.....(cents)	0.716	0.732
Passenger-service train revenue per train-mile.....	\$1.38619	\$1.30858
Freight revenue per train-mile.....	\$3.82828	\$3.46995
Operating revenues per train-mile.....	\$2.80074	\$2.51895
Operating expenses per train-mile.....	\$1.83279	\$1.77641
Ratio of operating expenses to operating revenues.....(per cent)	65.44	70.52

REVENUES AND EXPENSES

The operating revenues for the year ended June 30, 1916, of the railways in the United States herein presented (average mileage operated, 257,982.45 miles) were \$3,472,641,941, or \$13,461 per mile of line operated; their operating expenses were \$2,277,202,278, or \$8,827 per mile of line operated. The following tables present a statement of the operating revenues in detail and a statement of the operating expenses assigned to the eight general classes:

OPERATING REVENUES—(a) RAIL; (b) WATER; (c) INCIDENTAL

Item	Roads			
	Class I	Class II	Class III	Total
Freight.....	\$2,402,210,995	\$54,721,135	\$12,094,791	\$2,469,026,921
Passenger.....	673,806,175	13,446,474	2,374,294	689,626,943
Excess baggage.....	6,267,466	99,039	15,287	6,381,792
Sleeping car.....	2,918,941	940		2,919,881
Parlor and chair car.....	1,328,166	14,098	1,781	1,344,045
Mail.....	60,126,464	1,096,247	255,102	61,477,813
Express.....	80,871,864	1,011,570	208,101	82,091,535
Other passenger-train.....	5,753,940	39,395	8,156	5,801,491

Item	Roads			
	Class I	Class II	Class III	Total
Milk.....	15,465,779	307,491	134,600	15,907,870
Switching.....	36,558,669	1,809,631	233,782	38,602,082
Special service train.....	1,375,194	96,637	10,283	1,682,114
Other freight-train.....	336,223	24,876	1,537	362,636
Water transfers—				
Freight.....	647,651	935		648,586
Passenger.....	1,680,553	29,827		1,710,380
Vehicles and live stock.....	2,147,230	44,074		2,191,304
Other.....	1,066,830	33		1,066,865
Total rail-line transportation revenue.....	\$3,292,762,140	\$72,742,404	\$15,337,714	\$3,380,842,258
Freight.....	\$12,837,782	\$458,644	\$15,100	\$13,311,526
Passenger.....	1,410,308	252,154	21,467	1,683,929
Excess baggage.....	4,707	180	97	4,984
Other passenger service.....	56,070	5,782		61,852
Mail.....	24,928	19,605	5,740	50,273
Express.....	18,511	9,537	1,999	30,047
Special service.....	2,350	950		3,300
Other.....	321,270	292	4,158	325,720
Total water-line transportation revenue.....	\$14,675,926	\$747,144	\$48,561	\$15,471,631
Dining and buffet.....	\$17,244,591	\$3,965		\$17,248,556
Hotel and restaurant.....	5,748,929	14,057	\$546	5,763,532
Station, train, and boat privileges.....	3,954,029	43,826	3,827	4,001,682
Parcel room.....	965,780	2,500	58	968,338
Storage—Freight.....	2,785,505	41,666	8,449	2,835,420
Storage—Baggage.....	611,860	4,001	414	646,275
Demurrage.....	14,353,124	592,480	86,594	15,032,198
Telegraph and telephone.....	1,772,337	71,957	14,447	1,858,741
Grain elevator.....	1,773,359			1,773,359
Stockyard.....	1,435,058	54		1,435,112
Power.....	2,065,377	67,358	731	2,133,466
Rents of buildings and other property.....	4,464,158	279,696	55,702	4,799,556
Miscellaneous.....	14,701,837	721,294	146,250	15,569,381
Total incidental operating revenue.....	\$71,905,784	\$1,842,854	\$317,018	\$74,065,656
Joint facility—Cr.....	\$3,598,814	\$42,339	\$6,140	\$3,647,293
Joint facility—Dr.....	1,344,798	39,966	133	1,384,897
Total joint facility operating revenue.....	\$2,254,016	\$2,373	\$6,007	\$2,262,396
Total railway operating revenues.....	\$3,381,597,866	\$75,334,775	\$15,709,300	\$3,472,641,941
RAILWAY OPERATING EXPENSES				
Maintenance of way and structures.....	\$404,511,144	\$12,892,387	\$4,094,367	\$421,500,898
Maintenance of equipment.....	557,664,332	10,582,293	2,079,782	570,326,407
Traffic expenses.....	60,633,984	1,341,869	227,244	62,203,097
Transportation expenses—Rail line.....	1,680,797,803	24,032,524	5,395,133	1,710,225,460
Transportation expenses—Water line.....	9,302,391	651,335	25,696	9,979,422
Miscellaneous operations.....	25,249,704	212,426	11,822	25,473,952
General expenses.....	79,192,476	3,558,788	1,211,396	83,962,660
Transportation for investment—Cr.....	6,462,048	24,149	8,754	6,494,951
Total railway operating expenses.....	\$2,210,892,786	\$53,247,473	\$13,062,019	\$2,277,202,278

¹ Includes \$25,333, unclassified.

INCOME ACCOUNT AND PROFIT AND LOSS ACCOUNT

The income present for the year ended June 30, 1916, the condensed income account and the profit and loss account of the operating roads and of their subsidiary nonoperating roads. The figures include such intercorporate payments as may be involved in the items stated. Returns for a few small roads have been omitted because of incompleteness. The accounts of the operating roads include both operating and financial transactions, while the accounts of the nonoperating roads are confined for the most part to receipts and payments under leases, contracts, and agreements. For a number of items, such as dividends, taxes, etc., figures for all roads must be taken into consideration in order to learn the aggregates of such items for the classes of railway companies represented.

INCOME ACCOUNT

Item	Operating roads				Nonoperating roads			
	Class I roads	Class II roads	Class III roads	Total operating roads	Subsidiary to Class I roads	Subsidiary to Class II roads	Subsidiary to Class III roads	Total nonoperating roads
OPERATING INCOME								
Railway operating revenues.....	\$3,381,597,866	\$75,334,775	\$15,709,300	\$3,472,641,941	.....	.....	.....	.....
Railway operating expenses.....	2,210,892,786	53,247,473	13,062,019	2,277,202,278	.....	.....	.....	.....
Net revenue from railway operations.....	\$1,170,705,080	\$22,087,302	\$2,647,281	\$1,195,439,663	.....	.....	.....	.....
Railway tax accruals.....	\$145,517,034	\$3,784,568	\$712,939	\$150,014,541	\$1,569,237	\$14,677	\$1,386	\$1,585,300
Uncollectible railway revenues.....	806,747	13,997	1,788	822,532	.....	.....	.....	.....
Railway operating income.....	\$1,024,381,299	\$18,288,737	\$1,932,554	\$1,044,602,590	\$1,569,237	\$14,677	\$1,386	\$1,585,300
Revenues from miscellaneous operations.....	\$38,327,124	\$32,418	\$168,058	\$38,527,600	.....	.....	.....	.....
Expenses of miscellaneous operations.....	32,821,593	41,196	145,669	33,008,368	.....	.....	.....	.....
Net revenue from miscellaneous operations.....	5,505,531	8,222	22,389	5,536,150	.....	.....	.....	.....
Taxes on miscellaneous operating property.....	2,075,769	1,878	1,618	2,079,265	.....	.....	.....	.....
Miscellaneous operating income.....	\$3,429,852	\$10,656	\$20,771	\$3,439,967	.....	.....	.....	.....
Total operating income.....	\$1,027,811,151	\$18,278,081	\$1,953,325	\$1,048,042,557	\$1,569,237	\$14,677	\$1,386	\$1,585,300
NONOPERATING INCOME								
Hire of freight cars—Credit balance.....	\$14,761,360	\$1,831,872	\$130,904	\$16,724,136	.....	.....	.....	.....
Rent from locomotives.....	6,334,448	230,966	55,929	6,621,343	.....	.....	.....	\$4,920
Rent from passenger-train cars.....	10,536,527	87,471	9,036	10,633,029	.....	.....	.....	12,360
Rent from floating equipment.....	201,553	3,712	82	205,347	.....	.....	.....	.....
Rent from work equipment.....	1,740,122	33,636	2,751	1,776,509	.....	.....	.....	.....
Joint facility rent income.....	24,586,140	1,077,696	167,266	25,831,102	.....	.....	.....	.....
Income from lease of road.....	5,201,666	5,207,575	13,026	5,739,299	130,976,289	196,854	1,181	131,399,525
Miscellaneous rent income.....	8,167,136	275,614	18,011	8,460,761	107,881	291	1	108,173
Miscellaneous nonoperating physical property.....	2,831,487	57,522	10,109	2,899,118	100,273	280	.....	100,553
Separately operated properties—Profit.....	3,402,031	1,630	.....	3,403,661	40,837	.....	.....	40,837
Dividend income.....	95,089,195	22,365	1,083	95,112,643	406,037	.....	.....	406,037
Income from funded securities.....	44,327,083	224,555	49,837	44,601,475	2,952,865	.....	.....	2,940,867
Income from unfunded securities and accounts.....	24,952,949	316,309	54,571	25,323,829	457,725	3,114	.....	460,839
Income from sinking and other reserve funds.....	2,687,560	45,258	4,425	2,737,243	548,881	.....	.....	548,881
Release of premiums on funded debt.....	268,286	129,599	.....	397,885	32,843	937	.....	33,780
Contributions from other companies.....	1,182,540	49,851	186,177	1,418,568	.....	.....	.....	.....
Miscellaneous income.....	2,167,129	91,723	11,479	2,270,331	219,870	7,948	97	228,025
Total nonoperating income.....	\$247,439,827	\$5,654,536	\$714,579	\$253,808,942	\$136,378,268	\$208,994	\$126,180	\$136,713,442
Gross income.....	\$1,275,250,978	\$23,932,617	\$2,667,904	\$1,301,851,499	\$134,809,031	\$194,317	\$124,794	\$135,128,142
DEDUCTIONS FROM GROSS INCOME								
Hire of freight cars—Debit balance.....	\$37,589,718	\$3,006,238	\$645,015	\$41,240,971	\$705,246	\$8	.....	\$705,254
Rent for locomotives.....	5,632,815	534,979	139,249	6,307,043	183,947	.....	.....	183,947
Rent for passenger-train cars.....	11,225,471	321,891	55,712	11,603,074	312,851	.....	.....	312,851
Rent for floating equipment.....	2,170,021	11,055	.....	2,181,076	.....	.....	.....	.....
Rent for work equipment.....	470,532	23,949	10,667	505,148	3,672	.....	.....	3,672
Joint facility rents.....	40,539,898	922,667	119,254	41,571,819	738,100	.....	.....	738,100
Rent for leased roads.....	139,215,095	305,649	265,829	139,786,573	951,690	.....	.....	951,690
Miscellaneous rents.....	2,220,362	139,608	40,020	2,400,000	318,992	60	\$5	320,047
Miscellaneous tax accruals.....	2,408,033	29,691	8,471	2,446,291	296,192	.....	.....	296,192
Separately operated properties—Loss.....	3,554,349	.....	735	3,555,084	7,152	.....	.....	7,152
Interest on funded debt.....	399,348,125	13,822,770	2,305,992	415,036,887	58,599,587	151,784	66,750	58,818,116
Interest on unfunded debt.....	15,066,312	1,591,758	1,234,638	17,892,708	2,800,867	12,487	42,414	2,855,767
Amortization of discount on funded debt.....	2,958,935	216,398	50,209	3,225,542	239,527	850	.....	240,377
Maintenance of investment organization.....	359,722	6,010	.....	365,732	362,887	8,664	2,880	374,431
Income transferred to other companies.....	3,558,614	351,687	15,384	3,925,685	2,066,898	9,990	.....	2,076,888
Miscellaneous income charges.....	3,670,653	36,395	1,304	3,707,752	216,085	.....	4,198	220,283
Total deductions from gross income.....	\$672,028,085	\$20,880,745	\$4,928,774	\$697,837,604	\$67,443,659	\$183,843	\$116,292	\$67,743,794
Net income.....	\$603,222,893	\$3,051,872	\$2,260,870	\$604,013,895	\$67,365,372	\$10,474	\$8,502	\$67,384,348
DISPOSITION OF NET INCOME								
Income applied to sinking and other reserve funds.....	\$11,693,194	\$318,487	\$37,314	\$12,049,995	\$796,547	.....	.....	\$796,547
Dividend appropriations of income.....	184,044,513	1,681,286	252,009	185,977,808	40,258,834	\$58,449	\$19,050	40,336,303
Income appropriated for investment in physical property.....	\$1,033,749	41,639	64,444	\$1,141,832	1,985,333	.....	.....	1,985,333
Stock discount extinguished through income.....	.....	10,751	12,469	23,223	.....	.....	.....	.....
Miscellaneous appropriations of income.....	17,580,579	1,700	8,437	17,590,716	140,572	.....	.....	140,572
Total appropriations of income.....	\$764,352,035	\$2,425,866	\$374,673	\$767,152,574	\$43,181,256	\$58,449	\$19,050	\$43,258,755
Income balance transferred to profit and loss.....	\$33,870,858	\$626,006	\$2,635,543	\$33,861,321	\$24,184,116	\$47,975	\$10,548	\$24,122,593

PROFIT AND LOSS ACCOUNT

Item	Operating roads				Nonoperating roads			
	Class I roads	Class II roads	Class III roads	Total operating roads	Subsidiary to Class I roads	Subsidiary to Class II roads	Subsidiary to Class III roads	Total nonoperating roads
Credit balance transferred from income.....	\$355,811,083	\$7,707,411	\$1,129,190	\$364,647,684	\$27,930,980	\$49,440	\$4,550	\$28,012,572
Profit on road and equipment sold.....	7,564,263	63,077	.....	7,627,340	94,014	.....	.....	94,014
Delayed income credits.....	1,095,177	212,183	56,598	1,363,958	758,774	.....	.....	758,774
Unrefundable overcharges.....	672,042	2,741	221	675,004	1,255	.....	.....	1,255
Donations.....	1,085,329	98,576	97,487	1,281,392	165,953	.....	.....	165,953
Miscellaneous credits.....	64,196,647	7,488,491	957,558	72,642,696	2,152,474	1,389	0.58	2,174,445
Total credits during year.....	\$425,711,217	\$15,538,441	\$2,249,414	\$443,499,072	\$31,093,419	\$50,829	\$6,734	\$31,206,982
Debit balance transferred from income.....	\$16,940,225	\$7,081,405	\$3,764,733	\$27,786,363	\$3,736,864	\$97,415	\$52,700	\$3,886,979
Surplus applied to sinking and other reserve funds.....	7,564,263	63,077	.....	7,627,340	94,014	.....	.....	94,014
Dividend appropriations of surplus.....	97,891,858	2,484,205	264,297	100,640,360	13,687,162	20,900	21,313	13,728,475
Surplus appropriated for investment in physical property.....	22,545,621	286,442	34,908	22,866,971	156,091	.....	.....	156,091
Stock discount extinguished through surplus.....	32,814	2,217,143	7,900	2,257,857	15,630	.....	.....	15,630
Debit discount extinguished through surplus.....	20,074,624	393,813	4,055	20,472,492	110,000	102	.....	110,104
Miscellaneous appropriations of surplus.....	922,127	60,259	56,327	1,038,713	45,201	.....	.....	45,201
Loss on retired road and equipment.....	20,417,850	627,493	242,727	21,287,070	757,611	238,275	4,812	1,010,698
Delayed income debits.....	1,566,249	1,460,959	90,110	3,117,318	615,306	.....	.....	615,306
Miscellaneous debits.....	52,580,010	2,011,735	677,790	55,269,535	1,049,889	2,846	69,563	1,122,298
Total debits during year.....	\$740,555,641	\$16,686,530	\$5,172,427	\$762,414,598	\$20,708,881	\$358,638	\$162,200	\$21,229,688
Net increase during year.....	\$185,155,576	\$1,148,069	\$2,923,013	\$189,086,658	\$10,384,578	\$507,809	\$89,475	\$9,972,294
Balance at beginning of year.....	\$88,965,986	\$24,51,067	\$16,863,013	\$87,251,999	\$16,705,283	\$96,795	\$74,601	\$15,063,675
Balance at end of year.....	\$1,074,121,562	\$25,999,156	\$19,786,026	\$1,109,906,744	\$27,089,861	\$721,204	\$54,088	\$28,012,169

WORKMEN'S COMPENSATION LAWS

The National Industrial Conference Board, M. W. Alexander, secretary, 15 Beacon street, Boston, has issued a pamphlet of 60 pages, 6 in. x 9 in., summarizing a study which has been made of workmen's compensation laws throughout the country, and making recommendations on the legal phase of the subject. The National Industrial Conference Board represents textile manufacturers, metal trades and other large interests.

The vital principle of workmen's compensation is defined as "the substitution of a definite and certain measure of relief for the former uncertainties of redress through litigation." The new method ignores the question of fault of anyone except where it is clearly wilful, and classes industrial accidents as necessarily incidental to industrial activity. Compensation acts thus aim to meet a public necessity, not to redress a private wrong.

Thirty-seven states and four territories of the United States now have compensation laws, and a federal compensation act for civilian employees was adopted last September.

The compensation principle now applies to more than two-thirds of the wage-earners in the United States. The laws of the various states reveal curious and glaring inconsistencies. West Virginia, Michigan and California exclude traveling salesmen from compensation benefits; Minnesota includes them only if employed by a Minnesota employer; New Jersey includes them while in the state, even though they are not residents. Domestic and casual laborers are usually excluded. In numerous industries, particularly agriculture, compensation acts do not apply to the small employer. Agricultural labor is specifically included under compensation legislation by only one state, New Jersey; in 23 states it is specifically excluded.

In 8 states workmen's compensation acts are compulsory upon the employer. In 24 states he has an election, but if he does not accept, he must forfeit some or all of his common law defenses in any action brought by an injured employee. In 25 states the employer affected by compensation acts must either insure his liability or demonstrate his financial capacity for self-insurance. In several states contribution to a state insurance fund is obligatory.

Classification of "hazardous" occupations is very uncertain, and the term "accident" is variously defined. The Ohio Industrial Commission awarded compensation to the dependents of a stenographer because, while taking dictation from her employer, she was murdered by a jealous suitor; the New York Industrial Commission awarded compensation for the death of a street-railway process server from gangrenous diabetes alleged to have resulted from having his toes trodden upon by a fellow passenger in a street-railway car of the company which employed him.

In this country "occupational diseases," as a rule, are not included under the term "accident" in workmen's compensation acts, but in the administration of these acts an increasing tendency to include many forms of diseases contracted during employment is evident.

The report gives the decisions of the Supreme Court of the United States in three important cases involving workmen's compensation acts. This court has maintained the power of a State to compel contributions by employers to a state accident fund.

The report recommends that all states immediately undertake to establish a permanent, scientific, and uniform system of compiling accident statistics, and to make a clear distinction in statutes between the terms "occupational disease," "accident" and "injury." Direct settlement of claims between employer and employee is advocated. An exclusively compulsory system of compensation is endorsed on the ground that it would eliminate many technical uncertainties.

This report on the legal phase of workmen's compensa-

tion acts is to be followed by other reports on the medical, economic and administrative phases. The price of the pamphlet is one dollar.

ANTIQUATED PORT FACILITIES*

A marked lack of modern facilities for the expeditious and economical transfer of freight from cars and vessels to docks and from docks to vessels and cars, is one of the chief causes of the present congestion of freight at New York harbor, and the installation of modern cranes is an imperative duty; a duty which should be taken up by the federal government if the state and municipal authorities and the railroad and steamship lines continue to neglect to give it proper attention.

This is the conclusion of H. McL. Harding, president of the Society of Terminal Engineers, in an article published recently in the New York Journal of Commerce.

To enforce his points, Mr. Harding presents the result of comparisons which have been made at three French ports, showing the freight-transfer capacity of the docks at those ports before and after adequate apparatus had been installed. His statement, showing the annual average transferring capacity per linear yard, is as follows:

	Average of the whole port per linear yard.	Average of portion equipped.
Havre	385 tons	1,430 tons
Rouen	483 tons	1,121 tons
Marseilles	665 tons	1,694 tons

These figures are understood to cover a period in which the whole of each port was fully occupied by vessels, a part of the waterfronts having been improved and other parts left unimproved.

Some of the piers in New York are so old and poorly designed that not much improvement would be possible, but Mr. Harding thinks that on the North river water-front, from Twelfth street north to Seventy-second street, improvements might be made within a short time which would double the capacity of these piers for handling freight. The controversy between the New York Central Railroad and the city of New York over the proposed improvements on this water-front might be quickly settled, as regards the territory south of Seventy-second street; and this ought to be done. The question at issue north of Seventy-second street has to do with the permanence and the beauty of a pleasure park and can be treated as a separate problem.

Suitable improvements would not only increase the capacity of the docks in the element of celerity but would also reduce the cost per ton. The present facilities are antiquated to such an extent as to be objects of ridicule. The capacity of the piers per linear foot is not over 150 tons a year. It is easily demonstrable that, with suitable apparatus, freight can be transferred expeditiously at 18 cents a ton, as compared with a present minimum of 54.85 cents a ton; this latter figure being the result of experiments made by the United States Government at New Orleans. It is only by the use of modern cranes that the full storage capacity of piers can be utilized; suitable cranes make it practicable to pile freight higher.

FUEL ON THE RUSSIAN RAILWAYS.—The central administration of the railways has presented the Ministry of Trade and Industry with a report, according to which the demands of the Russian railways for fuel in 1917 are as follows:—Donetz coal, 23,148,000,000 lb.; Russian Asiatic coal, 7,128,000,000 lb.; petroleum, 6,624,000,000 lb.; timber, 11,900,000 cu. ft. However, as it will hardly be possible to satisfy these demands to their full extent as regards coal and liquid fuel, it has been decided to cover the deficiency by an additional supply of 17,500,000 cu. ft. of timber.

*The conditions described by Mr. Harding are well known as regards a large part of the New York water front, but it should be borne in mind that in New York harbor may be found also the great modern, Bush Terminals, which are among the largest and best equipped docks in the world.

Roads Speed-Up 20 Per Cent with Less Equipment

The Railroads Are Handling from 16 to 20 Per Cent More Business With Fewer Freight Cars Than in 1915

WITH only one and four-fifths per cent more cars, railroads operating 173,105 miles of line handled 16.1 per cent more freight in May, 1917, than in May, 1916. Going back a year further it develops that the railroads of the country handled about 30 per cent more freight in May, 1916, than in May, 1915. In the year 1916 as a whole they handled 20 per cent more business than in 1915. Records of 67 of the larger roads given on the following pages show that to handle this 20 per cent more business they had not more, nor even the same, but actually 16,701 less freight cars.

Details concerning the increase in business—May, 1917, over May, 1916—are given in a statement issued last Saturday by Fairfax Harrison, Chairman of the Railroads' War Board. Mr. Harrison said:

"Gratifying indication of the extent to which the railroads of the United States are making effective their effort to produce greater transportation efficiency to aid in winning the war, is afforded by reports just received by the Railroads' War Board of freight operations during May.

"The first meeting of the War Board was held on April 23. Figures for May, the first full month following, show that the railroads rendered about 16 per cent more freight service with practically the same number of cars and locomotives as last year.

"New railroad equipment which can be made in America is now being sent to our Allies in Europe. The problem of our railroads is to handle a very great increase in freight with virtually no increase in cars, locomotives or tracks. In that effort they are not only co-operating among themselves, but are receiving splendid support from the public and the shippers.

"Actual returns now compiled are from railroads operating 173,105 miles of line. The reports show that these lines in May last year gave service equivalent to carrying 25,426,845,011 tons of freight one mile, while this year they carried 29,522,870,109 tons one mile, an increase of exactly 16.1 per cent.

"This increase in service was rendered with a very light increase in the amount of equipment used. The number of freight locomotives in service in May last year was 24,362, while this year the number was 24,483, an increase of one-half of one per cent.

"Last year in May there was 1,800,842 freight cars in service, while this year the number was 1,833,921, an increase of one and four-fifths per cent.

"A distinct mark of progress is the great reduction in the number of freight cars in the shop or awaiting repairs. Last year in May there were 113,147 cars under, or awaiting repairs, while this year only 104,061 were in that condition. Locomotives in repair, or awaiting repairs last year were 4,006 and in May this year 3,593, a reduction of 10.3 per cent.

"Last year, railroad locomotives ran an average of 65.6 miles per day, while this year they made 71.3 miles per day.

"Freight cars made an average of 28.3 miles a day in May last year, and this year 29.6 miles, an increase of five per cent. In the same period, the mileage of cars moving empty was reduced by five per cent, while the mileage of cars moving under load was increased by 9.5 per cent.

"The foregoing figures will appear all the more remarkable when it is realized that May, 1916, was itself a month of heavy traffic."

THE DETAILED FIGURES FOR 67 ROADS

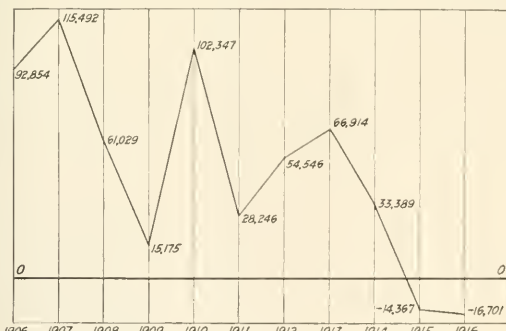
The 67 roads, mentioned above, operating 200,000 miles of line handled about 20 per cent more freight in the year 1916 than in 1915, but to do it they had not more freight cars, but actually 16,701 less cars than in 1915. The figures showing the freight equipment on these important roads will emphasize how the railroads have increased their efficiency, and they will also emphasize what has been noted so many times previously, namely, that the acquisitions of freight cars by the railroads have not been keeping pace with the demands upon them for increased service.

These comparative summaries of freight cars in service on these same railroads have been published annually in the *Railway Age Gazette* and its predecessor the *Railroad Gazette* since 1905. From 1906 to 1914 the totals always showed an increase in freight cars of from 15,000 to 115,000 annually, good times and bad, an average increase of 63,332 a year. In 1915, however, they showed for the first time a decrease of 14,367, but this year, the decrease is 16,701.

THE FREIGHT CARS OF 67 ROADS

	Freight cars	Inc. or dec. over preceding year
1905	1,461,158	.....
1906	1,554,012	92,854
1907	1,669,504	115,492
1908	1,730,533	61,029
1909	1,715,358	15,175
1910	1,817,705	102,347
1911	1,845,951	28,246
1912	1,900,497	54,546
1913	1,967,411	66,914
1914	2,000,800	33,389
1915	1,986,433	-14,367
1916	1,969,732	-16,701

One of the two tables, it is true, does show an increase of 862,014 cars or 77.82 per cent over 1900, but it is worth



Increases or Decreases in Freight Cars Owned by 67 Important Roads

observing that this increase of 77.82 per cent compares with an increase of about 200 to 250 per cent in freight traffic in the same period.

The *Railway Age Gazette* has noted again and again in its columns that the railways have not been buying freight cars in as great quantities as they would like. For many months both before and after the beginning of the European War the reason was the lack of funds and the inability to raise them. The railways now have the funds, but prices have become so high that no railway can well afford to buy cars at the present figures. The best authorities agree

COMPARATIVE SUMMARY OF FREIGHT CARS IN SERVICE ON RAILROADS OF THE UNITED STATES—1915 AND 1916

Note.—Narrow-gauge cars excluded. Non-revenue cars excluded. Company freight excluded.	Miles	Freight equipment			Per cent change	Freight cars per mile of road			Per 1,000 rev. ton miles			Rate per \$1,000 frt. earnings				
		1915	1916	In- crease		1915	1916	Average length of haul	1915	1916	1917	1915	1916	1917		
NEW ENGLAND RAILS—																
Boston & Maine.....	2,302	2,252	23,410	22,834	576	2.52	10.2	10.1	106.55	111.77	111	0.097	0.095	0.077	
Bangor & Aroostook.....	631	631	5,299	5,231	22	0.41	8.4	8.4	124.52	125.77	249	0.263	0.223	0.182	
Central Vermont.....	1,116	1,200	9,663	10,065	296	2.63	0.93	7.7	7.4	95.96	96.36	119	0.157	0.141	0.109	
New York, New Haven & Hartford.....	2,063	2,004	34,308	33,972	336	0.89	17.1	16.9	91.65	87.63	170	0.164	0.157	0.138		
Total.....	6,563	6,518	73,581	74,147	566	0.86	1.66	11.3	11.1	96.70	99.21	163	0.156	0.141	0.114	
Baltimore & Ohio.....																
Baltimore & Ohio.....	4,535	4,539	85,040	86,974	1,934	2.27	18.7	19.2	201.49	195.59	110	0.102	0.095	0.056	
Buffalo, Rochester & Pittsburgh.....	586	586	17,402	17,360	42	0.35	29.6	29.6	153.83	158.23	215	0.170	0.163	0.078	
Central of New Jersey.....	681	684	23,721	25,799	2,078	4.3	8.76	34.8	37.7	71.91	70.91	174	0.172	0.163	0.047	
Chesapeake & Ohio.....	2,369	2,375	43,651	45,654	1,637	0.69	3.90	19.1	18.4	276.84	276.00	109	0.101	0.095	0.048	
Delaware, Maryland & Pennsylvania.....	991	985	27,593	28,411	529	0.53	2.79	28.1	29.1	136.22	136.18	110	0.092	0.085	0.050	
Delaware, Maryland & Western.....	(1)	2,257	51,791	51,635	156	0.30	22.9	22.9	214.25	220.26	409	0.083	0.083	0.050		
Lehigh Valley.....	1,442	1,442	43,359	43,359	1.65	1.72	31.2	30.0	270.97	186.84	135	0.084	0.072	0.061
New York Central.....	5,668	5,661	129,603	131,185	1,582	0.27	0.31	33.1	33.2	200.58	200.58	988	0.073	0.061	0.052	
New York, Ontario & Western.....	5,668	5,661	129,603	131,185	1,582	0.27	0.31	33.1	33.2	200.58	200.58	988	0.073	0.061	0.052	
Pennsylvania Railroad.....	4,541	4,536	148,284	148,981	697	0.48	2.00	32.9	32.9	159.98	162.21	114	0.104	0.095	0.055	
Philadelphia & Reading.....	1,120	1,127	39,014	39,326	312	0.28	0.79	34.8	34.9	101.85	102.16	118	0.116	0.075	0.060	
Western Maryland.....	661	676	8,816	10,415	1,599	2.41	18.14	13.3	15.4	114.35	121.74	114	0.112	0.063	0.056	
Total.....	26,314	647,340	650,591	3,661	-36	24.6	24.6	164.35	172.15	114	114	0.073	0.086	0.082		
SOUTHERN CLASSIFICATION—																
Atlantic Coast Line.....	4,659	4,703	28,619	28,318	306	0.67	1.08	6.1	6.0	166.73	174.66	135	0.126	0.103	0.0835	
Central of Georgia.....	1,924	1,924	9,907	10,318	411	4.21	4.33	2.3	2.2	185.69	231.30	107	0.454	0.401	0.350	
Florida East Coast.....	743	743	1,682	1,660	22	1.33	2.3	9.2	9.2	185.51	183.49	128	0.114	0.090	0.051	
Louisville & Nashville.....	5,037	5,042	46,710	46,420	-292	-0.63	9.3	9.2	185.91	185.91	98	0.057	0.057	0.057		
Mobile & Ohio.....	1,122	1,122	11,422	11,129	-293	-2.63	10.2	9.9	230.03	233.51	109	0.077	0.077	0.077		
Nashville, Chattanooga & St. Louis.....	1,231	1,231	9,975	10,110	135	1.05	0.01	23.0	23.8	162.33	168.33	110	0.082	0.082	0.082	
Norfolk & Western.....	2,042	2,059	46,973	47,004	31	0.07	0.01	23.0	23.8	162.33	168.33	110	0.082	0.082	0.082	
Norfolk Southern.....	860	863	3,227	3,277	50	0.58	0.38	3.8	3.8	87.32	98.25	215	0.166	0.158	0.133	
Seaboard Air Line.....	3,349	3,349	17,951	17,597	-354	-10.55	12.01	5.1	5.1	151.45	173.45	112	0.115	0.104	0.087	
Southern Railway.....	7,031	7,022	47,130	41,855	-5,275	-12.60	16.7	16.2	165.41	166.94	119	0.098	0.098	0.098		
Total.....	504	505	7,959	7,702	-257	-3.22	2.95	15.7	15.2	361.43	363.24	138	0.102	0.053	0.038	
Virginian.....	28,859	28,665	231,575	225,382	-6,193	-2.54	8.1	7.9	192.50	200.96	133	0.113	0.088	0.063		
CENTRAL CLASSIFICATION—																
Chicago, Indianapolis & Louisville.....	621	622	6,400	6,400	.....	.....	10.8	10.3	128.80	137.73	139	0.120	0.088	0.075
Chicago & Eastern Illinois.....	1,051	1,051	31,297	31,297	.....	.....	10.8	10.3	128.80	137.73	139	0.120	0.088	0.075
Chicago & North Western.....	1,282	1,282	25,078	25,078	.....	.....	10.8	10.3	128.80	137.73	139	0.120	0.088	0.075
Chicago & Western Illinois.....	8,108	8,108	67,401	65,873	-1,528	-2.32	8.1	8.1	153.87	144.66	130	0.116	0.108	0.089		
Chicago, Great Western & Quincy.....	1,338	1,338	65,467	65,467	.....	.....	7.0	7.0	268.51	273.31	100	0.092	0.077	0.065
Chicago, Milwaukee & St. Paul.....	10,053	10,130	61,958	61,495	-463	-0.75	6.3	6.3	248.39	257.45	105	0.089	0.080	0.070		
Chicago, Rock Island & Pacific.....	8,340	8,098	44,247	46,292	2,045	4.62	5.3	5.7	242.53	235.70	994	0.096	0.081	0.079		
Coleman, St. Paul, Minneapolis & Omaha.....	1,253	1,253	11,388	12,662	1,274	10.4	6.5	7.2	151.93	156.61	114	0.110	0.085	0.080		
Colorado & Southern.....	1,828	1,841	12,082	11,902	-180	-1.54	6.6	6.5	152.48	160.38	161	0.150	0.133	0.100		
Duluth, St. S. & Atlantic.....	627	603	3,035	2,972	-65	-1.07	4.9	4.9	725.58	81.17	133	0.160	0.147	0.106		
Great Northern.....	4,061	4,061	55,779	56,079	300	0.54	6.9	7.0	246.18	269.98	147	0.113	0.097	0.072		
Illinois Central.....	4,836	4,767	67,863	61,951	-5,912	-8.57	3.69	13.4	12.9	246.25	243.11	116	0.102	0.085	0.072	
Kansas City Southern.....	1,836	1,836	7,162	7,162	.....	.....	4.4	4.4	162.25	165.20	107	0.077	0.075	0.073
Memphis, St. Paul & Sault Ste. Marie.....	4,103	4,103	24,116	24,116	.....	.....	5.7	5.7	192.07	209.93	125	0.104	0.097	0.068
Missouri, Kansas & Texas.....	3,865	3,865	41,009	41,009	.....	.....	2.1	2.1	248.28	240.16	107	0.094	0.094	0.094
Northern Pacific.....	6,461	6,501	48,160	47,365	-795	-1.65	7.5	7.3	163.27	163.73	127	0.114	0.097	0.086		
St. Louis-San Francisco.....	5,252	5,252	30,068	29,601	-466	-1.57	5.7	5.6	165.27	166.73	133	0.126	0.109	0.110		
St. Paul & Northern Pacific.....	1,724	1,724	12,601	12,601	.....	.....	4.0	4.0	234.36	232.94	143	0.174	0.161	0.140
San Antonio & Arkansas Pass.....	1,724	1,724	12,601	12,601	.....	.....	4.1	4.1	208.35	208.35	126	0.167	0.139	0.161
Southern Pacific.....	10,554	10,556	48,368	45,041	-3,327	-7.16	3.4	3.4	189.36	197.20	402	0.091	0.082	0.074		
Texas & Pacific.....	1,901	1,944	11,101	10,839	-262	-2.41	5.8	5.6	357.43	414.97	078	0.061	0.063	0.044		
Union Pacific.....	2,519	2,781	37,998	36,223	-1,775	-4.90	4.9	4.6	357.43	414.97	078	0.061	0.063	0.044		
Walsh.....	(2)	123,030	123,030	292	1,775	1.4	6.6	6.5	257.64	257.64	100	0.057	0.049	0.038		
Total.....	200,657	201,348	1,986,433	1,969,732	-16,701	-0.84	9.90	9.78	160.82	165.91	136	0.117	0.100	0.084		
TOTAL, ALL RAILS.....																
(1) 1916 figures are for year ended June 30th—December 31st not available.																
(2) 1915 and 1916 figures are for year ended December 31st.																
(3) After consolidation with Canadian, Atlantic & West.																

Note.—(1) 1916 figures are for year ended June 30th—December 31st not available. (2) 1915 and 1916 figures are for year ended December 31st. (3) After consolidation with Carolina, Atlantic & Western Railway.

COMPARATIVE SUMMARY OF FREIGHT CARS IN SERVICE ON RAILROADS OF THE UNITED STATES—1900 AND 1916

Note.—Narrow-gauge cars excluded. Non-revenue cars excluded. Company freight excluded.	Miles		Freight equipment		Per cent of increase	Freight-cars per mile of road		Average length of haul		Per 1,000 ft. car miles		Rate per ton mile (Dollars)		Frt. cars per \$1,000 ft. earnings	
	1900	1916	1900	1916		1900	1916	1900	1916	1900	1916	1900	1916	1900	1916
NEW ENGLAND ROADS—															
Boston & Maine.....	1,787	2,252	12,300	22,834	86.974	19.3	19.2	194.81	195.50	128	102	.0068	.0055	.0412	.0360
Bangor & Aroostook.....	354	631	3,091	5,231	2,230	7.14	8.7	8.4	89.62	125.77	...	.560	.659	.0233	.01430
Maine Central.....	513	411	2,006	2,953	5,281	7.14	7.4	8.11	46.80	71.38	...	.180	.180	.0160	.0109
New York, New Haven & Hartford.....	2,008	2,004	13,116	33,972	20,856	15.901	6.5	16.9	83.36	87.03	.076	.164	.0097	.0134	.01451
Total.....	5,478	6,518	34,029	74,147	40,118	117.859	6.5	11.4	83.61	99.21	107	.156	.0093	.01264	.01174
TRUNK LINE ROADS—															
Baltimore & Ohio.....	3,179	4,539	61,708	86,974	25,266	40.94	19.3	19.2	194.81	195.50	128	102	.0068	.0055	.0412
Buffalo, Rochester & Pittsburgh.....	172	586	18,838	27,360	10,797	95.98	18.7	29.6	73.16	158.23	139	170	.0097	.00871	.00477
Central of New Jersey.....	1,476	2,375	13,653	26,384	14,902	71.97	23.4	37.7	77.88	120.91	153	.172	.0113	.0097	.00871
Delaware & Hudson.....	665	909	13,040	18,351	26,384	153.77	17.8	38.4	30.40	77.00	.402	.091	.0038	.0021	.00382
Delaware, Lackawanna & Western.....	947	955	27,287	27,812	5,525	31.95	28.8	29.1	151.00	189.35	...	.092	.014	.0056	.00808
Erie.....	2,104	2,557	46,225	51,635	5,410	11,770	21.9	22.9	194.40	220.26	101	.083	.0089	.00853	.00584
Lehigh Valley.....	1,382	1,441	34,954	43,359	8,405	24.05	25.3	30.0	188.08	180.84	135	.126	.0101	.00542	.00654
New York Central.....	4,318	5,661	79,157	131,185	52,028	65.73	18.3	10.6	142.38	144.67	144	.128	.0101	.0073	.00816
New York, Ontario & Western.....	3,480	5,668	1,620	301	51.03	12.3	12.3	10.5	129.54	162.21	991	.104	.0067	.00540	.00603
Pennsylvania Railroad.....	3,716	4,536	80,385	148,981	68,596	85.33	21.6	32.9	109.54	162.21	139	.116	.0114	.0060	.00831
Philadelphia & Reading.....	1,000	1,127	31,824	39,326	7,502	23.60	31.8	34.9	89.42	102.16	139	.116	.0114	.0060	.00831
Western Maryland.....	279	676	691	9,724	23,661	140.72	2.5	24.7	146.28	167.14	121	.111	.0038	.0065	.00635
Total.....	20,657	26,314	422,290	650,931	228,641	54.14	20.4	24.7	146.28	167.14	121	.111	.0093	.0065	.00627
SOUTHERN CLASSIFICATION—															
Atlantic Coast Line.....	1,759	4,703	5,378	28,313	22,935	426.46	3.6	6.0	121.90	174.66	...	.126	.0143	.0132	.01835
Central of Georgia.....	1,196	1,924	5,041	10,318	5,277	104.68	4.2	5.4	138.86	158.14	.107	.050	.0183	.0058	.01096
Florida East Coast.....	745	745	1,660	1,660	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Memphis & Nashville.....	3,007	5,032	23,405	46,735	23,405	98.37	7.7	9.2	163.00	183.49	.066	.114	.0090	.0071	.00758
Mobile & Ohio.....	876	1,123	5,389	11,129	5,740	106.51	6.2	9.9	195.63	233.51	...	.107	.0076	.0070	.00500
Nashville, Chattanooga & St. Louis.....	1,189	1,331	5,338	10,110	4,782	89.75	4.4	8.2	151.00	161.76	113	.126	.0096	.0113	.00880
Norfolk & Western.....	1,551	2,059	18,656	47,004	28,348	151.95	12.0	22.8	253.41	265.83	.085	.166	.0161	.0133	.01170
Norfolk Southern.....	1,747	3,863	10,317	33,574	23,257	70.82	3.8	5.1	153.32	173.45	119	.115	.0136	.0104	.01180
Salt Lake Air Line (1901).....	2,604	3,449	8,339	17,597	9,238	111.02	3.2	3.1	153.32	173.45	119	.115	.0136	.0104	.01180
Southern Railway.....	6,006	7,022	26,814	41,855	15,041	56.09	4.2	6.0	168.82	166.94	107	.098	.0116	.0083	.00916
Virginia Railway.....	505	505	7,702	7,702	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total.....	18,635	28,665	98,752	225,388	126,636	128.24	5.3	7.6	157.04	200.96	105	.113	.0119	.0088	.01002
CENTRAL CLASSIFICATION—															
Chicago, Indianapolis & Louisville.....	546	622	5,440	6,400	960	17.64	9.9	10.3	137.03	137.73	155	.139	.0141	.0088	.00757
Cincinnati, Hamilton & Dayton.....	652	780	7,838	14,026	29,510	29.06	12.0	7.8	108.96	122.58	994	.082	.0132	.0053	.00583
C. & C. St. Louis.....	1,891	2,387	15,484	29,510	14,026	90.58	8.2	12.4	169.32	169.40	994	.082	.0132	.0053	.00583
Grand Rapids & Indiana.....	582	575	3,015	3,041	26	...	...	...	90.12	95.42	140	.092	.0105	.0063	.00870
Great Northern.....	735	900	5,549	4,638	...	9.21	19.90	7.6	5.1	133.51	132.31	137	.075	.0101	.0068
Michigan Central.....	1,635	1,862	14,219	28,344	14,125	95.34	6.3	15.2	251.00	252.00	.050	.092	.0070	.0068	.00592
St. Louis, Chicago & St. Paul.....	1,306	1,755	43,967	60,397	16,430	37.37	31.5	34.4	77.95	73.05	.177	.138	.0135	.0069	.00500
P. C. C. & St. Louis.....	(3)	1,407	1,489	13,884	29,213	16,339	126.74	9.1	19.6	111.14	120.74	.056	.086	.0053	.0054
Pere Marquette.....	1,821	2,251	15,106	7,162	7,162	90.16	4.3	6.7	112.64	172.42	...	.096	.014	.0064	.00802
Rock Island.....	(3)	1,407	1,489	13,884	29,213	16,339	126.74	9.1	19.6	111.14	120.74	.056	.086	.0053	.0054
Total.....	11,895	14,061	129,005	201,361	72,336	56.09	10.8	14.9	140.14	141.17	117	.094	.0106	.0058	.00635
WESTERN CLASSIFICATION—															
Atchafalaya, Topeka & Santa Fe.....	745	11,271	27,486	64,229	36,743	133.68	3.7	5.7	349.19	315.61	.073	.079	.0079	.0065	.00976
Chicago & Eastern Illinois.....	711	1,342	8,306	32,928	16,953	203.78	11.8	20.5	147.16	153.45	132	.188	.0106	.0063	.00748
Chicago & North Western.....	5,219	8,703	40,866	59,572	18,758	61.27	7.8	8.1	151.30	144.66	108	.116	.0106	.0089	.00830
Chicago, Burlington & Quincy.....	7,546	9,468	42,287	65,467	23,180	54.81	5.6	7.0	284.87	275.31	137	.105	.0092	.0111	.0065
Chicago Great Western.....	930	1,455	5,762	10,686	4,904	73.81	5.2	7.3	301.68	275.45	.092	.099	.0081	.0070	.00851
Chicago, Milwaukee & St. Paul.....	643	1,155	3,572	6,086	4,904	84.81	6.2	7.3	301.68	275.45	.092	.099	.0081	.0070	.00851
Chicago, Rock Island & Pacific.....	3,474	8,093	17,150	46,292	29,142	169.92	4.7	5.7	213.90	262.70	109	.096	.0079	.0090	.00870
Chicago, St. Paul, Minneapolis & Omaha.....	1,557	1,753	10,233	12,662	2,409	23.50	6.6	7.7	160.55	156.61	149	.110	.0135	.0080	.00871
Colorado & Southern.....	1,762	1,841	2,979	11,902	8,923	299.53	3.9	6.5	101.00	160.28	108	.150	.0115	.0100	.01242
Duluth, S. S. & Atlantic.....	1,665	1,917	5,922	8,432	2,410	4.07	8.1	7.4	74.46	120.35	121	.109	.0119	.0054	.00718
Great Northern.....	5,418	8,052	21,484	56,079	34,959	56.09	10.8	14.9	140.14	141.17	117	.094	.0106	.0058	.00635
Illinois Central.....	3,996	4,767	12,905	20,136	72,336	128.24	5.9	7.9	153.04	200.96	105	.113	.0119	.0088	.01002
Iowa & Great Northern.....	510	836	2,238	4,591	2,238	100.00	4.4	5.0	352.30	352.30	109	.107	.0084	.0084	.0084
Kansas City Southern.....	(1)	833	5,118	4,934	...	...	...	...	267.90	267.90	103	.067	.0091	.0043	.00613
Minneapolis & St. Louis.....	(1)	597	1,646	3,066	4,417	144.06	5.1	4.5	108.70	165.26	106	.104	.0155	.0073	.01212
Missouri, St. Paul & Sault Ste. Marie.....	1,255	4,228	6,631	24,116	17,485	263.70	5.3	5.7	194.65	209.63	129	.104	.0109	.0068	.00658
Missouri Pacific.....	1,938	7,241	25,186	41,909	16,723	166.39	5.1	5.7	236.24	240.16	102	.094	.0095	.0067	.00834
Missouri, Kansas & Texas.....	1,218	3,961	25,669	31,008	16,723	149.39	4.4	5.7	298.34	240.16	102	.094	.0095	.0067	.00834
Northern Pacific.....	5,006	6,503	23,138	47,365	24,227	104.70	4.6	7.3	309.60	334.30	105	.101	.0104	.0067	.00987
St. Louis San Francisco.....	(2)	1,659	5,255	5,974	29,602	23,628	395.51	3.6	5.6	182.05	168.73	.093	.114	.0114	.0086
St. Louis, Southwestern.....	(2)	1,659	5,255	5,974	29,602	23,628	395.51	3.6	5.6	182.05	168.73	.093	.114	.0114	.0086
San Antonio & Western.....	1,287	1,753	5,366	13,304	7,918	147.01	4.3	7.6	196.38	227.94	127	.174	.0130	.0149	.01100
San Antonio, Western & Texas.....	1,287	1,753	5,366	13,304	7,918	147.01	4.3	7.6	196.38	227.94	127	.174	.0130	.0149	.01100
Southern Pacific.....	7,576	10,955	29,413	45,043	15,628	55.113	3.9	4.1	307.31	232.81	109	.107	.0062	.0049	.00957
Texas & Pacific.....	1,570	1,944	6,263	10,839	4,576	71.06	3.9	5.6	231.77	197.20	979	.091	.0093	.0074	.01030
Union Pacific.....	5,438	7,018	21,826	34,397	14,397	65.96	4.0	4.6	305.68	414.97	980	.961	.0068	.0044	.01046
Western.....	1,258	1,753	5,366	13,304	7,918	147.01	4.3	7.6	196.38	227.94	127	.174	.0130	.0149	.01100
Total.....	82,64	125,70	411,642	817,905	392,263	93.06	5.0	7.2	161.25	211.04	104	.108	.0100	.0075	.00836
Total, ALL ROADS.....	139,289	201,448	1,107,712	1,969,732	862,014	77.82	7.95	9.78	168.89	165.91	111	.117	.0112	.0084	.00857

NOTE. (1) 1916 operations of Iowa Central R. R. included in Minneapolis & St. Louis R. R. (2) Before consolidation with other companies. (3) 1916 figures are for year ended June 30th—December 31st not available. (4) 1916 figures are for year ended December 31, 1916.

that all the railways need about 200,000 new freight cars yearly, 100,000 for replacements and 100,000 to take care of the normal increase of business. Statistics compiled by the *Railway Age Gazette* have shown that from 1901 to 1915 the number of cars ordered by all the roads in this country and Canada averaged 174,895 yearly. From 1901 to 1907 the average was 205,361 yearly. From 1908 to 1915 it was but 148,238. In 1916 the orders totaled 170,054, but in the first six months of the present year, they were only at the rate of 90,000 for the year.

These figures are the things that emphasize what the Railroads' War Board has been doing, for it is with this deficiency of equipment that the car shortage is held down to only 77,000 despite the shipments of the cantonnements and all the other business that is now being offered to the carriers.

THE INTERSTATE COMMERCE COMMISSION'S FIGURES

The Interstate Commerce Commission's figures for the fiscal year ended June 30, 1916, will also bear out the remarks made above as to the decreases in quantity of equipment on the American railroads. They will also be found of interest because they indicate that there has been even a more pronounced decrease in the number of locomotives than of freight cars. The figures are to be found in the abstract of Statistics of Steam Railways issued early in the week and given elsewhere in this issue. The totals given, inasmuch as they are for the fiscal year 1916, are for a period back of the one included in the two large tables, but they are repeated here in part, because they include all the railways of the country and because they bear the stamp of authority of the Interstate Commerce Commission.

It appears from the annual reports submitted to the commission that there were 63,862 locomotives in their service on June 30, 1916, as compared with 65,099 on June 30, 1915:

Kind of Locomotive	Total 1916	Total 1915
Steam	63,578	64,835
Other	284	264
Total	63,862	65,099

The total number of cars of all classes in service on June 30, 1915, was 2,507,977 assigned as follows: Passenger service, 55,705; freight, 2,356,338 and company service, 95,934. On June 30, 1916, the total was only 2,478,159, assigned: Passenger service, 54,664; freight service, 2,326,987; company service, 96,508. These figures do not include so-called private cars of commercial firms or corporations.

The cars in freight service, exclusive of caboose cars, 2,298,263 in 1916 and 2,327,562 in 1915, were classified as follows:

Item	Total, 1916		Total, 1915	
	Number	Aggregate capacity Tons	Number	Aggregate capacity Tons
Box cars	1,024,418	36,887,105	1,041,030	36,978,004
Flat cars	136,719	4,991,377	145,191	5,225,995
Stock cars	83,487	2,690,633	86,312	2,759,536
Coal cars	899,638	42,299,287	900,780	41,287,823
Tank cars	8,828	391,176	9,512	379,415
Refrigerator cars	51,746	1,672,967	55,443	1,681,212
Other freight-train cars	92,427	4,012,990	92,294	3,913,556
Total	2,298,263	92,945,535	2,327,562	92,225,541

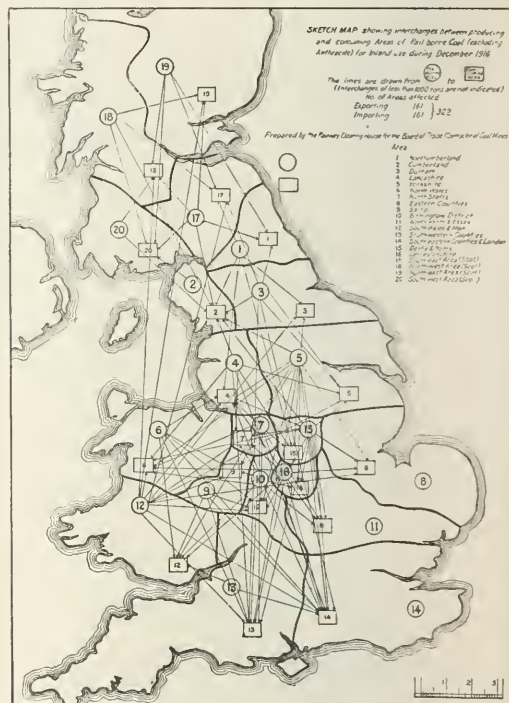
It will be noted that there have been decreases in all kinds of cars except tank and other "freight train cars," and that there have been increases, but only slight ones, in the aggregate capacities.

ANOTHER BIG RAILROAD JOB.—According to figures recently published, some six million shells were used in the operations that resulted in the capture of Messines. Reckoning these at an average weight of slightly over 100 lb.—probably the average was higher—this would represent a consumption of about 300,000 tons of steel, says the Ironmonger.

ENGLISH RAILWAYS WILL STOP "CARRYING COALS TO NEWCASTLE"

The railways in England on September 8 will put into effect a new scheme for coal handling by which it is expected that they will secure a saving of 700,000,000 ton-miles in coal transportation.

The comptroller of coal mines of the Board of Trade has recently issued an order that, effective at 6 p. m., September 8, 1917, all coal contracts are to be abrogated. Thereafter,



Official Map Indicating Effect of New Restrictions on Coal Sales

each coal-producing district may sell coal only for delivery in certain stipulated areas. It is stated that this is done:

1. "That consumption of coal should take place as near the producing point as possible."
2. "That in view of the supply facilities afforded by the main trunk lines, the movement of traffic should follow these routes wherever possible."
3. "That the movement of coal should, as far as possible, be in well defined directions; viz.: north to south, north to southwest, north to southeast, east to west."
4. "That an area producing less coal than suffices for its own need should not send any portion of its coal to other areas. That an area producing more coal than it requires for the consumption within the area itself, should distribute the balance to adjacent or convenient areas."

The comptroller of coal mines estimates that this arrangement will effect a saving of 700,000,000 ton-miles in the transportation of coal by the railways.

GERMAN CROWN PRINCE'S SPECIAL TRAIN.—A Hanover Socialist paper expresses anger at the fact that the Crown Prince, when called to Berlin, used a special train, whereby the line from Hanover to Berlin was blocked for a whole night. A number of Reichstag Deputies had to wait the night inside Hanover Station to let the special pass. Such a fact, the paper declares, must be considered by the Socialists of the German Empire as a slap in the face of democracy.

By-Products of an Apprenticeship System

The Tremendous Value of These Is Fast Becoming Apparent on the Atchison, Topeka & Santa Fe

By John H. Linn

A SUCCESSFUL manufacturing plant is established, equipped and manned for the purpose of producing a certain definite product. The principal effort of each management is directed towards the perfection and marketing of this primary product; but in every case certain opportunities arise whereby with but little additional effort or expense other secondary products, known as by-products, may be produced, thus greatly augmenting the net profits of the plant and making it possible to produce a better primary product at much less expense than if the material going into these by-products were allowed to accumulate as waste. For example, in the manufacture of steel such by-products are produced as ammonium sulphate, benzol, naphtha and slag. The primary purpose of a packing house is to produce edible meats, but to these are added such by-products as leather, pepsin and other medicines, glue and glycerin, oleo, axle grease, soap, shoe polish, hair for mattresses and plaster, combs, hair pins, violin strings and fertilizer.

The by-product may be very much unlike the primary product. One of the by-products of carborundum, the hardest abrasive made, is graphite, very valuable as a lubricant. In many cases, were it not for the income derived from these by-products, the primary product would be unable to meet its competitors in the open market. In this age of business thrift and industry everything must count, must be conserved, must be made to produce results; every atom must be utilized and devoted to some useful purpose. Today we have so many and such important by-products that we really do not think of them as by-products, and fail to realize that they are made from material which would otherwise be wasted, from opportunities which would otherwise be lost.

So, too, in the developing and training of skilled mechanics other results are produced, which, like the by-products of the manufacturing concerns, greatly augment the net profits arising from the scheme. The *Railway Age Gazette* has often referred to the modern apprenticeship system of the Santa Fe and the remarkable results obtained under the guidance of the supervisor of apprentices, F. W. Thomas. Since this road has given such attention to its human element, particularly the young men being trained for the mechanical department, it is interesting to know more of the results actually obtained. First let us consider the purpose of the apprentice organization, the primary product to be produced.

PRIMARY PRODUCT

On the first page of the first edition, and also of the latest edition, of the pamphlet which the supervisor of apprentices has issued describing the apprenticeship system of this road, we find these words, taken from remarks by Mr. Purcell: "Our object is not to make mechanical engineers, but to make first-class skilled mechanics, to recruit our shop forces with men—trained, educated, 'Santa Fe way.'" This positive statement from the founder of our apprenticeship system, the present head of the mechanical department of the road, leaves no doubt as to the purpose of the apprentice organization, no doubt as to the primary product the apprentice instructors are employed to produce—first-class skilled mechanics, trained and educated "Santa Fe way." Whatever else they may be able to do; whatever other results they may accomplish, they never lose sight of this primary purpose for which the department was organized—the developing and locating of the skilled mechanic for the shops.

During the past decade, through its apprentice department, the Santa Fe has greatly improved both the quality and quantity of this product. Over 700 skilled apprentice graduates are at present working in its shops, at points where they are most needed. At its largest shop, in spite of the present demand all over the country for mechanics and the high wages offered them, it has not been necessary to employ a mechanic from the outside for over 2½ years. This condition is due to the intense loyalty of these apprentice graduates, evidenced by the large per cent remaining in service. The value of this product alone would more than justify the expense and effort of the apprentice department. The mission of this article, however, is not to discuss this primary product, but instead, the by-products which are produced in connection with the work of this modern apprenticeship system.

Just as the manufacturing industries have long since learned that in the production of the primary product certain opportunities arise whereby with little additional effort or expense, secondary products known as by-products may be produced, so in the developing of these skilled mechanics opportunities arise for producing other valuable results, a few of which I shall mention here. No attempt will be made, however, to discuss them in the order of their importance, nor shall I be able to mention them all. Moreover, many of them will overlap and be intertwined or interwoven with each other, or with the primary product, so as to be hardly distinguishable.

THE PROMOTED GRADUATE

Let us first consider the promoted graduates, very rapidly increasing in number. As the system of apprentice instruction has been broadened in scope and rendered more efficient; as the increased opportunities given the apprentices have attracted a better class of boys with which to start; as the apprentice boards have studied more closely the fitness of each boy and weeded out the undesirable material at an early date, thus making room for more and better boys; as the apprentice instructors have entered more closely into the real life of each of their boys and learned more of their ability and capacity, more of their talents, active and dormant; as they have passed on to their local officers and to the central apprentice organization the knowledge they have thus gained—more and more of these graduates have been given positions of trust and responsibility. These young men have made good and justified the confidence placed in them, and proved to the management the value of the apprentice instruction and the reliability of the recommendations of the apprentice organization.

Today there are over 150 of these graduates occupying official positions, some of them of no little responsibility. All of these young men completed their apprenticeships within the past decade. Only those who were graduated during the past five years received the benefit of full four years of the modern apprentice instruction. None of them received the full and complete instruction and training and experience given the apprentices today, for the department is constantly improving its courses. What may not be expected of these boys in another ten years, to what heights may not some of them climb, what great things may they not do for the Santa Fe and the community in general?

When you think of all this, can you conceive the magni-

tude of this work, or realize to the full extent the value of the by-product of this organization? Surely it must be a source of great pleasure and satisfaction to the management to know that whenever a man is needed for this, that, or the other position, someone, by nature endowed, and by training fitted, is ready to fill this particular position, and better still, another is ready to step right into the place thus vacated.

Furthermore, the production of this by-product, instead of interfering with the production of the primary product, the skilled mechanic, really increases both the quality and the quantity of the primary product, for more and better boys are attracted to the apprenticeship system, and more of them remain with the company after graduation, knowing that no one else could offer them better treatment. They realize that if they are to receive promotion they must prove their ability by taking full advantage of the opportunities offered them. Just as the college graduate is loyal to his alma mater, and has a feeling of fellowship for the graduates and underclassmen of his school, just so these promoted graduates are loyal to the apprentice department, and have a feeling of fellowship and friendly interest in all other graduates and in all apprentices, and take pleasure in striving to better their condition.

PREPAREDNESS AND WATCHFUL INTEREST

The next by-product is closely related to the one just mentioned, in that it gives evidence not only of the ability of these young men, but also of the full interest taken in them by the department. I refer to the last three Ryerson scholarships awarded by the Master Mechanics' Association having been won by Santa Fe apprentices. These scholarships, which by the way are sufficient to pay necessary expenses for a four-year college course in mechanical engineering, were open to all young men in the United States, particularly those having a high school education and at least two years of shop training. The fact that Santa Fe apprentices have won this coveted prize three times in succession, is no small honor.

But proud as the company should be of these winners, still prouder should we be of the conditions which brought about those victories. Without a doubt there were many capable young men on other roads. It is possible some of these may have been as talented and possibly as fully prepared as were the winners, but the Santa Fe apprentice boys were not only capable, talented, and prepared, but through the apprentice organization and its constant watchfulness for good things for its young men and for the company, they learned that these scholarships were to be awarded, and not only received full information regarding the contest, but the instructors took pains to pick out the most promising and get them lined up for the examination. This same spirit of preparedness and ever-watchfulness is in evidence in many other phases of this work, and is giving the Santa Fe returns which, though difficult to estimate, are of such value as to make this by-product worthy of consideration.

TECHNICAL WORK OF SCHOOL INSTRUCTORS

Another by-product worthy of mention is the technical work of the school instructor. As one of the few technically educated men in the shop, he is called upon for advice or suggestions on matters of great importance. His special duties vary from making a design for a new shop whistle, to determining how many cars a new type of locomotive will pull over Tehachapi. The apprentice school rooms are fast becoming emporiums of mechanical information, to which everyone in search of mechanical or technical information, of no matter what nature, is urged to come and partake of the waters that flow freely. The fact that more and more are constantly taking advantage of this invitation proves that the fountain is by no means dry. It must be a source of great pleasure to the master mechanics to have on their staffs school instructors who can be trusted with matters of a con-

fidential nature and depended upon to work out a solution of all technical questions that may arise. In addition to his special duties the school instructor generally has charge of all the shop drafting, and looks after all the shop blueprints. His entire salary is charged to the apprentice department, but were it not for him, someone else would have to be employed to look after much of this work. It does not require much of a calculation to realize something of the value of this by-product.

WORK OF SHOP INSTRUCTORS

There is also a by-product from the work of the shop instructor. Since he works in harmony with the foreman, he is thoroughly familiar with his duties. If for any reason the foreman is absent, the shop instructor is ready to take his place. Furthermore, since the shop instructor is held responsible for the thorough instruction of the apprentices, and for all work spoiled by the apprentices, the foreman has more time to devote to other duties. Since the shop instructor knows what boy is best fitted for performing any job that arises, and also knows what boy needs the experience offered by the job in question, and can best give the instruction when the boy first starts on the job, the foreman usually assigns the work to the apprentices through the shop instructor, thus being relieved of any further trouble in the matter.

Every one likes to do what he can do well. No school is disorderly wherein the pupils are interested in their work. Just so in the shop. Through the work of the shop instructor the apprentices are kept interested in their work, and as a result little effort is needed to keep them busy, and as they are constantly busy the other mechanics get the fever, for industry like idleness is contagious, and thus the foreman is relieved of the necessity of devoting so much time to driving his men. If it were not for these shop instructors it is needless to say there would be need of greater supervision in most of the shops. As has been stated, the salary paid the shop instructor should be considered not an expense, but the most profitable investment that can be made. He is the most necessary part of the apprentice organization.

SHOP OUTPUT OF APPRENTICES

The shop output of apprentices is perhaps the most visible by-product of the department. The systematic instruction given an apprentice boy from the day he enters his apprenticeship until his graduation produces a much greater output than one would expect. On many jobs his output exceeds that of the ordinary mechanic. He would excel the latter in a baseball game or football game, in a track meet, or in any physical contest requiring strength, agility or quickness of muscle and mind. He is more ambitious and more desirous of outdoing the other fellow than is a man of maturer age. Is it any wonder then that when properly instructed, and properly interested in his work, he can often turn out more work and better work than the ordinary mechanic? Moreover these apprentices are taught the latest and most up-to-date methods of performing each class of work, and from the start are not only taught habits of industry, but also made to realize that time is fully as important as material, and thus made to do their work with the minimum waste of either material or labor. The results have shown conclusively that the extra work turned out by these boys while apprentices, more than justifies the entire cost of their instruction.

PRESENT INDUSTRIAL SITUATION

Thanks to its apprenticeship system the Santa Fe is unusually well prepared to meet the drain which the present war situation is making on the shop forces of all the railroads and manufacturing concerns in the country. Should it be necessary to employ raw recruits to fill the places of those entering government service, the system of instruction already in vogue in training its apprentices can be used to

give necessary instruction to other men who may be employed.

EFFECT ON OTHER EMPLOYEES

Another by-product of the department is the improvement in the general moral tone of the shop. Many of the requirements made of the apprentices have had a very wholesome effect on the other shop men. They are more regular and prompt in reporting for work, more particular about the quality of the work they turn out, more desirous of learning the latest and best methods of performing their work, more willing to pass on to others the benefits of their experience, more confident in the management, and more loyal to the Santa Fe. From the fair treatment at all times demanded for the apprentices, there has gradually come about a better treatment of all the men in the shop. There is less of the old time raw-hiding spirit and more recognition that "a man's a man for a'that, the rank is but the guinea stamp, the man's the gowd for a'that."

EFFECT ON LIVES OF APPRENTICES

In conclusion I wish to mention one other by-product, one more important than any of the others, yet closely intertwined with all the others, and very necessary to the full enjoyment and development of each of the other products. I refer to the influence exerted by these fatherly and companionable instructors upon the lives of the young men in their charge. The instruction and counsel given them, the example set before them by their own conduct and daily life, has a large influence in molding the habits and ideals, the am-

son a Marconi, a Thomas Edison, or a Matthias Baldwin. What a glorious thing to have a part in the development of such a life; what an awful thing to feel that the possibilities of any life have been blighted by any act or shortcoming of ours. You have similar boys working with you. Are you giving them the best that is in you? Do you not owe this to them and to the company by whom you are employed? Surely, there is no greater opportunity for usefulness than the development and improvement of the human element. Does not modern apprenticeship pay? Is it not well worth the effort?

RAILROADING BIG GUNS INTO FIRING POSITIONS

By Our Special European Correspondent

The use of guns greater than ever dreamed of before this war, has given rise to the problem of handling them effectively, of transporting them from factory to army front and of transporting them from place to place on the front according to battle conditions. A big gun is a white elephant if you can't handle it. It is a "tank" that won't roll. If the enemy breaks through your trench lines two, four or six kilometers, and does the job in a smashing, hurry-up fashion, he is sure to take these guns that are the very life and heart of modern defense unless you have some way of getting the guns away quickly.

Because of its difficulty, it has become more of a railroad



Official Photograph from the Italian Navy Department

Unloading 255 Mm. Guns at the Front

bitions and aspirations of these young men just entering into manhood.

Someone has said that the greatest thing one human being can do for another is to help that individual become an independent self-sustaining member of society, that the ability to make a good living and to support those near and dear to us, is the beginning of all virtue. The apprentice department of the Santa Fe is doing this, not for one, but for many. Moreover, they do not stop at this. They are helping to mold the characters of the boys and increasing their desire and capacity for service to others. The work really brings the instructors very close to each boy. Unless they can win his confidence, and inspire the best that is in him, their work will be in vain.

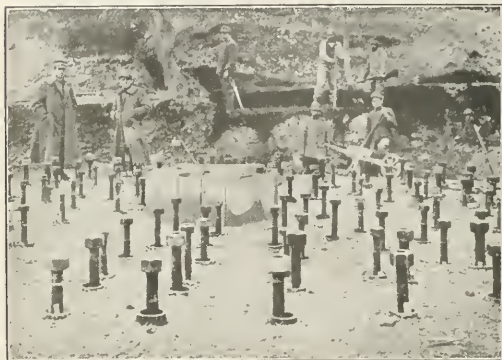
What a world of opportunity for achievement in the army of over a thousand boys now in these apprentice schools. Who knows which of them will develop into a future Steven-

son an artillery task to save heavy guns, or to rush them forward to new positions if the enemy is being beaten back. In the old days before this war the handling of artillery pieces was done by strong horses or mules, but in those days a five-ton gun was considered the heaviest possible weight of a piece intended for field operations, and the field guns averaged two, two and a half to three tons.

Today there are thousands of guns on every army front of the various nations ranging in weight from 50 to 50 tons, and many dozens of the giants that weigh from 50 to 75 tons. The projectiles of some of these guns weigh a short ton. During the worst month of the fighting at Verdun no less than 500 trains composing 25,000 cars carrying 10 tons each of projectiles were required by the French. The Germans are estimated to have used there 3,000 cannon of a total weight of 60,000 tons, and the position of many of these cannon had to be constantly shifted to prevent their destruction by

French artillery fire or to answer the changes of the battle line, covering at first a gradual advance of 12 miles and later a retreat over the same ground.

In the early part of the war, because of the lack of proper facilities for handling rapidly even the heavy guns then existing, it would take months to get guns into position, particularly during rainy weather when the roads were deep with mud. In the French and Italian mountains the so-



Official Photograph from the Italian Navy Department.

Building a Gun Base with Railroad Connection—the First Stage

called mountain howitzer, strapped to the back of a mule, was about the only rapidly moving gun used. I have seen in the Italian mountains guns of 149 millimetres calibre placed on summits of 2,000 to 2,500 metres which had required three months of time and a big gang of 1,800 men, working in relays of 600 each, to move the gun from a valley some 15 miles distant.

In this same early war period the biggest guns available and those of the longest range—15 to 24 miles—were the long-barrelled marine guns of the French and the Italians.



Official Photograph from the Italian Navy Department.

The Second Stage

But while they were sorely needed, there were no facilities to carry the guns within close firing distance of the enemy, or at least there was the constant danger that if the guns were carried forward and their location discovered by the enemy artillery, the guns would be lost because of the lack of means to shift them to new positions. For this reason the marine guns of the Italians, their 240 millimetre ones weighing upwards of 15 tons, had to be kept in reserve far behind the front for defensive purposes.

At this period of the war, before the present vast network of railway lines was built purely for war uses, the flat cars used for artillery transportation were of the most primitive description. Due to the European principle of building flat cars of a uniform type, different types of cars being objected to as obstacles to the rapid and economical handling of freight, the average car was not fitted for big gun transportation. The very old cars averaged 18 feet in length and were just strong enough to carry from 8 to 10 tons. One of the exceptions in recent years to this car type was that found on the Northern Railway of France, where the ore cars were 50 feet long and built to carry 40 tons of weight. It was such cars as these that the French used in railroading their marine guns during the fighting along the Yser and the Meuse some 18 months since.

When it was gradually discovered that big guns were not intended merely for battle ships and forts, that the Allies would have to use them as the Germans were using them, quantities of these heavier guns were built, and the problem of transporting them was solved.

Formerly the body of the gun was wholly dismantled from its carriage and laid flat on a separate car. At present and for some time past, it has been the practice to load the 20-ton guns on a single flat car of the strongest type avail-



Official Photograph from the Italian Navy Department.

The Gun Base Nearing Completion

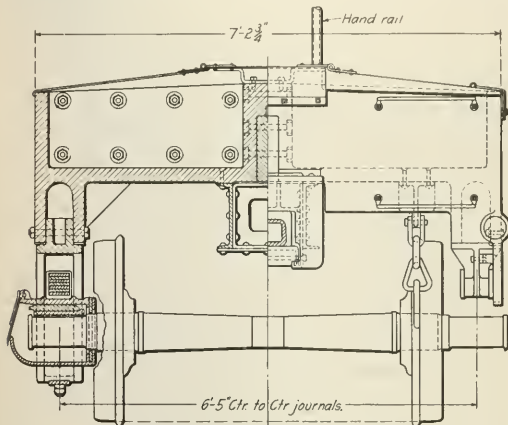
able, with extra supporting trucks, and the guns of 30 to 40 tons on two separate cars, fastened together by a single overhead steel platform on which rest the gun and gun truck. The same system is used with the 50-ton guns, though in this case all-steel frame cars are being specially constructed for this particular use. The use of two different short cars hooked together appears to help in the turning of curves. One of the most imposing sights witnessed by civilians is that of these big guns as they pass along the railway. At stations where halts are made great crowds gather, and little children clamber upon the gigantic pieces to thrust immense bouquets of flowers into the 15-inch cannon mouths.

When the train carrying such pieces arrives near the front, the process of placing the jumbo in position begins. This is generally carried on at night and with the utmost secrecy. The men of the railroad corps must accompany the gun to its final position, building a permanent track thereto. The way the job is done on the Italian front is shown in the photographs that accompany this article. After the revolving turn-table bed for the gun is prepared, the gun is slid on strong hand cars into position. While the job of removing the gun to a new position is not a light one, it is no longer an impossible one, thanks to the rails.

SCALE TEST CARS

The Louisville & Nashville has placed five scale testing cars in service, each of which is provided with an auxiliary car to afford living and working quarters for the scale testers while on the line. These cars have been assigned to scale testers, each of whom is responsible for the accuracy of the scales on a certain defined district of the railroad.

The scale cars are of the modern two-axle, short wheel-base type, and weigh 60,000 lb. The length of the body is 12 ft. 6½ in., the wheel base is 6 ft. 6 in., and the height from top of rail to top of the running board is 5 ft. 4¾ in.



End Elevation and Section of the Car

The car is entirely of iron and steel. The body consists of four box-shaped cast iron members which were accurately machined and drilled to be bolted together on the longitudinal and transverse center lines of the car. To insure good alignment and proper stiffness the body is reinforced, along the longitudinal center line just above the steel center sill by a steel bar 12 in. high by 4 in. wide extending the entire length of the car and fitting into a recess formed by offsets in the adjoining faces of the cast iron sections.

These four cast iron boxes forming the body of the car are designed to hold 108 50-lb. weights. The car is covered by a roof made of 3/16 in. steel plates arranged to provide



The Test Car with Its Auxiliary Car

a running board along the longitudinal center line of the car and also to provide for trap doors opening into the compartments of the car body for the removal of the test weights.

The interior of the auxiliary or quarters car is divided into three compartments, a kitchen and living room at the platform end, a bedroom in the middle, and a workshop at the far end. The cars are supplied with all necessary appurtenances for the living quarters and the workshop is equipped with a work bench, a forge and anvil, a box for extra test weights and other tools and equipment of use to the inspector.

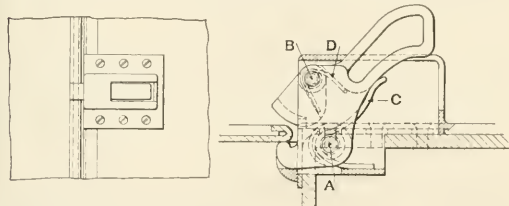
These scale and auxiliary cars are being used by the in-

spectors in making regular trips over the assigned territory for the periodic inspection and test of all track scales of the railroad and also the track scales of private owners adjacent to the line in all cases where weights are accepted by the railroad for billing. By following a regular route it is anticipated that the inspectors can cover the territory every 60 to 90 days. In addition to the testing and inspection of these scales the inspectors are instructed to make all adjustments and repairs on company scales except when they are in need of a general overhauling. Inspectors are also required to examine and test all freight house and baggage scales at least once each year. The condition of each scale tested is reported on a form designed for the purpose, one copy of each report going to the superintendent, one to the superintendent of machinery and one to the chief scale inspector.

Special instructions are given to the trainmen for the proper handling of this special equipment. These cars must always be hauled just in front of the caboose and on arrival at terminals must be set off where they will not be subjected to unnecessary switching. Under no circumstances are they to be handled in switching other cars in the train.

LOCK FOR VESTIBULE TRAP DOORS

In the June 14, 1916, issue of the *Daily Railway Age Gazette*, was published a description of the Universal trap door which was manufactured by the Transportation Utilities Company, in connection with which was shown a special type of door latch and wedge lifter. A new type of door latch, which performs the same functions of latch and lifter, has recently been developed, for use with this and the National trap door, by the Tuco Products Corporation, New York, successors to the Transportation Utilities Company.



Foot-Operated Vestibule Trap Door Latch and Starting Device

This latch is much simpler than the one previously described, being foot operated and self contained.

By referring to the drawing it will be seen that the moving parts consist of the foot release lever, the latch and two springs. The release lever, which is pivoted at *A*, contains the latch and latch spring *D*. The latch is pivoted at *B* and when the trap door is closed, is forced back to permit the door to pass, against the tension of the latch spring. As soon as the door closes, the spring again forces the latch out to the position shown in the drawing. In opening the door, the latch itself is not moved. By stepping on the foot lever it is forced down against the tension of spring *C*, carrying back the latch with it, the whole moving about the pivot *A*. As the upper end of the lever is forced down by the foot, the lower end of the lever, which extends under the edge of the trap door, moves up, thereby starting the door. This serves to insure ready operation of the door, should it become frozen in place or stick from any other cause.

The design of the foot lever is such that no special care is required in its operation as a downward pressure exerted on it with the foot, no matter at what angle it may be applied, serves to operate it. The operator is thus enabled to so place himself that his leg will not be struck by the edge of the door as it swings up.

General News Department

The Baltimore & Ohio has installed telephone train despatching between Wheeling, W. Va., and Holloway, Ohio.

The Gulf Coast Lines have granted bonuses, amounting to about ten per cent, to employees not connected with labor unions. The bonus will be paid quarterly beginning October 1.

In the Federal Court at Fort Smith, Ark., the United States district attorney has filed suit against A. L. Mills, receiver of the Fort Smith & Western, alleging six offenses against the provisions of the Adamson "eight-hour" law.

Thomas F. Molloy, of the accounting department of the Baltimore & Ohio, has been transferred temporarily to the department of food administration, at Washington, to assist in formulating a system of accounts for the food control board.

In a fire at Northampton, Mass., August 6, the freight house of the New York, New Haven & Hartford and the Boston & Maine was destroyed, together with 12 loaded freight cars and a large quantity of merchandise; estimated loss, \$75,000.

The United States Civil Service Commission announces examinations, September 5, for junior civil engineer and for junior architect, to fill places in the Division of Valuation, Interstate Commerce Commission. Applicants must be between 21 and 36 years old, and the salaries are from \$1,200 to \$1,680.

The twenty-fifth annual meeting of the Society for the Promotion of Engineering Education was held in Washington, D. C., on July 6 and 7. The program was devoted to the general topic: "The Relation of Engineering Schools to the Government During the War." Among the speakers were Hon. Newton D. Baker, secretary of war, and Gen. W. M. Black, chief of engineers, United States army.

Investigation as to the cause of the conflagration, which destroyed the freight house of the Cleveland, Cincinnati, Chicago & St. Louis and the New York Central at Cleveland, Ohio, mentioned in the *Railway Age Gazette* of July 27, has failed to develop the origin of the fire. The loss on account of the building has been placed at \$21,398, and the estimated loss on account of the contents which were destroyed is \$25,000.

The management of the Constitutional Railways of Mexico (the National Railways) has established a general purchasing agency at Houston, Tex. The work of building new cars is progressing rapidly in the shops at Agnas Calientes and the City of Mexico. It will be necessary, however, to buy in the United States large quantities of iron and steel fittings for the cars, including wheels. An enormous tonnage of new rails will be needed to place the 8,000 miles of track that comprise the Constitutional Railways in fit condition for traffic. The Mexican government has placed a large order for rails with the Monterey Steel & Iron Company.

Press despatches from Bainbridge, Ga., report that no trains are running on the Georgia, Florida & Alabama Railway, every engineman, conductor and brakeman having resigned. Threats of a strike were made some time ago, and an injunction had been granted in which all employees were enjoined from striking or taking a strike vote; or from reporting to their national organizations, or any other persons or corporations, the statement that any strike had been called; but the men are claiming that they have not disobeyed the order of the court; they are simply resigning as individuals. This road, extending from Richland, Ga., southward to Tallahassee, Fla., 132 miles, with an extension 50 miles farther to Carrabelle, runs two passenger trains daily each way over the greater part of its line. For 26 miles on the north end, the 50 miles on the south end, there is only one passenger train a day, each way. A later despatch reported the resumption of train service.

The value of efficient co-operation between the War Department and the railways in the handling of troops is illustrated by the facts, regarding the way the men in the officers' training

camp at Fort Sheridan were brought to Chicago last Saturday for the parade of Chicago's quota of registered soldiers. The bringing of the men from Fort Sheridan involved the movement over the Chicago & North Western of 4,000 troops a distance of 26 miles; and the whole number were handled the entire distance in one hour and twenty minutes. The North Western's heavy regular suburban business was moved over the same tracks meantime, without any disturbance of its schedules. The men were carried in five trains, making an average of 800 per train. The first train left Fort Sheridan at 6:45 a. m., and was in the station in Chicago at 7:26 a. m. The second left Fort Sheridan at 6:58, thirteen minutes after the first, and was in Chicago at 7:58. The third left at 7:09, only eleven minutes behind the second, and reached Chicago at 7:57. The fourth started at 7:21 and arrived at 8:09, and the fifth started only seven minutes behind the fourth, at 7:28, and arrived at 8:23. The trains were loaded one at a time; and the fact that only seven to thirteen minutes elapsed between their times of departure indicates how expeditiously the loading was done. The cars in every train were so numbered as to show exactly what companies were to use them; and the men, who were marched to the trains in military formation, were all advised in advance as to what the numbers of their cars would be.

Increase in Coal Consumed by Railways

According to a report issued by the United States Geological Survey, the American railroads in 1916 used 135,000,000 tons of bituminous and 6,735,000 tons of anthracite coal. This is an increase of 14,000,000 tons, or 11½ per cent in bituminous, and of 535,000 tons, or 8½ per cent in anthracite. The western roads consumed 6,500,000 more tons than in the year before, an increase of 15 per cent., and the increase for the eastern and southern roads was 11 and 5.1 per cent, respectively. The coal consumed by railroads was 27 per cent of the production of bituminous coal in the country, and 7.7 per cent of the anthracite production.

Railroads to Help Army Cantonments

Fairfax Harrison, chairman of the Railroads' War Board, has authorized the following statement: "To facilitate the movement and prompt delivery of materials for the construction of army cantonments the Railroads' War Board has assigned C. E. Denney, assistant to the president of the Nickel Plate, to the Quartermasters' department in Washington. During the period of construction Mr. Denney will make his headquarters in the office of Colonel Littell, where he will keep in touch with all phases of the construction work, and furnish advance information to the commission on car service of the Railroads' War Board concerning the government's orders and the number of cars required to fill them."

Further Increases in Pay

The International & Great Northern recently granted wage increases to approximately 1,000 shop employees, which will add \$140,000 annually to the company's payroll.

The Great Northern has granted wage advances to employees in its mechanical department, most of which were retroactive in their effectiveness. In the car department monthly employees received a 10 per cent advance, effective May 1, and men employed by the hour a 3-cent increase, effective May 1, and 2 cents additional, effective July 1. Machinists at Minot, N. D., and east, received a 7½-cent increase, effective May 1, and west of Minot 5½ cents, effective May 1, and 1 cent additional, effective June 20. Machinist apprentices were granted 2 cents an hour additional, and machinists' helpers a minimum wage of 27 cents an hour, effective May 1. Boiler shop employees were awarded a 5½-cent increase, effective May 1, and 1 cent an hour additional, effective June 1; tank and paint shop employees, 3-cent increase, effective May 1, and 2 cents additional,

effective July 1; shop laborers, an increase in wages of 2½ cents, effective June 1; clerical help, 25 per cent, effective May 1; tin shop employees, first-class, 5½ cents, effective May 1, and 1 cent additional, effective June 1; second-class, 3 cents, effective May 1; shop superintendents, \$20 per month, effective June 1; blacksmiths, 5½ cents to 10½ cents per hour, effective June 1; and various shop foremen, approximately \$20 a month, effective May 1. About 7,130 men are affected by the increases.

Railway Returns for June

The Interstate Commerce Commission's partial summary of railroad revenues and expenses for the month of June, 1917, based on returns for 153 roads, operating 186,000 miles, shows an increase in net revenue per mile from \$433 in June, 1916, to \$474 in June, 1917. Increases in net operating revenues are shown by the roads in eastern, southern and western districts. For the six months ending with June the same roads show an increase in operating revenues from \$1,326,187,000 to \$1,489,248,000, an increase in expenses from \$905,687,000 to \$1,065,281,000 and an increase in net operating revenues from \$420,499,000 to \$423,966,000. The increase in net revenue per mile was from \$2,264 to \$2,275. The roads of both the southern and western districts show increases in net revenue per mile for the six months, while the eastern roads show a decrease.

The Union Pacific Will Relocate Ames Monument

On account of a change in the line built for the purpose of shortening the road and for cutting down the grade, the monument erected 37 years ago to the memory of Oakes Ames and Oliver Ames, the builders of the Union Pacific, was left standing nearly five miles from the new tracks. The monument is built of granite in the form of a pyramid 60 ft. sq. at the base and 60 ft. high. It will be taken down a stone at a time and carried on wagons and stone-boats across the five miles of mountain to its new site just east of the station at Sherman, Wyo. On one side is a bronze medallion of Oliver Ames, and on the other a medallion of Oakes Ames. At the same time that the monument is being moved to a new pedestal the road is now driving a second tunnel under the mountain at the top of Sherman Pass as a part of the project to complete the double-tracking of the Union Pacific.

1,898 Miles in 24 Hours

At the Sheephead Bay trotting course, New York City, August 1 and 2, a Chalmers six-cylinder automobile was run around the two-mile course 949 times, 1,898 miles, in 24 hours, equal to 79.083 miles an hour, including stops. No human being has ever traveled so many miles in that length of time on the face of the earth, and no aviator has made any record at all for any such long distance. This distance is about equal to that from New York to Denver by the Lincoln highway. In the first hour this car traveled 83 miles, and in the twenty-fourth hour over 81 miles. All former records for 100 miles were beaten, this distance having been made in 70 min. 46 sec.

The car was driven by Messrs. Dawson and Cardham; Dawson for about 19 hours, and Cardham 5 hours. Twenty-two stops were made, consuming 35.6 minutes.

The motor which made this remarkable record is a regular stock Chalmers motor, 3¼-in. bore by 4½-in. stroke, with a piston displacement of 224 cu. in.

War Service Census of Railroad Workers Taken

Under the direction of the Railroads' War Board, every road in the United States is taking a census of the men employed by it, with a view to assisting the government in determining who should and who should not be exempted from military service. The regulations of the war department provide that "there can be no exemptions by classes, but each individual case must be taken up and determined upon its own merits, having, of course, consideration for the maintenance of the national interests as provided by law." The Provost Marshal General has advised the Railroads' War Board, however, that "it is the policy of the administration to so execute the 'selective service act' as not to unnecessarily cripple any industry."

The census being taken by the railroads will show the men who are married and those who are not, with details as to those dependent upon the married men. A second classification

will show those who can be replaced either by men inexperienced in railroad operation, or by women, and who therefore may be relieved from the service without embarrassment. The railway lists of those, who, it is believed, should be released from military duty are to be prepared in detail for each district. With the lists will be affidavits setting out the facts in detail subscribed to by the immediate superior officer, and certified to by the superintendent or head of the department in which the individual is employed. The railroads will make direct application to the exemption board for the exemption from military service of all employees who, as shown by the list and affidavits, should be released from military duty under the terms of the selective service law.

Southern Pacific Wage Negotiations

The strike order of train and engine men on the Pacific system of the Southern Pacific has been withdrawn, and the road is in conference with grand officers of the brotherhoods. The prospects of settlement are said to be good. The more important contentions are: (1) Claims for continuous time at certain terminals; this is a technical interpretation of the engineers' schedules and involves points previously considered. (2) Application of seniority rules. (3) Restricting use of crews en route in road service and under pay from helping trains at established helper terminals where helper crews have a daily guarantee. (4) Claim for full time when not available for duty on account of the operation of the sixteen-hour law. (5) Placing all extra men at helper terminals and other outside points on a daily guarantee. (6) Switching restrictions for crews in road service. (7) Duplicate payments and minimum day feature. (8) Full crews on engines with steam in boiler when being towed in trains.

Wage Increase for Southeastern Shop Employees

The wage controversy between the southeastern railroads and their 25,000 federated shop employees, which has been in progress since February 20, has been settled, except for the adjustment of a few details, by a decision of Secretary of Labor William B. Wilson, to whom it was referred, after mediation by a representative of the department had failed. Secretary Wilson's decision provides for an increase of 8½ cents an hour to mechanics and specialists, and 6½ cents for all other men represented. The railroads had previously agreed to give the eight-hour day and 6 cents an hour. Car inspectors and repairers, train car repairers, train air brake repairers, safety appliance maintainers, oilers and packers and all others employed in the car department, and for whom an eight-hour day had not already been agreed to, under the decision will have their basic day reduced two hours per day, but in no case shall the basic day be less than eight hours nor more than ten hours a day, and they shall be paid time and one-half for overtime as per overtime rules already agreed to.

The secretary's decision also included the following:

"None but mechanics or apprentices, employed and paid as such, will be assigned to do mechanics' work as per special rules of each craft, except at small outlying points where unimportant emergency jobs are required. Helpers will not be advanced to the detriment of mechanics. This rule shall not apply to foremen.

"It shall be definitely understood that the adjustment of claims for injuries received is one of the grievances that may be taken up for adjustment under the rules governing grievances.

"The request of the men that one sheet metal worker be employed to every five machinists shall be investigated by the management, and where there is sufficient work at any point to keep one employed a reasonable amount of time, a sheet metal worker will be employed without reference to the number of machinists employed.

"The request of the men that all electricians be paid on an hourly basis is denied. The offer of the managers to establish a minimum rate of 42 cents an hour for men employed on the hourly basis is accepted, and the increase for men employed on a monthly basis will be \$15 a month."

He also denied certain other requests of the employees.

The railroads were represented in the negotiations by a managers' committee, of which John R. Gould, superintendent of motive power of the Chesapeake & Ohio, was chairman.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE, 1917—CONTINUED

Average mileage during period.	Name of road.	Operating revenues.			Operating expenses.			Net railway operation.	Railway accruals.	Operating income (or loss).	Increase (or decrease) comp. with last year.		
		Freight.	Passenger.	Total (inc. misc.)	Traffic.	Trans- portation.	Miscel- laneous.					General.	Total.
900	Lake Erie & Western.....	360,407	\$4,183	\$23,918	\$85,088	\$80,359	\$14,859	\$16,454	\$460,994	\$562,923	\$30,000	\$3,228,864	\$342,265
906	Lehigh & Hudson River.....	172,749	4,084	195,649	10,224	1,555	67,681	7,138	110,912	116,012	5,000	7,136	87,736
1,084	Lehigh Valley.....	1,084,000	10,000	1,094,000	10,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
1,446	Lehigh Valley.....	1,446,000	14,460	1,460,460	14,460	1,446	14,460	1,446	14,460	14,460	1,446	14,460	1,446
397	Long Island.....	397,341	425,559	1,489,219	156,303	156,303	17,689	1,570,793	1,662	1,570,793	1,662	1,570,793	1,662
1,154	Los Angeles & Salt Lake.....	1,154,556	1,206,612	11,548,212	133,777	39,269	21,606	23,176	631,764	574,848	55,225	519,613	77,401
302	Louisiana & Arkansas.....	10,353	13,822	13,848	21,612	22,269	4,121	39,359	41,399	49,508	10,404	33,152	10,779
1,084	Louisiana, W. & Nav. Co.....	1,084,000	10,000	1,094,000	10,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
198	Louisville, Henderson & St. Louis.....	198,300	39,530	178,835	18,292	30,199	4,366	69,930	7,954	76,884	25,432	11,711	78,558
1,216	Maine Central.....	1,216,431	354,819	1,217,358	112,464	143,440	18,509	17,358,281	61,903	82,224	8,454	58,741	341,213
1,861	Michigan Central.....	1,861,741	1,853,932	4,350,707	544,893	644,481	68,009	1,735,511	3,100	3,100	188,000	1,020,235	198,191
1,647	Minneapolis & St. Paul.....	1,647,721	1,607,975	6,374,535	88,545	16,412	32,568	1,647,721	80,781	1,647,721	80,781	1,647,721	80,781
4,227	Minneapolis, St. Paul & S. Marie.....	4,227,666	575,311	3,302,933	361,636	171,716	12,528	1,064,742	18,478	66,697	1,331,819	3,371,199	37,550
365	Missouri & North Arkansas.....	365,439	31,757	103,043	21,631	19,471	3,806	39,517	359	359	4,803	8,516	7,455
3,865	Missouri, Kansas & Texas System.....	3,865,165	836,107	3,456,984	497,069	568,482	67,362	1,213,917	25,297	95,731	2,465,444	88,540	14,751
1,382	Missouri, Kansas & Texas System.....	1,382,165	124,518	1,030,939	227,089	37,522	39,213	39,213	2,716	3,743	804,723	32,048	32,048
1,108	Monongahela.....	1,108,462	13,881	187,784	35,480	13,886	760	53,933	7,603	8,454	108,551	79,233	5,391
6	Monongahela Connecting.....	112,270	584,156	55,188	79,430	26,172	334	60,729	3,901	11,731	12,228	15,890	1,894
401	Morgan's La. & Tex. R. & S. Co.....	112,270	584,156	55,188	79,430	26,172	334	60,729	3,901	11,731	12,228	15,890	1,894
1,236	Nashville, Chattanooga & St. Louis.....	1,236,804	258,023	1,410,297	115,760	90,668	10,168	141,613	2,337	2,337	30,211	24,946	46,592
2,885	New Orleans Great Northern.....	2,885,790	74,413	14,893	26,528	2,927	47,762	1,459	2,927	2,927	33,000	101,033	213,946
191	New Orleans, Texas & Mexico.....	191,783	21,922	104,680	10,860	17,273	3,961	29,542	5,582	5,582	67,330	37,350	33,938
1,570	New York, Chicago & St. Louis.....	1,570,367	133,768	1,485,673	133,768	17,273	3,961	29,542	5,582	5,582	67,330	37,350	33,938
1,957	New York, New Haven & Hartford.....	1,957,626	2,808,160	7,404,054	769,177	1,126,727	8,207	9,830,747	106,777	20,578	1,074,584	33,414	33,414
1,112	New York, Philadelphia & Norfolk.....	1,112,420	67,254	534,287	43,998	83,728	4,924	194,807	6,893	7,168	341,530	192,064	193,340
135	New York, Susquehanna & Western.....	135,242,091	49,662	330,008	23,104	31,552	2,749	132,652	6,015	21,955	151,053	14,053	24,015
2,085	New York & Western.....	2,085,852	522,588	5,953,349	528,136	1,060,293	73,663	1,833,391	10,252	10,265	3,588,595	2,004,774	1,751,868
6,098	Northfolk Southern.....	6,098,725	197,945	8,904,075	1,267,963	67,762	11,853	36,528	112,924	129,711	4,283,358	2,958,925	1,316,360
6,507	Northwestern Pacific.....	6,507,197	221,397	458,409	51,867	84,516	6,732	145,950	1,009	9,333	760,335	398,939	37,633
1,750	Panhandle & Santa Fe.....	1,750,469,474	88,071	581,549	121,750	95,446	4,076	71,554	.....	11,782	386,235	248,934	157,892
674	Pennsylvania Company.....	674,578,426	1,203,644	7,718,600	863,339	1,258,413	79,013	2,892,120	48,237	161,074	5,999,661	2,418,939	366,436
4,256	Pennsylvania Railroad.....	4,256,156,660	4,333,735	23,197,160	2,571,677	4,494,389	210,549	8,819,105	337,901	538,220	16,888,737	5,901,422	82,276
2,330	Pere Marquette.....	2,330,738	31,584	1,915,584	253,630	208,136	38,579	735,255	5,495	51,304	1,291,454	624,130	55,960
717	Philadelphia, Baltimore & Washington.....	717,198,541	1,047,083	2,809,630	299,970	526,734	27,711	1,656,563	237	61,305	2,068,938	740,670	74,915
224	Pittsburgh & Lake Erie.....	224,195,451	185,665	2,300,514	233,995	374,905	17,440	622,191	4,647	38,068	1,310,348	690,166	43,571
2,978	Pittsburgh, Cincinnati, Chic. & St. L.....	2,978,450,980	1,177,287	6,369,058	668,924	1,261,174	98,574	2,380,378	44,815	139,708	4,593,433	1,776,635	238,219
468	Railroad of Maryland.....	468,163,668	164,468	374,807	47,697	56,477	10,976	131,380	1,158	8,976	276,666	99,235	12,864
258	St. Joseph & Grand Island.....	258,155,456	24,271	195,944	87,538	28,225	3,255	75,695	3,168	5,555	203,436	7,492	56,010
548	St. Louis, Brownsville & Mexico.....	548,154,860	118,340	296,070	50,201	36,602	10,195	85,167	.....	11,011	189,058	107,012	8,800
190	St. Louis, Merchant's Bridge Terminal.....	190,61,304	23,926	14,403	3,824	12,830	3,058	13,329	.....	13,697	18,669	70,266	7,516
726	San Antonio & Aransas Pass.....	726,191,158	78,743	300,344	38,251	58,505	7,467	139,470	.....	13,330	256,347	43,997	28,473
3,461	Seaboard.....	3,461,156,748	809,463	2,265,152	274,112	335,329	75,959	2,444,578	14,596	188,259	4,766,876	2,626,501	1,638,651
6,982	Southern.....	6,982,644,805	1,529,770	7,143,681	588,031	1,396,393	167,157	8,166,258	50,109	188,259	4,766,876	2,626,501	1,638,651
7,555	Southern.....	7,555,939,981	234,728	12,051,617	79,076	7,837	4,833	34,201	178,010	32,789	56,997	31,392	1,921
294	Spokane, Portland & Seattle.....	294,100,064	163,237	651,617	1,090,797	1,466,397	8,437	184,923	4,934	13,036	6,301,523	5,350,064	588,460
36	Tennessee Central.....	36,351,333	144,278	26,949	24,663	4,867	53,623	.....	9,718	119,351	24,926	4,900	30,126
36	Terminal R.R. As'n. of St. Louis.....	36,184,443	434,783	55,769	18,644	1,120	12,433	1,826	16,654	266,446	38,336	34,666	253,670
1,468	Texas & New Orleans.....	1,468,109,260	504,338	3,817,871	31,897	85,714	7,935	146,762	11,435	29,300	280,848	74,413	28,884
1,435	Texas & New Orleans.....	1,435,636,981	7,62,652	1,17,425	1,17,425	1,17,425	7,138	268,024	1,849	10,291	1,525,611	21,940	285,744
248	Toledo, Peoria & Western.....	248,65,069	39,308	122,163	23,080	28,778	2,404	47,478	.....	9,180	102,991	4,186	10,025
455	Trinity & Brazos Valley.....	455,521,111	38,290	557,628	95,281	91,004	18,164	222,436	.....	6,208	43,712	151,915	20,000
369	Trinity & Brazos Valley.....	369,58,991	11,073	74,430	19,286	25,572	2,503	34,935	.....	7,300	89,616	15,186	11,305
35	Union R. of Pennsylvania.....	35,142,975	35,346	55,692	5,388	5,388	.....	237,358	.....	5,635	466,723	130,740	11,335
171	Victorville, Shreveport & Pacific.....	171,87,638	43,383	150,493	69,655	51,711	51,263	1,663	5,823	109,207	41,286	10,025	30,715
2,519	Virginian.....	2,519,814,541	43,284	906,493	131,514	6,064	221,851	20,292	14,385	462,183	444,140	39,000	405,430
359	West Virginia & Seaboard.....	359,243,793	674,104	3,381,519	369,036	410,207	85,727	1,419,159	20,519	75,797	2,406,163	1,073,356	967,957
775	Western Maryland.....	775,936,615	92,392	1,001,537	123,907	200,355	21,564	371,276	13,271	29,975	809,500	292,087	366,579
133	Western Maryland.....	133,64,593	42,888	119,907	13,420	25,200	6,443	41,700	2,163	4,700	62,024	93,949	29,958
1,382	Western Maryland.....	1,382,1,096,880	122,819	159,598	8,193	491,688	1,378	491,688	2,376	3,036	1,097,578	44,400	351,058
1,382	Western Maryland.....	1,382,1,096,880	122,819	159,598	8,193	491,688	1,378	491,688	2,376	3,036	1,097,578	44,400	351,058

Average mileage operated per period.	Name of road.	Operating revenues			Operating expenses			Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) last year.
		Freight.	Passenger.	Total. (inc. mil.)	Traffic.	Trans- portation.	Miscel- laneous.				
312	Alabama Great Southern.....	\$2,306,229	\$4,290,863	\$101,624	\$988,264	\$16,704	\$65,939	\$253,282	\$31,071	\$99,298	\$508,000
413	Alabama & Vicksburg.....	649,947	1,065,778	126,118	1,261,186	38,316	37,066	1,000,000	1,000,000	508,000	71
378	Arizona Eastern.....	1,828,702	3,318,549	1,386,668	1,931,881	161,248	85,215	1,225,566	121,940	1,123,626	451,062
8	Atchafalaya & Santa Fe.....	406,341	792,747	138,668	666,079	15,021	30,852	581,713	43,620	167,203	41,062
670	Atlanta, Birmingham & Atlantic.....	1,467,390	2,272,919	305,143	94,945	\$83,670	228	1,584,440	111,394	228,432	312,388
4,480	Atlantic Coast Line.....	17,470,519	55,640,113	2,436,042	3,531,908	395,150	184,356	46,733,255	12,559,532	32,188	191,911
4,545	Baltimore & Ohio.....	43,034,335	8,972,185	6,055,182	1,900,294	1,567	381,077	992,838	12,659	205,911	191,911
87	Baltimore & Annapolis.....	330,633	132,297	47,386	7,767	288,351	16,072	432,939	14,432	16,307	16,307
632	Banyar & Associates.....	1,910,625	2,395,247	311,233	373,905	24,152	70,323	1,710,975	90,000	71,143	71,143
1,887,501	Belt Ry. Co. of Chicago.....	1,887,501	1,887,501	312,213	270,539	8,448	660,897	1,887,501	312,213	171,143	171,143
205	Bessemer & Lake Erie.....	4,588,674	1,000,185	1,887,501	8,448	1,600,897	70,323	3,886,372	171,143	470,540	470,540
44	Birmingham Southern.....	1,121,219	1,582,638	178,781	184,335	230,005	417	2,079,4	893,345	70,525	70,525
2,306	Boston & Maine.....	17,134,388	7,676,032	2,804,619	2,992,521	41,918	204,610	6,915,512	25,703	9,104	9,104
373	Buffalo & Susquehanna R. R. Corporation.....	779,395	36,367	830,311	131,316	244,974	9,130	5,950,348	1,331,189	47,146	47,146
586	Buffalo, Rochester & Pittsburgh.....	9,534,572	1,937,616	2,018,2	308,335	98,643	41,378	7,792,3	1,235,276	80,400	83,455
18	Carolina, Cincinnati & Ohio.....	1,921,140	7,505	103,568	10,484	6,33	5,526	21,913	3,600	48,825	1,370
1,919	Central of Georgia.....	4,679,278	1,701,473	7,176,773	1,061,170	1,283,394	24,254	5,433,502	1,283,394	42,000	42,000
276	Central New England.....	2,411,795	7,188,235	470,411	2,553,359	6,548	4,569	2,237,7	1,528,186	39,000	39,000
1,732	Charleston & Western Carolina.....	20,816,690	3,404,983	24,032,12	2,709,178	5,284,424	174,319	18,460,839	871,912	6,997,137	402,443
1,035	Chicago & Alton.....	6,963,908	2,075,153	9,030,862	989,790	1,910,891	34,746	8,814,435	2,069,762	33,116	445,086
1,132	Chicago & Eastern Illinois.....	7,663,944	1,573,141	10,047,319	1,119,422	2,466,941	165,530	7,859,435	37,559,435	178,265	31,183
810	Chicago & North Western.....	33,663,990	10,808,541	44,803,805	5,778,027	8,273,378	67,684	20,944,203	1,531,351	165,183	165,183
246	Chicago Junction.....	1,000,675	5,833,979	2,412,510	3,426,466	96,319	17,859	4,866,370	6,811,013	516,100	610,628
1,917	Chicago, Cincinnati, Chic. & St. Louis.....	37,664,172	9,511,435	52,923,357	2,490,359	881,790	22,006,469	37,980,8	10,618,83	10,834,639	1,371,839
255	Chicago, Peoria & St. Paul.....	37,664,172	1,303,374	10,337,40	1,238,28	214,254	35,782	443,082	852,147	191,593	22,638
276	Chicago, Rock Island & Pacific.....	1,338,085	374,739	1,838,402	2,553,138	264,843	61,453	1,672,997	66,439	70,803,03	110,793
4751	Cripple Creek & Colorado Springs.....	4,751,212	9,586,235	40,340,759	5,827,305	7,837,305	19,176	1,722,856	3,683,63	5,514,191	5,514,191
1,538	Crescent & Northern Pacific.....	4,968,430	588,275	1,349,218	713,991	1,076,091	90,334	2,122,580	826,257	617,838	170,618
322	Dalhart & Western.....	9,171,665	1,349,218	12,679	218,729	42,413	5,791	1,040,905	24,762	30,914	1,315
2,578	Danville & Hudson.....	1,991,439	1,293,274	13,983,804	1,310,670	2,989,025	461,514	10,910,065	24,762	30,914	1,315
2578	Denver & Rio Grande.....	10,683,811	1,940,620	13,490,305	1,333,367	2,588,295	241,887	4,354,027	176,240	405,997	1,738,38
235	Denver & Salt Lake.....	3,575,771	1,317,000	9,577,538	1,868,84	1,700,878	12,768	2,462,492	30,914	30,914	1,315
80	Detroit & St. Joseph.....	13,570	9,935,821	47,102	57,218	10,375	295,611	.....	150	150	47,534
441	Detroit, Toledo & St. Louis.....	68,129	1,268,393	138,206	186,395	25,964	741,410	.....	46,456	1,38,461	34,548
269	Duluth and Iron Range.....	14,655	601,296	50,429	87,848	70,3	196,899	.....	24,465	360,374	190,738
414	Duluth, Missabe & Northern.....	5,711,127	124,322	2,021,672	526,618	444,986	8,035	735,095	9,623	18,080	321,227
1,038	Elgin, Joliet & Eastern.....	1,268,451	1,268,451	654,831	834,313	125,473	47,800	2,078,34	43,037	761,176	1,302,756
101	Elgin, Joliet & Eastern.....	7,639,440	664,492	2,108,843	47,800	1,908,833	43,037	1,908,833	43,037	1,908,833	1,908,833
765	Florida East Coast.....	2,452,566	1,690,962	4,863,286	394,537	479,892	56,330	3,079,236	18,080	31,200	321,227
454	Fort Worth & Denver City.....	5,023,044	70,663	5,023,044	1,000,755	1,259,043	203,900	3,769,239	73,001	100,000	93,000
1,164	Galveston, Harrisburg & San Antonio.....	7,712,911	2,250,510	1,860,314	1,746,8	6,759	2,183	181,575	138,582	340,884	202,753
402	Georgia, Southern & Florida.....	386,840	386,840	189,820	308,840	451,50	505,844	1,111,800	248,514	70,157	177,583
575	Grand Rapids & Indiana.....	2,125,544	687,676	4,027,015	390,045	594,180	66,110	1,459,358	12,965	144,857	106,725
800	Grand Northern.....	29,933,369	7,066,471	40,002,467	6,007,995	10,142	31,334	28,678,534	11,835,38	2,577,014	96,500
402	Gulf & Ship Island.....	143,568	8,027,027	1,539,935	1,185,301	2,097,519	340,533	5,331,878	2,095,104	364,395	615,997
1,937	Gulf, Mobile & Northern.....	813,504	1,433,504	1,433,504	1,433,504	1,433,504	1,433,504	1,433,504	1,433,504	1,433,504	1,433,504
350	Houston, East & West Texas.....	6,657,616	438,613	4,716,200	422,713	1,059,444	53,859	1,653,582	1,188,793	1,188,793	493,007
191	Hocking Valley.....	647,564	7,630	884,723	101,936	1,040,089	13,519	1,635,589	1,133,292	1,133,292	196,584
918	Houston & Texas Central.....	2,538,703	7,548,430	4,576,713	5,947,613	656,388	13,177,221	23,078	990,342	2,036,117	5,304,837
309	Indiana Harbor Belt.....	5,583,571	7,624,861	2,633,306	285,969	335,301	17,345	1,905,713	1,905,713	1,905,713	1,905,713
1,159	International & Great Northern.....	1,235,822	5,644,413	241,280	886,135	140,622	2,160,917	2,160,917	2,160,917	2,160,917	2,160,917
177	Kanawha & Michigan.....	1,399,573	180,691	1,639,803	228,634	16,361	493,216	1,639,803	228,634	16,361	180
765	Kansas City, Mexico & Orient of Texas.....	5,917,202	7,951,147	5,917,202	6,007,817	834,345	151,47	1,573,963	1,573,963	1,573,963	1,573,963
900	Kansas City & Western.....	3,304,104	316,094	4,016,579	426,577	426,577	80,217	3,590,002	2,795,664	1,033,577	309

Public Service Commissions Pledge Co-operation

Letters received from public service commissions in all parts of the country indicate that a most encouraging response is being made to the recent plea of the Railroads' War Board, urging, on the part of public authorities, co-operation with the railroads in a suspension during the period of the war "of all efforts not designed to help directly in winning the war." Many public service commissions have also pledged their support to the railroads' campaign "to make one car do the work of two" by urging shippers to load cars to capacity and reduce delays in loading and unloading.

The states whose public service commissioners have replied to the appeal are Louisiana, Texas, Kansas, Indiana, Tennessee, New Jersey, Virginia, Massachusetts and Michigan.

The Railroad Commission of Texas, through its chairman, Allison Mayfield, said: "We thoroughly agree with all you have to say and pledge such co-operation as lies within our power."

From Indiana, E. I. Lewis, chairman of the public service commission, sent this message: "We already are frowning on requirements of railroads which are not absolutely necessary for national service or public safety. We hope that you will call on us at any time when we may be of service in the work that you have in hand. Permit me to say at this time that the railroad men in Indiana have been co-operating in the most exceptional and exemplary way in trying to solve the severe coal problem."

The Railroad Commission of Louisiana has sent circulars out urging shippers to co-operate in every way possible.

The Tennessee Railroad Commission is also co-operating with the railroads to eliminate unnecessary passenger trains.

Lo, the Poor Farmer!

A merchant in a Missouri town showed a farmer a buggy priced at \$90, and the farmer kicked because twenty years ago his father bought one just like it for \$60.

Then the merchant looked up the record of sale and found that the father had turned in 300 bushels of corn for that buggy, and he told the farmer's son to deliver to him 300 bushels of corn and he would give him:

1—\$90 Buggy.	1—\$ 3 Box of cigars.
1— 75 Wagon.	10 Worth of sugar.
1— 20 Suit of clothes.	10 Worth of tea.
1— 20 Dress.	100 Worth of lubricating oil.
1— 5 Baby dress.	
1— 5 Crib.	

The total figures \$365, as the value of 300 bushels of corn, and it is needless to say that the high cost of living disappeared from the farmer's mind and he bought the buggy.—St. Louis Lumberman.

Adamson Says His Law Not Being Complied With

Congressman Adamson, chairman of the House Committee on Interstate and Foreign Commerce, has issued a statement charging the railroads with failure to comply with the spirit of the Adamson "eight-hour" law. He said in part:

"The railroads by the connivance of the trainmen seem to be proceeding in the same old way. They are running heavy, long trains, letting them lie over at stations, for other trains to pass, when they break down, averaging 10 miles an hour, including stops and paying the men for time over eight hours a day, entirely ignoring the letter and spirit of the law.

"If the railroads would properly enforce the law, they would run an average of 12½ miles instead of 10 miles an hour, thereby without additional cost covering a division of 80 per cent of the cases in eight hours where 10 are now required. In the 20 per cent of cases where a division is more than 100 miles, overtime would be required as now, but no more overtime than now, and there would be no more cost for overtime.

"I think if the railroad and trainmen rely on the hope that any report of the Goethals commission made by observing present practices will ever be credited by the commission or by Congress, they will be woefully disappointed. The Goethals commission is required to observe the operation of the law for not less than six months, nor more than nine months. But it is impossible for such operation to begin until the railroads begin to enforce the law.

"If the railroad officials do not make reforms there will probably be other legislation. It may be that either the length and

speed of trains will be directly regulated or authority will be conferred on the commission to control both; and the language of the law may be so plain that nobody can cavil or dispute it, in court or out, that men who operate trains involving the safety of life, limb and property shall not work over eight hours a day, except in cases of real emergency, which emergency does not grow out of collusion or regular practice, but arrives in spite of efforts to enforce the eight-hour day."

Railway Signal Association

Secretary C. C. Rosenberg announces that the board of direction has decided that the annual meeting of the association, to be held at the Hotel Traymore, Atlantic City, N. J., shall be confined to a two days' business meeting, Tuesday and Wednesday, September 18 and 19.

The business to be transacted is to deal with the conclusions of the several committees, on the subjects which have been presented by them, and which have been discussed at the last two meetings—Chicago in March and New York in June. The session each day will be from 9:30 a. m. to 6 p. m., with an intermission for luncheon.

National Association of Railway Commissioners

The twenty-ninth annual convention of the National Association of Railway Commissioners will meet in the hearing room of the Interstate Commerce Commission in the new building at the corner of Pennsylvania avenue and Eighteenth street N. W., Washington, D. C., on October 16, 1917, at 10 a. m., and will continue in session for four or five days.

Reports will be submitted by the following standing committees:

- Executive Committee, Charles E. Elmquist of Minnesota, chairman.
- Express and other contract carriers by rail, J. Prince Webster, Rate Expert, Georgia, chairman.
- Safety of railroad operation, C. C. McChord, Interstate Commerce Commission.
- Railroad service accommodations and claims, C. B. Garnett, Virginia.
- Grade Crossings and trespassing on railroads, James B. Walker, Secretary, New York, First District.
- Railroad rates, A. E. Helm, Commerce Counsel, Kansas.
- Statistics and accounts of railroad companies, Arthur A. Lewis, Washington.
- Car Service and demurrage, Frank H. Funk, Illinois.
- Public utility rates, Thomas W. D. Worthen, New Hampshire.
- Service of public utility companies, M. H. Aylesworth, Colorado.
- Safety of operation of public utility companies, Frank R. Devlin, California.
- Statistics and accounts of public utility companies, James O. Carr, New York, Second District.
- Valuation, Charles E. Elmquist, Minnesota.
- Capitalization and intercorporate relations, Alonzo R. Weed, Massachusetts Board of Gas and Electric Light Commissioners.
- State and federal legislation, Joseph L. Bristow, Kansas.
- Publication of commissions' decisions, Ledyard P. Hale, Counsel, New York, Second District.
- Special committee—Public ownership and operation, E. O. Edgerton, California.

On Wednesday evening, October 17, the members of the convention will attend a banquet at the New Willard Hotel.

In the call for the convention the association's officers emphasize the importance of the meeting as follows: "The time calls imperatively for united, patriotic action by all men charged with public responsibility. At this convention the present vital problems of public utility regulation, including the public utilities' function in serving the nation's need, the requests of railroads and other public utilities for increases in rates and for authority to diminish or discontinue service, and the requests of the public for reasonable rates and more adequate service, will be fully discussed with a view to uniform, constructive action by the various state and federal regulatory commissions."

The Traveling Engineers' Association

The executive committee of the Traveling Engineers' Association has decided that, owing to war conditions, the association will not hold its annual convention this year. The executive committee, however, will meet and will issue an annual report containing all information as to what has happened during the year.

The committee reports and papers will be printed and new subjects will be sent out and committees appointed for next year's business.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meetings of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

AMERICAN ASSOCIATION OF DINING CAR SUPERINTENDENTS.—H. C. Boardman, D. L. & W., Hoboken, N. J. Next convention to have been held October 22-24, 1917, San Francisco, Cal., indefinitely postponed.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 43 Liberty St., New York. Next meeting, October 16-17, St. Louis.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 16-18, 1917, St. Paul, Minn.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—W. L. Connelly, Supt. of Telegraph, Indiana Harbor Belt, Gibson, Ind. Next annual meeting to have been held September 18, 1917, Washington, D. C., indefinitely postponed.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—W. R. McMunn, New York Central, Albany, N. Y. Next convention, September, 1917, St. Louis.

CINCINNATI RAILWAY CLUB.—H. Boutet, Chief Interchange Inspector, Cinti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 568 Union Avenue Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, 2d Wednesday preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

INVESTMENT BANKERS' ASSOCIATION OF AMERICA.—Frederick R. Fenton, 11 W. Monroe St., Chicago. Annual convention, October 1-3, 1917, Baltimore, Md.

MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 16-18, 1917, Cleveland, Ohio.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—F. Dane, B. & M., Reading, Mass. Next annual meeting, September 11, Chicago.

NATIONAL ASSOCIATION OF RAILWAY COMMISSIONERS.—Jas. B. Walker, 120 Broadway, New York City. Next annual convention, October 16, 1917, Washington, D. C.

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

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Geo. A. J. Hochgrebe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PACIFIC RAILWAY CLUB.—W. S. Wollner, Assistant to Chief Engineer, Northwestern Pacific R. R., San Francisco, Cal.

PEORIA ASSOCIATION OF RAILROAD OFFICIALS.—J. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

RAILWAY CLUB OF PITTSBURGH.—H. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial Annex Hotel, Pittsburgh.

RAILWAY FIRE PROTECTION ASSOCIATION.—C. R. Edwards, office of the president's assistant, Seaboard Air Line, Norfolk, Va. Next meeting, October 2-4, 1917, St. Louis, Mo.

RAILWAY REAL ESTATE ASSOCIATION.—R. H. Morrison, Assistant Engineer, C. & O., Richmond, Va. Next convention, October, 1917, Duluth, Minn.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next annual convention, September, 1917, Atlantic City, N. J.

RICHMOND RAILROAD CLUB.—P. O. Richmond, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W., Washington, D. C. Next annual convention, September 18-21, 1917, Hotel Duffield, N. Y., Chicago.

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

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September and November, 10 m., Piedmont Hotel, Atlanta.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf Astoria Hotel, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Gen'l Ag't, Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings bi-monthly, Pittsburgh.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio. Next convention, September, 1917, Chicago.

UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

WESTERN CARBON & LUMBER CO.—L. Roy, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

Traffic News

The Public Utilities Commission of Maine has suspended until September 1 proposed increases in passenger fares filed by the Maine Central.

All of the principal railroads in Missouri have filed application with the State Public Service Commission for authority to increase freight rates on coal and coke 15 cents a ton.

Reports from Frankfort, Ky., August 3, tell of further suits by coal companies in the Federal courts against the Chesapeake & Ohio, alleging damages by reason of the railroad's failure to furnish cars for coal. In these suits the aggregate amount of damages claimed is about \$800,000.

The Kansas Public Utilities Commission has authorized the Missouri Pacific to discontinue 14 passenger trains in that state principally on branch lines, substituting therefore mixed train service. This action is in accordance with the general plan outlined by the Council of National Defense.

William P. Kappes, receiver of the Evansville & Indianapolis, announces that on the recommendation of the Council of National Defense he has discontinued the operation of two daily passenger trains making a reduction of 160 passenger train miles a day, or approximately 5,000 miles a month.

Representatives of the various railroads in Nebraska met in Omaha and organized the Omaha branch of the Railroad War Board Department of Information. The board will conduct a campaign to induce western shippers to load all cars to maximum capacity, to load and unload cars quickly, and to conserve freight cars in every possible manner.

The Public Service Commission of Massachusetts has ordered a general reduction in the rates for the transportation of milk by passenger train or special train, the new rates being based, it is said, on the standard which has been established by the Interstate Commerce Commission for the interstate transportation of milk to Boston. Rates for carloads are made 12½ per cent less than the standard tariff and shipments by freight train 25 per cent less.

The railway war board has announced a curtailment of passenger service that will doubtless surprise the traveling public inasmuch as probably not one passenger out of ten has been at all inconvenienced. The elimination of passenger service will make available for other purposes over one million tons of coal, which will provide three billion ton miles. It is remarkable that this change has been brought about without noticeable criticism. —American Express Co.'s Bulletin.

Domestic Travel by rail and inland waterways for both commercial and tourist purposes is assuming normal summer proportions. The feeling of uncertainty on account of war conditions seems to have disappeared. Tourist traffic to the National Parks and other pleasure grounds both East and West is reported off about 25 per cent as compared with the summer of 1916. Alaska tourist traffic is off about 50 per cent. Commercial travel shows an increase, and the large movement of United States troops has helped to place the total volume of railway passenger traffic well beyond the figures for the corresponding summer period of 1916.—American Express Co.'s Bulletin.

A meeting of shippers and railroad officers was held at the assembly room of the Atlanta (Ga.) Chamber of Commerce on August 3, to consider ways and means for the most economical use and utilization of the freight car supply. Hon. C. Murphy Candler, chairman of the Railroad Commission of Georgia, presided, and the following signed the call for the meeting: Harry T. Moore, secretary of the Atlanta Freight Bureau, and chairman of the Atlanta regional committee of the National Industrial Traffic League; Ivan E. Allen, president of the Atlanta Chamber of Commerce; H. G. Hastings, president of the Georgia Chamber of Commerce; and E. G. Hitt, general secretary of the Atlanta district sub-committee of the Commission on Car Service.

Appeal by the Illinois Central

Under the caption "Many Are Doing Their Bit, Are You?" the Illinois Central has issued a poster, printed in red and blue on a white background, bearing the following:

HELP YOUR COUNTRY.

Eliminate car-destroying trade units.
Load cars to full capacity.
Persuade your men to co-operate.

When practicable, load two carloads in one car.
Insist on prompt loading and unloading.
No cars to be used as warehouses.

Take no orders less than full carload.
Have billing furnished early.
Eliminate reconsigning; bill to unloading point.

Where absolutely necessary to reconsign, do it while car is in motion.
A car-day lost is economic waste.
Remember, efficient transportation service is vital to our army and navy.

Twenty Thousand Tons of Tobacco

In the present stress it may come about that water transportation is profitable, on occasion, even if the cost is greater than it would be, normally, by railroad. According to a Louisville (Ky.) paper James M. Buckner, of that city, who sold 40,000,000 pounds of tobacco to the French government, was faced with a disastrous loss, being unable to get cars for shipping the tobacco to the sailing port, New Orleans; but he finally secured several river packets and delivered the tobacco at the Gulf. But then he was unable to hire or charter a vessel to carry it to France. He asked the French Commissioner what his government would pay for transporting the tobacco, which is sold in that country, at huge profits, by the government. The commissioner agreed to pay \$5.10 per 100 lb. Mr. Buckner then procured \$300,000 with which to buy three sailing vessels. One of these vessels has departed for France with tobacco, and another will leave shortly. The third will contain a cargo of cotton.

Mr. Buckner manifested his disappointment at not getting cars by taking photographs while the hogsheds of tobacco were being loaded on packets and mailing a copy to each of a number of railroad presidents. He wrote underneath, "James M. Buckner shipping tobacco by packets because of inability to get freight cars."

N. Y. Central Proposes Increased Fares

The New York Central has filed with the Public Service Commission of New York state new passenger tariffs, making a large number of advances in single trip fares. The commission for the First district (New York City) has suspended the rates for 20 days—from September 1, the date announced by the railroad, to September 20—and has ordered a hearing August 15; while the commission for the Second district announces that the increases cannot be approved so far as they relate to rates west of Albany, because the franchise of the company, granted many years ago, limits local rates on that part of the road to two cents a mile. The new tariffs propose to make these rates 2½ cents a mile, and also propose to advance thousand-mile tickets, which are sold for two cents a mile, to 2¼ cents. Examples of the proposed changes are given below (rates from New York):

	Old rate	Proposed rate
To Albany	\$3.10	\$3.58
To Utica	5.00	5.93
To Syracuse	6.06	7.25
To Rochester	7.68	9.28
To Buffalo	9.25	10.98
To Yonkers .....	.30	.38
To Peekskill .....	.90	1.03
To Poughkeepsie	1.58	1.83
To Mt. Vernon .....	.30	.35
To White Plains .....	.50	.58
To Mt. Kisco .....	.88	.93
To Brewster	1.28	1.30

The Public Service Commission for the Second district has before it applications from most of the electric roads in the state asking for authority to make general increases in fares; and it is understood that in the case of the electric roads, as with the New York Central, broad investigation will be made into the extent of the powers of the commission to authorize deviations from the original franchise requirements.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

Uncompressed Cotton to Memphis and St. Louis

City of Memphis et al. v. Chicago, Rock Island & Pacific et al. Opinion by Commissioner Daniels:

Upon rehearing, differentials proposed by defendants in rates on uncompressed cotton from points in Arkansas and Missouri on lines of the St. Louis, Iron Mountain & Southern Railway, St. Louis Southwestern Railway, and St. Louis & San Francisco Railroad to Memphis and St. Louis, respectively, are, with certain exceptions, approved. (45 I. C. C., 487.)

Rates to Mitchell, S. D.

Commercial Club of Mitchell, S. D., et al. v. Ahnapee & Western et al. Opinion by Commissioner Daniels:

Class rates to and from Mitchell, S. D., from and to points east or south of Sioux City, Iowa, and Sioux Falls, S. D., are found unreasonable and prejudicial. Reasonable maximum rates are prescribed for the future, including proportional rates from the upper Mississippi River crossings.

Commodity rates to Mitchell constructed in relation to the corresponding commodity rates to Sioux Falls are recommended.

Fourth section relief is denied. (46 I. C. C., 1.)

COURT NEWS

Proof of Defective Car Door

In a cattle shipper's action for injuries from a door of the car hired, which fell upon him while he and others were attempting to open it, the Missouri Supreme Court holds that the burden was on the shipper to show that the defendant railroad's car door was defective, and that the injury resulted therefrom, the doctrine of *res ipsa loquitur* not being applicable.—*Deister v. Kansas City N. W. (Mo.)*, 195 S. W., 499. Decided May 29, 1917.

Application of Safety Appliance Act

The Circuit Court of Appeals, Sixth Circuit, holds that under the provision of the Safety Appliance Act, as to the use of air brakes, a number of bad-order cars, fastened together by chains, together with an engine, tender and caboose, constituted a train, even though it would be highly inconvenient to apply the train-brake provision to such cases, and might necessitate limiting the number of chained-up cars hauled to 15 per cent of the cars in the train, the train-brake provision being absolute and mandatory.—*Pennsylvania Co. v. United States*, 241 Fed., 824. Decided May 8, 1917.

Unused Transit Credit

A milling in transit rate is an entirety, and must be accepted and carried out in its entirety or not at all. The Nebraska Supreme Court holds that a shipper cannot maintain an action in the courts of that state for unused transit credit on shipments of grain made from various points in Nebraska, destined to points outside of Nebraska, and to one point in Nebraska, where parts of each car were forwarded indiscriminately to the points of destination, and where the rules and regulations of the tariff have not been complied with.—*Fremont Milling Co. v. Chicago & N. W. (Neb.)*, 163 N. W., 331. Decided May 19, 1917.

Switching Service

The Minnesota Supreme Court holds that where a Minnesota railroad corporation was required by its franchise to construct and operate a complete railroad system in the state, including switching yards and tracks, and where it acquired a switching road as a part of its system, and the switching company held the

legal title to the property as a mere convenience, the Railroad and Warehouse Commission, even in anticipation of an abandonment, might order the railroad to continue its operation.—*Minneapolis C. & C. Assn. v. Great Northern (Minn.)*, 163 N. W., 294. Decided June 15, 1917.

Anti-Pass Law and Deed to Right of Way

The Kentucky Court of Appeals holds that section 196 of the State Constitution, providing that passenger transportation shall be regulated to prevent unjust discrimination, and section 197, prohibiting free passes, render void as against public policy a railroad's agreement to give free transportation in return for right of way deeded it, especially as the Kentucky Anti-Pass Law of 1916, enacted pursuant to section 196, specifically prohibits transportation except for a money consideration. It is held that the Anti-Pass Law does not impair the obligation of an existing contract by a railroad to furnish passenger transportation in return for right of way deeded it, since the contract was made in view of section 196, and because the Anti-Pass Law is merely a police regulation within the legislature's constitutional powers. The court in its opinion reviewed the prior Anti-Pass Law decisions.—*Kentucky Traction & Terminal Company v. Murray (Ky.)*, 195 S. W., 1,119. Decided June 22, 1917.

Passengers Leaving Seats Before Train Stops

When the name of the next station is called two or three times by the conductor while the train is slackening for the station, the conductor does not request or invite a passenger to get up and go to the door while the train is moving; his language amounts merely to an emphatic announcement of the near approach to the station, and is a notice to passengers who desire to disembark there that the train is so approaching. A woman 40 years old, weighing 172 lb., having children with her, left her seat in a car when the conductor announced the approach to a station and stood by the door. The Arkansas Supreme Court holds that her acts should be viewed in the light of all the surrounding circumstances, and if under them her act was that of an imprudent person, she could not recover for an injury received by her in a fall, although it was the result of an unusual movement of the train.—*Lashlee v. Bush (Ark.)*, 195 S. W., 375. Decided May 21, 1917.

Change in Location of Station

A railroad is a quasi public highway, and, at least to the extent permitted by statute, the company may change the location of its tracks and stations. A legislative enactment being the supreme declaration of the public policy of the jurisdiction, the Kentucky Court of Appeals holds that when, under the provisions of a statute, the Railroad Commission has consented to and authorized a change of location of a station, it has but carried out the expressed public policy of the legislature upon the subject, which public policy is paramount to all inconvenience which may follow from an execution of the statutory provisions.—*Beatty v. L. & N. (Ky.)*, 195 S. W., 487. Decided June 5, 1917.

The Texas Court of Civil Appeals holds that a judgment restraining a railroad company from removing a station from a tract of land in violation of a covenant in the deed under which it obtained title to the land will not prevent the removal of the building in obedience to an order of the Railroad Commission when the public benefit requires such removal and the Railroad Commission orders it.—*San Antonio & A. P. v. Mosel (Tex.)*, 195 S. W., 621. Decided June 6, 1917.

Condemnation—Public Necessity

While the decisions of the courts of other jurisdictions are not uniform upon the subject, the California District Court of Appeal holds, in condemnation proceedings by a railroad, that the law in that state seems to be settled in favor of the view that, when the legislature has declared that railroad corporations shall have the right to condemn lands of private persons for their uses, the question whether there is a present public need for the construction and operation of the particular railroad seeking to exercise that right is no longer a judicial question to be litigated in the condemnation proceedings, except to the extent that a private person whose lands are sought to be taken

may put in issue the good faith of the railroad corporation in seeking to acquire his land for uses which are not public, but really to subserve some private interest or end.—*Castro Point Ry. & Terminal Co. v. Anglo-Pacific Development Co. (Cal.)*, 165 Pac., 544. Decided June 14, 1917.

Contributory Negligence of Passenger Crossing Tracks

A passenger attempted to cross the tracks near a station about midnight in front of an approaching freight train that he supposed was a passenger train, which would slacken speed at the station and give him time to cross. He tripped over a spike projecting about 3 inches from a tie and was run over by the train. The Texas Court of Civil Appeals holds that he was guilty of contributory negligence as a matter of law, and could not recover from the railroad.—*Schaff v. Combs (Tex.)*, 194 S. W., 1,159. Decided May 3, 1917.

Inspection of Cars

The Texas Court of Civil Appeals holds that the ultimate carrier of a car, although it made no inspection, was not liable for injuries to a consignee's servant, who, while unloading a carload of automobiles, loaded by the consignor in a foreign car, was injured by a loose casting falling from over the door on the inside of the car, the defect being one not discoverable from the outside of the car. The duty of such a carrier on receiving a car is held to extend only to a reasonable inspection of its condition with reference to its fitness for transportation.—*Kansas City, M. & O. v. Pysker (Tex.)*, 195 S. W., 981. Decided June 7, 1917.

Interstate Shipments

Bills of lading of shipments from Argenta, a point in Illinois, to New York, contained a notation to stop at Chicago for weight and inspection. The Illinois Supreme Court holds that, in the absence of evidence to sustain the consignee's contention that they were billed to New York merely to obtain a reduction in the freight rate, and were not intended to go beyond Chicago, they were interstate shipments.—*Shellabarger Elevator Co. v. Illinois Central (Ill.)*, 116 N. E., 170.

Merchandise was shipped from Oklahoma to Ft. Worth, Texas, transportation to be continued to some other point in Texas thereafter to be determined. There was no delivery at Ft. Worth, but delivery was made at the ultimate destination, Abilene. The goods, however, remained some time in Ft. Worth, and were shipped on a new bill of lading to Abilene. Action was brought by the shipper against the railroad company to recover the penalties provided by the Texas statute for refusal to deliver freight upon the payment or tender of the freight charges, as shown by the bill of lading, the railroad having refused delivery except on payment of an additional sum. The Texas Court of Civil Appeals holds that the shipments from Ft. Worth to Abilene was an interstate shipment, and as the state statute does not apply to such shipments, no recovery could be had.—*G. C. & S. F. v. Mathis (Tex.)*, 194 S. W., 1,134. Decided March 29, 1917.

Recovery by Initial Carrier from Connecting Carrier

In an action by the initial carrier against the terminal carrier for reimbursement for damage to an interstate shipment, the Iowa Supreme Court holds that the Carmack amendment, making initial carriers liable for loss to interstate shipments, and allowing recovery from the connecting carrier, makes the initial carrier's recovery dependent on a showing of injury to the shipment while in the connecting carrier's possession, and not upon the shippers' judgment against the initial carrier, although sum recovered by the shipper is conclusive as to the amount of damage, thus making the initial carrier the representative of all connecting carriers. In such an action the record of proceedings and judgment in the shipper's action are admissible, in view of the provision of the statute making the judgment proper evidence, and the record being necessary to show the scope of the adjudication. Although the statute does not require notice of the shipper's suit, to be given connecting carriers, the giving of such notice is proper practice. A reason for this is that

ordinarily, if a third person, having notice of an action against the defendant in which he is liable to the defendant, ignores such notice, he will be held to indemnify the defendant to the extent of the judgment rendered against the latter on the ground of estoppel, the purpose of the rule being to avoid a multiplicity of suits.—*St. Joseph & G. I. v. Des Moines Union* (Iowa), 162 N. W., 812. Decided May 16, 1917.

Construction of Grant of Right of Way

An instrument granted a right of way across certain lands, reserving the use of all of such lands except that portion actually used and occupied by the railroad. The company laid a single track, but cut grass and willows on the entire statutory width, used substantially all the ground within such width for erecting telegraph poles and storing materials, and for 32 years returned it for taxation and paid taxes thereon, while the grantor never availed himself of the right to use even those portions not occupied by the company. In a suit by the successor of the grantor against the railroad to establish title to the right of way and to enjoin the railroad from laying a track, in addition to its main track, on the strip of ground, the Circuit Court of Appeals, Eighth Circuit, held that the grant was of a right of way 100 ft. wide, the maximum width allowed by statute, and not merely a strip sufficient in width for a single track; the provision as to the right to use parts not occupied by the company constituting a reservation and not an exception. An "exception" is a withdrawal from the effect of a grant some part of the thing granted which is in existence and included under the terms of the grant; while a "reservation" is something arising out of the thing granted not then in existence, or some new thing created or reserved, issuing out of the thing granted and not a part of the thing itself. The reservation in the grant in this case would not extend beyond the grantor's own lifetime, in the absence of words of limitation and inheritance.—*Iowa Ry. & Light Co. v. C. M. & St. P.*, 241 Fed., 581.

Delegation of Power to Fix Rates

In 1905 the Missouri legislature passed an act establishing maximum intrastate rates, and in 1907 another establishing maximum passenger rates. In 1913 it passed the Public Service Commission Act, section 47, of which conferred upon the commission the power and duty of establishing reasonable maximum intrastate rates. The next year fourteen railroads applied for a revision upwards of freight and passenger rates, and following an investigation were granted certain modified measures of relief by the commission, to take effect January 1, 1916. A citizen brought the case into the County Circuit Court for review. That court reversed the finding of the commission, and the case was appealed to the state Supreme Court. The two questions involved are purely questions of law, namely, (a) Does section 47 of the Public Service Commission Act confer authority upon the commission to raise railroad rates above the maximum fixed by the legislature unless prohibited by the Constitution? (b) If the section has this effect, is it invalid because in violation of section 14, art. 12 of the State Constitution? The Supreme Court answered the first question in the affirmative. Section 14, art. 12, provides that the legislature shall from time to time pass laws establishing reasonable maximum rates of charges for the transportation of passengers and freight. The court mentioned seven states which have constitutions containing a provision wholly or substantially similar to that of Missouri, viz., Illinois, West Virginia, Nebraska, Washington, Alabama and Georgia; and cited cases from these states recognizing the authority of the legislatures to delegate to public service commissions the right to ascertain and determine reasonable rates. The court said that by section 47 of the Missouri Public Service Commission Act the legislature did not delegate to the commission the absolute power of fixing maximum rates, but only the power to ascertain and determine what rates are reasonable; and provided by other sections of the act for a judicial review of the fact of reasonableness, which is only *prima facie*, and while the commission may order the observance of these rates so found by it to be reasonable, under penalties for violation fixed by the legislature, such observance endures subject to a review by the courts. The judgment of the Circuit Court was reversed, with directions to affirm the order of the commission.—*State ex rel. Rhodes v. Public Service Commission* (Mo.). Decided April 9, 1917.

Equipment and Supplies

LOCOMOTIVES

THE MAINE CENTRAL is getting prices on 10 locomotives.

THE MORGANTOWN & KINGWOOD has ordered one Consolidation locomotive from the Baldwin Locomotive Works.

THE CENTRAL RAILWAY OF BRAZIL has ordered two Consolidation locomotives from the Baldwin Locomotive Works.

PANAMA CANAL LOCOMOTIVES SOLD.—Over 100 of the locomotives used in the construction of the Panama Canal have been disposed of by Governor Harding, of the Canal Zone, according to reports to Secretary of War Baker. Ten locomotives have been transferred to the Alaska engineering commission; two were sold to the Chile Exploration Company, and 95 were sold to the A. B. Shaw Company, which does a contracting business in New York.

FREIGHT CARS

THE DONNER STEEL COMPANY is inquiring for prices on 25 gondola cars.

THE RUSSIAN GOVERNMENT is about to place orders for an additional 10,000 1,200 pood (43,200 lb.) capacity four-wheel box cars. This is the second lot of 10,000 cars on this order on which 40,000 cars have been authorized. It is understood that Canadian car builders may receive this lot.

COPENHAGEN'S NEW UNDERGROUND RAILWAY.—As the result of the difficulty in getting the materials for rails, telegraphs and signals, it has been found impossible to complete a proposed new underground railway in Copenhagen.

EARNINGS OF SWISS RAILWAYS.—The earnings of the Swiss Federal railways for the past three years have been: In 1914, \$9,264,000; in 1915, \$10,808,000; in 1916, \$11,580,000. These profits, however, have been absorbed in amortization and betterments.

WAR TIME TRANSPORTATION.—One of the hardest things for a soldier to relish is railroad travel in war time. When a few men are moved at a time sleeping cars can be provided, but when an army must be moved in a hurry then day coaches and even freight cars come into play. During our late Mexican trouble there was considerable grumbling because our soldiers lacked Pullmans to travel in, and it is said that when German soldiers heard of this they quit fighting a whole day in order to give vent to their merriment. They are glad to travel in box cars with a little straw in the bottom. Our soldier boys "Somewhere in France" have perhaps had a taste of traveling in cars marked "Eight Horses or Forty Men," where they draw lots in order to see who lies down and who sleeps standing up. But the American boys are not the ones to kick at a hardship they know cannot be avoided.—*Wall Street Journal*.

RAILWAY DEVELOPMENT IN SOUTH RUSSIA.—The British vice-consul at Kherson reports, under date March 13, that the road bed of the railway between Merefa and Kherson is in complete order, and as soon as rails can be obtained they will be laid. This line will be very important for the export of grain and ore from Kherson, and it is expected that the line will be in full working order by the time foreign exports will again be possible. The government has officially confirmed the project for constructing a railway from Saratov to Alexandrovsk. The carrying out of this project will enable goods from the Saratov district to reach the port of Kherson via the River Dnieper, and vice versa, thus considerably increasing the volume of exports and imports at Kherson. Progress is being made with the construction of the railway between Kherson and Djanikoi, which will join Kherson with the Crimea-Kertch line. The government has sanctioned the building of a bridge over the Dnieper, which will be sufficiently high not to impede river traffic; the building of the bridge will be begun this year.

Supply Trade News

On August 1 the Kewanee plant of the National Tube Company, located at Kewanee, Ill., was sold to the Walworth Manufacturing Company, Boston, Mass., and on that date the National Tube Company retired from the fittings business.

The Acar Manufacturing Company, 30 Church street, New York, manufacturers of the Blue Signal Safety Device, announces the appointment of Leland T. Johnson as special representative, with headquarters at the Hotel Sherman, Chicago, and Burt E. Dana, New York salesman, with headquarters at 30 Church street, New York.

F. A. Molitor, consulting engineer, 35 Nassau street, New York, and major in the Engineer Officers' Reserve Corps, has recently been ordered from the Engineers' Training Camp to duty in Washington on the staff of S. M. Felton, the director-general of railways. This office is an adjunct of the chief of engineers, U. S. A., and has to do with the military railway and transportation problems in France.

The American Steel Export Company announces the appointment of Walter R. Morris as assistant traffic manager, with headquarters in the Woolworth building, New York City. Because of suspended service for an indefinite period of American-Hawaiian steamers via Panama Canal, Mr. Morris resigned his position as assistant traffic manager of the American-Hawaiian Steamship Company, to accept employment with the American Steel Export Company. Prior to his connection with the Panama Canal Line in 1910, then known as the Tehautepec Route, Mr. Morris was for a great many years associated with the Southern Pacific and Pacific Mail companies in their traffic departments at both San Francisco and New York.

Railway Equipment Forms Large Share of Year's Billion Dollar Steel Exports

Exports of iron and steel manufactures in the fiscal year ending June 30, 1917, were four times as great in value as in the fiscal year 1914. According to a compilation by the National City Bank of New York, in the fiscal year 1915 exports of iron and steel manufactures reached \$226,000,000, against \$251,000,000 in 1914. They were worth \$621,000,000 in 1916, and approximately \$1,120,000,000 in 1917, these being official figures for 11 months and an estimate for the closing month of the year.

Most of this increase in exportation in 1916 and 1917 went to Europe. The total value of iron and steel manufactures exported to Europe in the fiscal year 1915 was but \$92,000,000, in 1916, \$354,000,000 and in 1917 approximately \$700,000,000.

The following table shows the total exports of iron and steel and manufactures in the last four years, and also the exports of some of the important classes of railway material. The total for June, 1917, is estimated:

Total Iron and Steel and Manufactures

Year	Value
1917.....	\$1,117,831,000
1916.....	621,209,000
1915.....	225,861,000
1914.....	251,480,000

Locomotives

Year	Number	Value
1917.....	1,290	\$16,037,000
1916.....	799	12,665,000
1915.....	228	2,115,000
1914.....	383	3,692,000

Steel Rails

Year	Tons	Value
1917.....	611,000	\$26,632,000
1916.....	540,000	17,687,000
1915.....	159,000	4,537,000
1914.....	338,000	10,250,000

Railway Track Material

Year	Value
1917.....	\$8,164,000
1916.....	5,261,000
1915.....	2,407,000
1914.....	2,534,000

Railway cars are not separately divided in the National City Bank's compilation.

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—This company is preparing preliminary plans for the construction of a two-story brick head-house, 36 by 70 ft., and a frame freight-house, 36 by 200 ft., at Newton, Kan.

The company is also contemplating the construction of a freight transfer station at Kansas City, Kan. The plans at present provide for a frame structure, 30 by 1,000 ft., with about 400 ft. of platform. Part of the building will be two stories high, and will be used to house the office force.

CANADIAN PACIFIC.—This company will build a three-span reinforced concrete bridge at London street, Windsor, Ont. It will consist of three 35-ft. spans, with reinforced concrete abutments, piers and dock.

CHESAPEAKE & OHIO.—The Chesapeake & Ohio Northern was opened for traffic on July 30, from the main line of the Chesapeake & Ohio at Edgington, Ky., north to Waverly, Ohio, 30 miles. The work included the construction of a steel bridge, 3,450 ft. long over the Ohio river at Sciotoville; also a steel viaduct 1,080 ft. long over the Little Sciotoville river, two miles north of Sciotoville. A description of this line was published in the *Railway Age Gazette* March 3, 1916, page 397.

CHESAPEAKE & OHIO NORTHERN.—See Chesapeake & Ohio.

GULF & EAST TEXAS.—Incorporated in Texas with general offices at Hicks to build a railroad from Hicks to Wursbaugh, about 10 miles. The incorporators include E. R. Campbell and A. E. Ammerman, Houston; S. B. Hicks, J. T. Wursbaugh, M. F. Johnson and T. H. Scovill, Shreveport, La.

KANSAS CITY TERMINAL.—This company is drawing preliminary plans for the construction of two passenger stations at Kansas City, Kan. Details of the plans are not available at present, but the estimated cost of each station, with its approaches and platforms, will be approximately \$100,000. Construction is expected to be started this summer so that stations will be ready for service next spring.

MAHONING & SHENANGO (ELECTRIC).—This company, in conjunction with Lawrence county, Pa., is planning the construction of a bridge over Neshannock Creek at New Castle, Pa. The estimated cost of the structure is about \$66,000, but construction is not expected to start immediately.

MUSCLE SHOALS TRACTION.—A contract has been given by this company to the Central Construction Company, Indianapolis, Ind., to build a 64-mile interurban line. The projected route is from a connection with the Louisville & Nashville and the Southern Railway, at Florence, Ala., east via St. Florian, Bailey Springs, Killen, Center Star, Rogersville and Athens to Huntsville, where connection is to be again made with the Southern Railway and with the Nashville, Chattanooga & St. Louis. A branch line is also to be built north to Lexington, 12 miles. S. L. Whitten, president; T. W. Pratt, vice-president and treasurer; T. H. Allen, secretary and general manager, Florence, Ala.; E. M. Wilkins, chief engineer; and M. S. Bingham, consulting engineer.

PENNSYLVANIA-DETROIT.—A contract has been awarded by this company to Iliff Brothers, London, Ohio, for the construction of a bridge over the Huron river at a point two miles above Flat Rock, Mich. The bridge will be of reinforced concrete, and will have three 14-ft. spans.

PENNSYLVANIA LINES WEST.—A contract has been awarded by this company to P. T. Clifford & Son, Valparaiso, Ind., for the construction of a third track between Trimmer Junction, Ind., and Boone, 6.4 miles. The work will involve a change in grade extending over a distance of two miles and the building of six small bridges. The work has already been started, and will cost approximately \$625,000.

SALT LAKE, GARFIELD & WESTERN.—This company has completed plans for the electrification of its line and work on the project has already been started. The approximate cost of the work will be \$250,000.

Railway Financial News

BUFFALO, ROCHESTER & PITTSBURGH.—This company has applied to the New York State Public Service Commission, Second district, for approval of equipment agreement, series J, with the Guaranty Trust Company, of New York, as trustee dated July 1, 1917, and for permission to issue \$1,000,000 five per cent, series J equipment bonds, pursuant to said agreement, at not less than 90 per cent of their par value, and interest.

CHICAGO, BURLINGTON & QUINCY.—The Illinois State Public Utilities Commission has authorized this company to issue \$25,455,000 of general mortgage bonds at four per cent, payable March 1, 1958.

CHICAGO, ROCK ISLAND & PACIFIC.—Permission has been given by the Illinois State Public Utilities Commission to issue \$12,500,000 of general mortgage gold bonds at four per cent.

Clarence H. Venner, of New York City, has filed in the Sangamon County Circuit Court of Illinois an appeal from a decision of the Illinois State Public Utilities Committee authorizing the issuance of \$65,000,000 in preferred stocks at six and seven per cent by the above company. Mr. Venner, who is a stockholder, contended that the company should not issue preferred stocks in such large amounts, and objected to the plans for reorganizing the company. The appeal will be heard at the September term of court.

ST. LOUIS & HANNIBAL.—Charles W. Cox and C. Ledyard Blair, of New York, have filed a plan for the reorganization of this company with the Missouri Public Service Commission. The company operates between Hannibal, Mo., and Perry, a distance of 104 miles. The plan of reorganization provides for a new company, the waiving of all old claims, assumption of the floating debt, a new issue of preferred stock of \$250,000, and the issue of \$370,000 of new common stock.

SALINA NORTHERN.—This road, operating 81 miles between Salina, Kan., and Osborne, has been sold at auction to P. W. Goebel, president of the Commercial National Bank of Kansas City, Kan., for \$693,000.

WAUPACA-GREEN BAY.—This 10-mile line, extending from Waupaca, Wis., to Green Bay, has gone into the hands of a receiver because the interest due on \$75,000 was not paid in June. Frank B. Seymour, general manager of the Green Bay & Western, has been named receiver. The Wisconsin State Railroad Commission, in its 1916 report, valued the productive cost of the Waupaca-Green Bay, less depreciation, at \$95,777. The total indebtedness is now \$86,000. The company has until September 1 to liquidate its indebtedness or be sold under receivership.

BUDGET OF SOUTH AFRICAN RAILWAYS.—The estimates of the expenditures of the main services of the South African railways during the year ended March 31, 1918, are given at \$50,815,000, and the revenues at \$66,927,000. The expenditures of the subsidiary services are estimated at \$2,431,000, and the revenues at \$2,361,000. In the main services the revenue from freight and minerals other than coal is estimated at \$29,177,000; from coal, \$15,574,000; from live stock, \$2,372,000, and from the passenger service, \$16,310,000.—*Commerce Report.*

NEW LAW OF RAILWAY CONCESSIONS IN VENEZUELA.—The new law of railway concessions passed the Venezuelan congress, and was signed by the provisional president June 12. The principal difference between this law and the former one is that the provision by which all railways constructed under concessions became the property of the government after a specified term of years is changed, and railways to be built under the new law will be fully and perpetually the property of the parties constructing them except that such ownership may not be transferred in whole or in part to any foreign government. It is hoped that under the more liberal terms of this new law foreign capital may undertake the construction of railways, which the country so badly needs for its internal development.—*Commerce Report.*

Railway Officers

Executive, Financial, Legal and Accounting

John G. Walsh has been appointed assistant to vice-president of the Erie, with headquarters at New York.

W. A. Corkill has been elected treasurer of the Carolina & North Western, with office at Chester, S. C., vice F. Wolfe, resigned.

Dameron Black has been appointed auditor of the Atlanta, Birmingham & Atlantic, with office at Atlanta, Ga., vice R. K. Slaughter.

G. F. Moore has been appointed assistant to the president of the Pittsburgh & West Virginia, with office at Pittsburgh, Pa., vice G. G. Early.

Operating

E. A. O'Donnell has been appointed assistant superintendent of the El Paso division of the Galveston, Harrisburg & San Antonio.

M. H. McEnry has been appointed assistant trainmaster of the Delaware & Hudson, with office at Carbondale, Pa., vice A. T. Cushing, resigned.

D. C. Smith has been appointed manager for the receivers of the Georgia Coast & Piedmont, with headquarters at Brunswick, Ga., vice A. do Sola Mendes.

H. M. Gargan, assistant trainmaster of the Delaware & Hudson at Oneonta, N. Y., has been appointed trainmaster on the Susquehanna division, vice M. W. Sullivan, promoted.

Clarence R. Smith, trainmaster on the Illinois Central, at Fordham, Ill., has been appointed trainmaster of freight service, with the same headquarters, succeeding A. M. Umshler, promoted. Thomas Whitty has been appointed trainmaster at Fordham, succeeding C. R. Smith.

George F. Dickson, superintendent of the Georgia & Florida, with office at Douglas, Ga., has been appointed superintendent also of the Augusta Southern, succeeding J. A. White, resigned to accept an appointment as military transportation officer, Camp Wadsworth, Spartanburg, S. C.

S. A. Stockard, superintendent of car service of the Atlantic Coast Line, at Wilmington, N. C., has been appointed assistant general superintendent of transportation, with office at Wilmington, and his former position has been abolished; E. M. Dewey has been appointed car accountant, with office at Wilmington.

A. E. Boughner, superintendent of the St. Louis district of the Missouri, Kansas & Texas, at Sedalia, Mo., has been appointed superintendent of terminals at St. Louis; J. F. Hickey, superintendent at Muskogee, Okla., has been transferred to Sedalia; W. M. Whittenton has been appointed superintendent of the McAlester district, with headquarters at Muskogee, Okla., succeeding Mr. Hickey.

Richard E. Casey, who has been appointed superintendent of the Grand Rapids & Indiana, with headquarters at Grand Rapids, Mich., was born at Union City, Ind., on October 6, 1868. He entered railway service with the Grand Rapids & Indiana on November 12, 1888, as a telegraph operator. Two years later he was promoted to ticket agent at Kalamazoo, Mich., and in April, 1893, became traveling passenger agent, with headquarters at Grand Rapids. In December, 1897, he was appointed trainmaster at Ft. Wayne, Ind., which position he held until his recent appointment as superintendent of the Northern division.

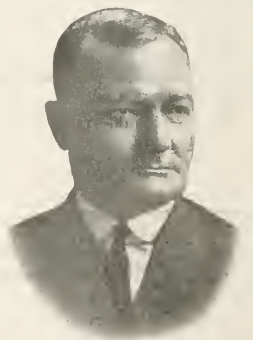
A. E. Brown, trainmaster of the Sacramento division of the Southern Pacific at Sacramento, Cal., has been appointed assistant superintendent of the Tucson division, succeeding T. H. Kruttschnitt, resigned to enter military service; C. F. Donnatin, trainmaster of the Los Angeles division at Los Angeles, has been appointed assistant superintendent of that division, with the same headquarters; F. J. Berry, trainmaster at Truckee, has been transferred to the Sacramento division, with headquarters

at Sacramento; C. A. Collins succeeds Mr. Berry as trainmaster at Truckee; J. C. Muir, trainmaster at Bakersfield, has been transferred to the Los Angeles division, with headquarters at Los Angeles.

Edward F. Blomeyer, whose appointment as general manager, in charge of the operating and traffic departments, of the Ann Arbor and the Manistique & Lake Superior, was announced in the *Railway Age Gazette* on June 29, was born at Farmington, Mo. He entered railway service with the St. Louis, Iron Mountain & Southern as a telegraph operator, and later served successively as agent and train despatcher. He afterward became auditor of the Southern Missouri & Arkansas, following which he was promoted to freight and passenger agent. Several years later he was promoted to vice-president and general manager of the St. Louis, Memphis & Southeastern, which position he held until he became president and general manager of the Pere Marquette Steamship Company, and the Manistique, Marquette & Northern. Following this he was for several years vice-president and general manager of the Tennessee, Alabama & Georgia, and for a short time was vice-president and traffic manager of the San Antonio, Uvalde & Gulf, which position he held until his appointment as general manager of the Ann Arbor and the Manistique & Lake Superior.

Traffic

Dexter M. Denison, general freight agent of the Minneapolis & St. Louis, has been appointed freight traffic manager, with headquarters at Minneapolis, Minn., effective August 1. He was born at Hamlet, N. Y., on July 24, 1866, and entered railway service in July, 1882, as a night telegraph operator, with the Minneapolis & St. Louis. He was later promoted to local freight agent, and served in this capacity at various stations until his appointment as traveling freight agent. He next became commercial agent at Minneapolis, following which he served successively as assistant general freight agent and general freight agent, with headquarters at Minneapolis. On August 1, 1917, he was promoted to freight traffic manager, succeeding F. C. Townsend, who has been promoted to vice-president in charge of traffic.



D. M. Denison

Wallace Smith has been appointed commercial agent of the Ocilla Southern, with office at Ocilla, Ga.

R. L. Butt has been appointed general freight agent of the Carolina and North Western, with office at Atlanta, Ga.

E. B. Leavitt has been appointed industrial agent of the Southern Pacific, with headquarters at San Francisco, Cal.

A. W. Saunders, assistant general freight agent of the Carolina, Clinchfield & Ohio, at Johnson City, Tenn., has resigned, and his former position has been abolished.

G. G. Early, assistant to president of the Pittsburgh & West Virginia at Pittsburgh, Pa., has been appointed general freight and passenger agent, with office at Pittsburgh, vice S. P. Woodside.

J. W. Hunter, general freight agent of the Southern Railway at Atlanta, Ga., has been appointed general freight agent, with office at Charlotte, N. C., succeeding Walter Shipley, who has entered the service of the American Railway Association.

I. K. Dye, traffic manager of the Coal & Coke Railway at Elkins, W. Va., having resigned to engage in other business, W. Trapnell, superintendent, is now in charge of the traffic and industrial development department, with office at Elkins, W. Va., and W. E. Leith has been appointed acting general freight and passenger agent, with office at Elkins.

B. F. Moffatt, assistant general freight agent of the Minneapolis & St. Louis, has been appointed assistant freight traffic manager, with headquarters at Minneapolis, Minn.; W. M. Hardin, assistant general freight agent, has been promoted to general freight agent, and C. A. Werlich, chief of the tariff bureau, has been appointed assistant general freight agent, with headquarters at Minneapolis, effective August 1.

A. B. Cutts, general passenger agent of the Minneapolis & St. Louis, has been appointed passenger traffic manager, with headquarters at Minneapolis, Minn. He was born at Lillington, N. C., on October 23, 1866, and entered railway service with the Chicago & Alton on December 1, 1884. In 1887 he became chief ticket clerk for the Chicago, St. Paul, Minneapolis & Omaha, and from 1890 to 1892 he was chief rate clerk for the Great Northern. On the latter date he became chief rate clerk to the general passenger agent of the Minneapolis & St. Louis, and in August, 1894, was promoted to general passenger agent, which position he held until his appointment as passenger traffic manager, as above noted.

Engineering and Rolling Stock

A. G. Nutting has been appointed supervisor of signals on the Northern Pacific, with headquarters at Livingston, Mont., succeeding E. A. Allen, resigned, effective August 1.

W. C. Hawkins has been appointed engineer maintenance of way of the Coal & Coke Railway, with office at Gassaway, W. Va., vice F. D. Cosner, resigned to engage in other business.

A. D. Williams, master mechanic on the Southern Pacific at Stockton, Cal., has been appointed superintendent of motive power of the Northern district, with headquarters at Sacramento, succeeding D. P. Kellogg, resigned to accept service with another company.

J. H. Barber, resident engineer of the Canadian Pacific at West Toronto, Ont., has been appointed engineer in charge of double tracking, North Toronto, and H. R. H. Silcox has been appointed resident engineer, Toronto Terminals, in place of Mr. Barber, both appointments being only temporary.

W. M. Post, inspector of signals on the Pennsylvania, at Philadelphia, Pa., has been appointed assistant signal engineer, with the same headquarters, succeeding C. C. Anthony, resigned. W. N. Spangler, inspector of signals at Philadelphia, succeeds Mr. Post. E. L. Watson, supervisor of signals at Philadelphia, has been appointed inspector of signals, succeeding W. N. Spangler. Guy Toft, acting supervisor of signals of the Pittsburgh division, has been appointed supervisor of signals of the same division. H. N. Stump, acting supervisor of signals of the Williamsport division, has been appointed supervisor of signals of that division. E. G. Bauman, acting supervisor of signals of the Allegheny division, has been appointed supervisor of signals of the Allegheny division.

W. H. Bradley, master mechanic on the Chicago & North Western at Clinton, Ia., has been appointed assistant to the general superintendent of motive power, with headquarters at Chicago, Ill., succeeding E. C. Hall; W. E. Dunham, supervisor of motive power and machinery at Winona, Minn., also has been appointed assistant to the general superintendent of motive power, with headquarters at Chicago; J. W. Anderson, master mechanic of the West Iowa division at Boone, Ia., has been appointed supervisor of motive power and machinery at Winona; L. Chapman, division master mechanic at Belle Plaine, Iowa, has been transferred to the West Iowa division, with headquarters at Boone; H. L. Harvey, road foreman of engines on the Wisconsin division, with headquarters at Chicago, has been appointed master mechanic of the Iowa and Minnesota division, with headquarters at Belle Plaine.

Railway Officers in Military Service

W. J. Leahy, general passenger agent of the Chicago, Rock Island & Pacific, at Chicago, who received a commission as major in the Quartermasters' Officers' Reserve Corps, has been released from active service in the army.

John Lawrence Maher, assistant engineer in the office of the district engineer maintenance of way, Northwest district, of the Baltimore & Ohio, has been commissioned a captain in the Officers' Reserve Corps, U. S. A., and is waiting instructions from the adjutant general to report.

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We publish elsewhere two very interesting and important addresses on the part of the railways in the war. One is

Two Addresses on the Railways in the War

by Daniel Willard, president of the Baltimore & Ohio, and chairman of the Advisory Commission on National Defense. The other is by E. E. Clark, a member of the Interstate Commerce Commission. Both Mr. Willard as chairman of the Advisory Commission and Mr. Clark as the representative of the Interstate Commerce Commission have been sitting with the Railroads' War Board and participating in its deliberations. No other man in the United States is better informed regarding the war problems confronting the people of the country or the part which the railways ought to and must play in the solution of those problems than Mr. Willard, and it is to be wished that his address could be read not only by every railway officer and employee, but also by every citizen. It is a very able and remarkable document and coming from such a source it ought to stimulate every reader of it to help the railways in every way practicable to do their bit. No other public officer is so well informed regarding what the railways are doing under the supervision of the Railroads' War Board to perform their duty to the country as is Mr. Clark, and therefore his cordial endorsement of the objects being sought and the methods being used is gratifying and full of promise as to the prospects of the close co-operation which doubtless will be needed in future between the war board and the Interstate Commerce Commission.

Such railroads as have adopted modern apprenticeship methods in their mechanical departments (and the number

Intensive Training of New Employees

is discouragingly small) have looked largely to the future for results, rather than for any immediate returns. The facts that were marshalled by John H. Linn in the article on "By-Products of an Apprenticeship System," which was published in the *Railway Age Gazette* of August 10, 1917, indicate that the Santa Fe received many concrete returns from the very beginning of the installation of the new apprenticeship system; in-

deed, these by-product returns in the aggregate were probably sufficient to justify the movement on a strictly business basis, without reference to the main result which it was desired to accomplish. Passing reference only was made to one advantage which is of special importance at this time. Railroads generally have had to employ many new hands in the mechanical department, and whether these are mature men, or girls and women, the apprenticeship organization can readily be adapted to give them intensive practical training and rapidly fit them for the efficient performance of their duties. Moreover, it should be comparatively easy to adapt and extend methods of training which have proved successful in the mechanical department to other departments. Unless immediate and adequate steps are taken to train new employees in all departments the effectiveness of the railroads at large may be greatly hampered. It is unfortunate that so few roads have awakened to their full responsibilities in this direction, and it is sincerely to be hoped that those which have lagged behind will make a prompt and decided effort to catch up with the leaders.

The average freight rate per ton per mile received by the railways of the United States in 1916, 7.16 mills, was the

Lowest Average Freight Rate on Record

lowest on record. This fact, indicated by the preliminary summary of returns for roads earning over \$1,000,000 a year issued by the Bureau of Railway Economics in February and commented upon in these columns at the time, is now officially confirmed by the abstract of statistics for the fiscal year ended June 30, 1916, just issued by the Interstate Commerce Commission. For the million dollar roads the average receipts per ton mile were 7.07 mills, as compared with 7.22 for the previous year. The commission's figures cover all roads in the country having total operating revenues of over \$100,000 a year. The average of 7.16 mills in 1916 compares with 7.32 in 1915, 7.33 in 1914, and 7.29 in 1913. Never before, since the Interstate Commerce Commission began publishing railway statistics, has the average revenue per ton mile been below 7.24, which was the figure for 1899. In 1891, the earliest year for which the commission has the

record, the average was 8.95 mills. Until 1899 there was a general decline and from that year until 1904 there was an increase to 7.80 mills. Since that year the average has pretty steadily declined. The average revenue per ton per mile for freight for each year from 1891 to 1916 as reported by the commission has been as follows:

1891..... 8.95 mills	1900..... 7.29 mills	1909..... 7.63 mills
1892..... 8.98 mills	1901..... 7.50 mills	1910..... 7.53 mills
1893..... 8.78 mills	1902..... 7.57 mills	1911..... 7.57 mills
1894..... 8.60 mills	1903..... 7.63 mills	1912..... 7.44 mills
1895..... 8.39 mills	1904..... 7.80 mills	1913..... 7.29 mills
1896..... 8.06 mills	1905..... 7.66 mills	1914..... 7.33 mills
1897..... 7.98 mills	1906..... 7.48 mills	1915..... 7.32 mills
1898..... 7.53 mills	1907..... 7.59 mills	1916..... 7.16 mills
1899..... 7.24 mills	1908..... 7.54 mills	

The decrease in 1916 is probably attributable mainly to the increase in the proportion of low-rated commodities during the year, principally of coal and other products of mines. The commission's report also shows that the average operating expenses per train mile increased from \$1.77 in 1915 to \$1.83 in 1916. The fact that the railways were able to show the largest gross and net earnings in their history in the face of such an increase in operating costs while receiving a lower average rate than ever before is therefore attributable to a remarkable increase in efficiency of operation. How this was accomplished is illustrated in the commission's report by the fact that the average number of tons of freight carried in each train was increased from 474.45 in 1915 to 534.95 in 1916.

THE BURLINGTON'S EXTRA DIVIDEND

THE declaration by the Chicago, Burlington & Quincy Railroad Company of an extra dividend of 10 per cent will be the subject of much discussion. Whether those who discuss it will approve or disapprove of the action taken will depend on the relative amounts of stress that they put on a railway's function as a business concern and its function as a public service concern.

A railway, the courts have held, is private property affected with a public use. There was a time when railway owners entirely subordinated the public duties of the railway to the object of making money out of it as private property. More recently not only the regulating authorities, but even the owners and the managers of the railways, have to a large extent subordinated the purely business or money-making side of the railroad to its function as a public utility.

The case of the Burlington is a good illustration of the extent to which for some years the railway as private property has been subordinated to the railway as a public servant. The road was laid out and has been developed with great strategic skill. It has been managed with almost unsurpassed progressiveness and ability and it has been conducted financially with great conservatism. Although it has always been one of the most important of the granger systems, its average capitalization per mile on the basis of mileage owned at the end of the year 1916 was only \$31,854, and on the basis of mileage operated it was only \$30,600. Its total earnings, its operating efficiency and its net earnings have steadily increased, while there has been practically no increase in its funded debt. The percentages earned by it on its stock—after the payment of interest on funded debt, of course—in the eight fiscal years ending with June 30, 1916, were as follows: 1909, 11.74 per cent; 1910, 12.6 per cent; 1911, 15.79 per cent; 1912, 13.32 per cent; 1913, 18.12 per cent; 1914, 16.97 per cent; 1915, 17.18 per cent; 1916, 26.93 per cent. The fiscal year was changed last year to correspond with the calendar year, and in the year ended on December 31, 1916, the earnings on the stock were almost 29 per cent.

An extra dividend of 6 per cent was paid on October 1, 1907, but since then, in spite of the large earnings made, the same dividend—at the rate of 8 per cent—has been paid on the same amount of stock. What has been done with the

rest of the money? From \$655,000 to \$1,817,000 a year has been applied to sinking funds and from \$2,268,000 to \$7,648,000 a year has been appropriated for additions and betterments. Meantime, the property has been so maintained that it has been getting into better and better condition.

Certainly any concern in any other line of business which could show such a record for efficient management and financial conservatism over a long period of years would not be criticised on business or any other grounds for declaring an extra dividend of 10 per cent.

But what of the public policy involved? Will not the management of the Burlington be criticised for declaring this extra dividend, and will not it tend to arouse a popular antagonism to railways which will do them all harm? The Burlington is a granger road operating in a territory where popular hostility to railways is and always has been greater than in any other section of the country, and undoubtedly its action in declaring this extra dividend under present conditions will draw criticism upon its management and will also be made a ground for attacking the managements of railways generally.

But, as a matter of fact, the large earnings which the Burlington has been making have constantly over a long period of years been used by critics of the railways to show that the railways generally were more prosperous than they admitted that they were and that therefore their rates ought to be reduced instead of increased. Perhaps there will be no more criticism because the Burlington has declared this dividend than there has been because it has been earning enough money to declare it.

Meantime, the facts should be pointed out that the Burlington is not a typical railroad in any respect whatever. Its capitalization per mile is so small in relation to the total traffic handled, to its total earnings and to its net operating income that if the rates in its territory were so regulated as to restrict its net operating income to 6 or 7 per cent, it would soon be about the only solvent railway left in the territory. It may be said, however, that even though this is the case it should use the earnings on its stock in excess of its 8 per cent dividend to develop its property in order that it may render more and better public service. But this is precisely what it has been doing for ten years, and this extra dividend spread over that period makes an average of only 9 per cent that it has paid.

So long as the public does not fix a minimum return which railways will be allowed to earn and pay, it has no moral right to fix a maximum return which they may earn and pay. As a matter of business policy the action of the Burlington in declaring the extra dividend is perfectly sound and defensible. As a matter of railroad public policy, having in mind the railroad situation of the country as a whole, it is questionable if it was expedient.

ANOTHER HEAVIEST ENGINE

THE gradual increase in the weight of locomotives is ever a matter of vital concern to the bridge engineer. He is not only responsible for the safety of bridges under the loads imposed by new locomotives purchased by his road and by new engines in transit to other roads, but he has ever before him the perplexing problem of the designing load for new bridges. This must be great enough to insure adequacy of the structures for many years to come and yet not so great as to result in extravagance for which he may later be criticized not unjustly.

Unfortunately there is no direct relation between the weight of the locomotive and its capacity to produce stress in a structure. Even an expression of the average weight of the engine per foot of track is of little value. The only reliable criterion is a determination of the actual bending moments and shears for spans of varying length and a com-

parison of these with the equivalent results secured with the arbitrary Cooper's loading commonly used in designing. For the design of shorter spans or the floor systems of bridges, the magnitude of the individual axle loads together with the dynamic augment of the over balance are the determining factors rather than the weight of the entire locomotive, but these also involve analyses along the lines outlined above which are withal tedious and expensive.

Results of such analyses show that the Santa Fe type locomotives produce generally higher loading effects on spans under 60 ft. in length than locomotives of the Mallet class. A monograph by A. C. Irwin, in the proceedings of the American Railway Engineering Association for 1915, showed that 2-10-2 locomotives purchased by the Burlington in 1912 gave a classification equivalent to Cooper's E-66 for a span of 50 ft., higher than that obtained for any span with any locomotive other than the Erie triplex and the 2-10-10-2 Mallet of the Atchison, Topeka & Santa Fe, both of them exceptional engines in special service. In view of this, particular interest is attached to the Santa Fe type locomotives now in service on the Denver & Rio Grande, the heaviest of this class built thus far, which were described in the *Railway Age Gazette* of August 3, page 189. These locomotives produce loading effects equivalent to Cooper's E-68 for spans of 30 ft. to 60 ft. inclusive.

This is not a phenomenal increase for a period of five years, but it demonstrates clearly that while the general tendency is toward an increase in the length of locomotives to attain greater power, the limit of the weight to be applied within the limits of one set of coupled wheels has not yet been reached. What this limit will be, how much greater the load to be placed on a single driving axle and what reduction can be made in the dynamic augment are the questions which perplex the bridge engineer today, rather than the ultimate total weight to be secured in some multiplex locomotive of extended length.

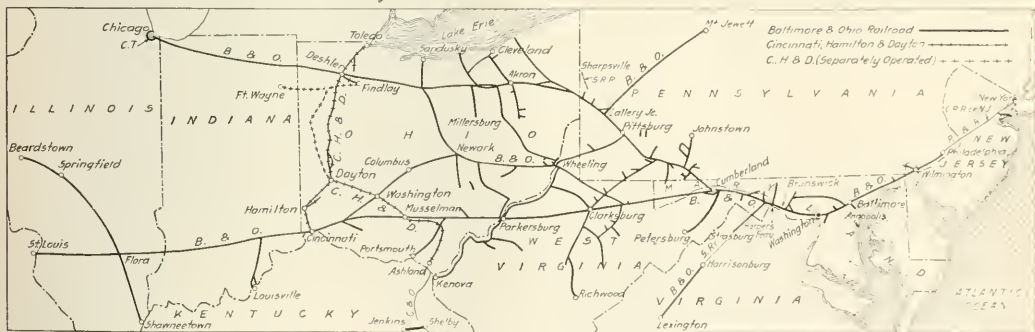
BALTIMORE & OHIO

IF a man had a business that was earning \$90,000 a year in 1910 and bringing him in a net income of well over \$16,000 a year, and between 1910 and 1917 borrowed, at 5 per cent interest, \$145,000 for improvements to his plant, besides putting in some of his own money each year, and for the calendar year 1916 did a gross business of \$117,000

000. In the calendar year 1916 it earned \$116,969,000 gross, but had only \$12,563,000 available for dividends. During this period the company had borrowed, through the issue of bonds and equipment trust notes, in round numbers \$146,000,000, and the fact that it was able to get this money at approximately 5 per cent on the average, shows how good the credit of the company was. In all, the company's investment increased during these years \$157,400,000. The difference between \$146,000,000 and \$157,400,000 is accounted for by surplus invested in the property and accrued depreciation charged out in expenses and spent for additions and betterments.

When Daniel Willard went to the Baltimore & Ohio as president he found a contract requiring the taking over by the Baltimore & Ohio of the Cincinnati, Hamilton & Dayton. This was a transaction which, although closely connected with the actual operation of the Baltimore & Ohio, is not, strictly speaking, railroading. Up to the present this transaction has not proved profitable to the Baltimore & Ohio, and of the total \$157,400,000 investment made in 1910-16, \$25,000,000 stands on the books as the amount charged against the Cincinnati, Hamilton & Dayton transaction and on which amount the Baltimore & Ohio is not earning any return. Except for this Cincinnati, Hamilton & Dayton left over contract no one, probably, not excepting Clifford Thorne, would say that under the management of Mr. Willard the Baltimore & Ohio has engaged in any transactions other than the most conscientious production of transportation at the lowest cost of which the plant and organization was capable.

In one sense the operation of the Baltimore & Ohio in the years 1910 to 1916 inclusive has been successful. The additions and betterments which have been made during these years were absolutely essential both to the continued solvency of the Baltimore & Ohio and to its ability to handle the business offered and to perform the service absolutely required from it by its patrons. Even, however, if it had been possible to disregard the necessities of the shipping and traveling public, if \$6,000,000—approximately the increase in costs due to higher wage scales—\$1,500,000—the increase in taxes—and \$6,500,000—the increase in costs of material—had been imposed on the operation of the plant as it stood in 1910, bankruptcy would have been the result sooner or later. The company has, however, actually raised \$146,000,000 at 5 per cent and is earning today its 5 per cent on



The Baltimore & Ohio

but had profits in that year of only \$12,500, we would be inclined to say that there was something wrong either with the business or the management of it. This is exactly analogous to what happened to the Baltimore & Ohio in the period 1910-16, inclusive. In 1910 the company earned \$90,163,000 gross and had available for dividends \$15,832,-

this new money and sufficient to pay 5 per cent on its common stock, with a small surplus—\$2,612,000. Other railroads have been going along somewhat the same path as the Baltimore & Ohio; but there is one particular in which the Baltimore & Ohio, if not unique, at least very unusual.

The expenditures for additions and betterments are di-

vided approximately as follows: Improvement of the existing railroad, \$58,700,000; equipment, \$62,000,000; construction of a 3.5-mile road in Kentucky, \$5,700,000; construction of an 8-mile road in West Virginia, including purchases of real estate and terminals, \$6,000,000; and the Cincinnati, Hamilton & Dayton investment standing now at \$25,000,000. The Cincinnati, Hamilton & Dayton, although it has added something to the traffic of the Baltimore & Ohio and in the future may add much more, besides of itself proving profitable, may be considered as negligible in making for economies of operation of the parent system in the period 1910-16. The Kentucky and West Virginia lines developed new sources of traffic, but did not make for operating economies. The expenditure of \$58,700,000 for improvement to the existing railroad was nearly all for improvements which eliminated congestion, permitted of the possibilities of better service, or permitted the use of heavier locomotives. Very little of this amount was spent for grade reduction. Of the \$62,000,000 spent for equipment the greater part would have had to be spent to handle the business and only the smaller part may be said to have been spent for the purpose of achieving operating economies. In other words, none of the Cincinnati, Hamilton & Dayton expenditure, none of the short line construction expenditures, little of the additions and betterments expenditures and only a part of the equipment expenditures were for improved facilities permitting of operating economies. Nevertheless, it has been through operating economies that the Baltimore & Ohio has been able to pay its great increase in interest charges, its great increase in labor costs and costs of materials, and remain a sound, dividend-paying property.

Before attempting to describe some of the methods which have been used to accomplish this remarkable result it is proper to summarize the important improvements and additions which have been made to the railroad, and from the following summary it will be seen that what has been said about the comparatively small expenditures for grade reduction to lower the cost of operation is literally true.

MORE IMPORTANT CONSTRUCTION AND IMPROVEMENTS TO ROAD

1910

A double-track bridge over the Susquehanna river was completed January 6, 1910.
Connection with bridge over the Monongahela river between Haywood, W. Va., on the Monongah division, and Lumberport, W. Va., on the Ohio River division (to relieve the Wheeling division), was opened June, 1910.
A double-track bridge over the ship canal at Indiana Harbor was built. New stations were built at four places.

1911

Changes of line and grade reduction were made, Concord to Wilmington.
A third-track was laid on the Cumberland division for 43 miles.
Tunnels were converted to open cuts at Everett's, McGuire's, Rodemer and Murray.
A 7-mile third-track was laid on the Connellsville division.
The Quemaoming branch was extended 9 miles.
Interlocking was built at eight places.
Automatic signals were installed on 105 miles.
New handling machines were erected at 14 places.
Station facilities were enlarged or built at 14 places.
A drawbridge over the Cuyahoga river at Cleveland was built.

1912

Grade was reduced at the east end of the Susquehanna river bridge.
A single-track tunnel at Bakerstown, Pa., was eliminated.
Grade revision and construction of a double-track tunnel was completed between Blanes and west end of the Kingwood tunnel, W. Va. (Gives three tracks over this summit and shortens haulage grade four miles.)
A classification and receiving yard was built at Lorain, Ohio.
Additional yard facilities were built at 20 places.
There were 42 miles to second track and 9 miles to third track and 6 miles to fourth track laid.
New stations at nine places and station buildings at Baltimore and Cumberland, Md., were extensively remodelled.
There were 12 new interlocking plants built and 7 rebuilt.
Automatic signals were installed on 19 miles of double track and 20 miles of single track.
Electro manual block signals were installed on 23 miles.

1913

Transfer bridge and float were installed at the Canton terminal.
Additional tracks with 700 cars capacity were laid at the Curtis Bay (Md.) classification yard.
A tie and timber treating plant was put up at Green Springs, W. Va.
An interchange yard was built at Cumbo, W. Va.

THE BALTIMORE AND OHIO RAILROAD COMPANY.

Form 3-2-11

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Form 3-2-11

The Chicago division was double tracked (work was begun in previous years and completed in following years).

A double-track tunnel between Sand Patch and Manila was completed, giving a double-track line from Philadelphia to Chicago, with the exception of one section of double-track work on the Chicago division. Two new stations were built and three were enlarged. There were 17 new interlocking plants built and 13 rebuilt. Automatic signals were installed on 65 miles and line control block system installed on 23 miles.

1914

A third track between Green Springs and Little Cacapon, W. Va., 7.6 miles, was built, giving a three-track line from Little Cacapon to Patterson Creek, 14.4 miles, where the track density even in 1913 was 20,000,000 ton-miles per mile of road.

At South Cumberland new engine facilities were built.

Two new stations were built and one was remodeled. There were nine new interlocking plants built, one rebuilt and six rearranged.

Automatic signals were installed on 176 miles.

A new concrete warehouse with 155,000 sq. ft. of available storage space was built at New York City.

An open pier for handling ore at Locust Point was reconstructed and extended.

A new yard for assembling coal at Somerset, Pa., was completed.

1915

The new double-track line and relocation of the old line between Okonoko and Orleans Road, W. Va., known as the Magnolia cut-off, was completed, permitting an increase in eastbound slow freight trainload of 36.36 per cent and shortening the distance 5.78 miles. This gives a three-track road all the way from Patterson Creek to Cherry Run, W. Va., 57 miles, where by 1911 traffic density amounted to 24,000,000 ton-miles per mile of road.

Two new stations were built.

There were three interlocking plants built and four reconstructed.

Automatic signals were installed on 18 miles.

Various grade crossings were eliminated.

Bridges at various points were strengthened.

1916, to June 30.

A new outbound freight house was built at New York.

A new export pier was built at Locust Point, Baltimore, and three open piers were reconstructed.

A fireproof coal pier with a capacity of 6,000 tons per hour was built, although not completed, at Curtis Bay, Baltimore.

The Pittsburgh passenger station was remodeled and four new stations were built at various points.

Automatic signals were installed on 48 miles of road.

Two interlocking plants were built.

1916, June 30 to December 31

A new yard was built at Somerset, Pa.

The last of the double tracking of the Chicago division was almost completed.

Automatic signals were installed on 82 miles.

A part of the \$62,000,000 spent for equipment was for passenger service equipment and so added little to the possibility of operating economies, and a part was for freight cars which only to a limited extent afforded greater possibilities for operating economies. It was in the purchase of heavier and more effective freight locomotives that the Baltimore & Ohio got a part of its increase in operating efficiency. The following is a list compiled from records of the *Railway Age Gazette* showing the type and number of locomotives bought in the years 1910-16, inclusive:

Year	Number	Weight	Type	Builder
1910	203	220,300	Consolidation	A. and B.
	10	260,000	Pacific	B.
	40	270,000	Mogul	B.
	5	457,000	Mallet	B.
	5	460,000	Mallet	A.
	26	214,700	American	B.
1911	10	164,750	Mogul	B.
	10	461,000	Mallet	A. s
	10	271,040	Pacific	B.
	30	277,190	Pacific	B. s
	140	276,050	Mikado	B.
	10	282,200	Mikado	B. s
	10	282,200	Mikado	B. s
1912	50	282,200	Mikado	B. s
	4	120,000	4-Wheel Switcher	B.
1913	10	471,000	Mallet	A. s
	30	248,600	Pacific	B. s
	110	284,500	Mikado	B. s
1914	1	407,060	Santa Fe	B. s b
	30	410,200	Santa Fe	B. s b
1915	15	485,000	Mallet	A. s b
	15	485,000	Mallet	A. s b
1916	50	281,900	Mikado	B. s b
	30	.....	Mallet	B. s b
	10	.....	Pacific	B. s b
	10	178,500	Mogul	L. s b

A, built by American Locomotive Company.

B, built by Baldwin Locomotive Company.

s, equipped with superheater.

b, equipped with brick arch.

The total tractive effort of freight locomotives at the beginning of 1910 was 46,300,000 lb.; the total tractive effort

at the end of 1916 of freight locomotives was 79,189,000 lb. This is an increase of 71 per cent.

In 1910 the Baltimore & Ohio carried 12,024,600,000 ton-miles of revenue freight and total revenue freight train mileage amounted to 27,182,000. In 1916 the road carried 16,199,800,000 revenue ton-miles and the revenue freight train mileage was 21,573,000. In other words, the road is furnishing more than a third as much more transportation for freight in 1916 than in 1910 and is performing this service with a fifth less train mileage.

Here, then, in a nutshell is the explanation of how the Baltimore & Ohio has won through in the struggle to make both ends meet during the period 1910-16. By the purchase of heavier freight locomotives it has placed at the disposal of the operating forces of the road a means of greatly increasing the trainload. By supervision and good management it has made actual the heavier trainloads which the larger engines made possible. The average trainload in 1910 was 442 tons; in 1916, 751 tons.

There appears to be a consistently pursued policy in the relation between President Willard and his staff of officers and between the management and employees. The keynote of this policy appears to be an attempt to lead rather than to drive. In the relations between the management and employees this policy is manifest in the adoption of the Brown system of discipline; in the organization of frequent meetings of various classes of employees under the auspices of the employees themselves for free discussion of grievances and suggestions for improvements, and is typified by President Willard's address to the officers of the Baltimore & Ohio at the annual meeting at Deer Park on June 29, 1917, one sentence from which may well be quoted: "If we could only get all the 60,000 employees of the Baltimore & Ohio to look at this thing in the right way—not necessarily my way, but what seems in our common minds to be the right way—if all can only appreciate how much is involved, and the extent to which the railroads can and must help, the things that the employees of the Baltimore & Ohio alone can do toward creating a better state of mind, a better public opinion behind the government carrying on the war—the good that they can do in that respect would be immeasurable."

There have been examples, especially among the older generation of railroad men, of a road being run very successfully by the driving process. Officers knew that if a bad showing was made the consequence to them would be serious. It was left largely to the officer himself, however, to devise ways and means for making a good showing. An important factor in the results of operation of the Baltimore & Ohio in the years 1910-16 has been the method of supervision adopted over the work of the superintendents.

The general management's supervision over the division superintendent's work aimed at stimulating the superintendent, and through him his officers and the division employees, to the greatest interest and resourcefulness in their work; helping the superintendent analyze his own conditions so as to discover the places where improvement was possible; checking waste before it got fairly started, and providing a means of comparing divisional performance day by day with a standard of what could be done.

The initial step in the adoption of a standard by which to measure wage cost per ton-mile on the Baltimore & Ohio was the keeping of an accurate record of individual train performance over each district. Fig. 1, with the last three columns omitted, shows the form used to keep this record. All of the information on this form is supplied by the train sheets, supplemented in the case of local freight by a special report made by the conductor showing set-outs and pick-ups.

Supplemental to these reports for each division the general officers of the Baltimore & Ohio made in conference with the division officers a first-hand study of the conditions which effected operation over each freight district. Each point of

delay was studied and the causes for the delay at this point analyzed. After a great deal of thought had been given the matter a time card was drawn up for each district showing the time which could be consumed at each point of delay and the necessary speed between these points to insure getting over the district without overtime. These cards were distributed to engine and train crews and to division officers. The time schedules and the tonnage rating of the locomotives in service gave a basis on which to determine ton-mile cost for engine and train crew wages over each district. This cost was then adopted as standard and the actual performance of each train could then be measured in a per cent of standard or perfect operation. In this way the last three columns on Fig. 1 were added. Each division superintendent also was furnished with cards on which he could keep the average record for slow freights for each day on each of the districts under his jurisdiction.

In-so-far as engine crews and train crews are concerned, the standard schedule gives them an object toward which they can work and an incentive and interest in attaining this object which is real and valuable, notwithstanding the fact that it is largely psychological. In-so-far as the superintendent and his officers are concerned, the daily reports of ton-mile costs, with the comparison which they afford with the standard or theoretical minimum costs, give an incentive for the most careful supervision over the performance of each and every train, and furthermore do not tend to diminish the value of initiative and ingenuity in handling traffic. For instance, the standard schedule is based on making no overtime. A given train, however, may make a certain proportion of overtime and because it is hauling a greater tonnage than its rating requires still make a perfect record and a showing of ton-mile cost as low as the standard minimum.

After standards for each division had been established, each superintendent's record was kept on a form similar to that shown in Fig. 2. This has been the basis of the management's supervision over division officers, and it is thought that these records have contributed much to success obtained in economical operation.

The Baltimore & Ohio's outlook for the future is dependent on the general railroad situation. The economies which can be effected by increased trainloading without quite impossible expenditures for grade reduction have apparently almost been reached. If increased cost cannot be offset in this way the question arises as to how they can be offset. The limitations of improved supervision and management have pretty surely not been reached; better carloading by shippers is a possibility; but there seems to be a very slight chance that any such great percentage of increased efficiency can be made in the next six and a half years as was made in the period 1910-16. On the other hand, the percentage of increase in costs of operation, due to higher wages and higher costs of materials, are mounting at a far greater rate than they did in the 1910-16 period. The future prospects of the Baltimore & Ohio are, it would appear, largely dependent on the Interstate Commerce Commission.

Although these comments have dealt almost entirely with the comparison between the beginning and end of the period 1910-16, the usual table showing the principal figures for operation in 1916 as compared with 1915 is given in order that uniformity may be preserved with the reviews of this company's annual reports in previous years.

The following table shows the principal figures for operation in the calendar year 1916 as compared with the calendar year 1915:

	1916	1915
Mileage operated	4,545	4,533
Freight revenue	\$91,891,921	\$79,255,266
Passenger revenue	16,169,173	13,982,463
Total operating revenue	116,968,882	100,717,666
Maintenance of way and structures	14,825,302	10,472,891
Maintenance of equipment	23,569,581	18,755,014
Traffic expenses	2,113,268	1,908,552

Transportation expenses	40,564,932	33,584,941
General Expenses	2,624,870	2,359,812
Total operating expenses	84,460,293	67,652,602
Taxes	4,002,736	3,404,943
Operating income	28,465,597	29,633,210
Gross income	34,555,277	34,937,607
Net income	12,652,675	15,575,410
Dividends	9,951,753	9,951,753
Surplus	2,611,608	3,664,463

ST. LOUIS SOUTHWESTERN

GOOD as was the showing which the St. Louis Southwestern made for the calendar year 1916, it was by no means as good as it would have been if the road had not been seriously handicapped by car shortage; nor was it as good as that which will be made in 1917 if present indications are to be trusted. The St. Louis Southwestern is getting back on its feet, but there may be danger that in enthusiasm over the present earnings and prospects for the immediate future, stockholders may lose sight of how much has to be done to entirely rectify a situation which two years ago was rather serious. For the calendar year ended December 31, 1916, the company had \$2,222,000 available for dividends, but the board of directors very wisely, it would appear, did not resume dividends on the preferred, although there is only \$20,000,000 preferred stock.

The process through which the St. Louis Southwestern is now going is one of very thorough physical rehabilitation accompanied by a conservation of financial resources and a really remarkably successful effort to take full advantage of the present period of large railroad gross earnings through operating economies. Although the improvements made in operating methods during the process of rehabilitation and under conditions of extreme car shortage are more interesting to railroad men and are really more unusual than the financial and physical rehabilitation, it is necessary to fully understand the conditions under which the new management is working to appreciate the extent of the success in operation. For some time previous to 1916 the St. Louis Southwestern had not been fully maintained. This was especially true in regard to equipment. Like many other roads, the St. Louis Southwestern found it necessary to cut down appropriations for maintenance, but it was particularly unfortunate in that the expenditures which it did make were not as effective as they ought to have been. The consequence was that when the present great increase in traffic occurred it found the property threadbare in places. Luckily, possibly, the general railroad bond market was such as to preclude the possibility of a road like the St. Louis Southwestern selling a large issue of bonds. Had things gone on as they were apparently going before 1916 and had no large increase in traffic occurred, the road might well have suffered the same fate as so many other southwestern roads. With, however, the advent of a new executive and operating management and a marked change in policy toward maintenance there came also a great increase in earnings, and with this increase in gross a chance to rehabilitate the property, not through the issue of receiver's certificates, but through surplus earnings.

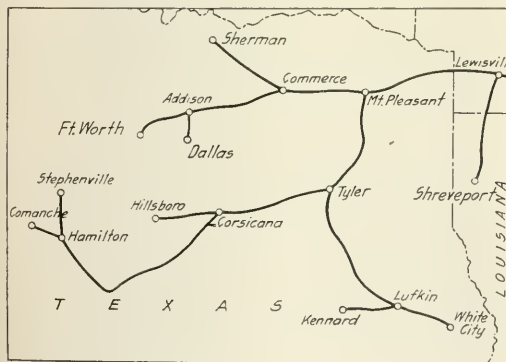
During the six months ended December 31, 1916, \$860,000 was spent for maintenance of way and structures, an increase of \$228,000, or 36 per cent, over the amount spent in same period of 1915, and \$1,360,000 was spent for maintenance of equipment, an increase of \$300,000, or 28 per cent, over same period of 1915; and despite high prices, the expenditures for maintenance, especially of equipment, were far more effective per dollar spent in 1916 than in the year 1915.

The equipment situation was the most serious one which confronted the new management. A program was laid out to cover three years. This called for the rebuilding of 4,650

box cars at the rate of 1,550 per year; heavy repairs to 829 other freight cars, and the scrapping or sale of 537 light freight cars of about an average of 20 tons capacity (the total number of box cars in service was about 9,700). This work, which was begun well along in 1916, had up to December 31 progressed remarkably well. Six hundred and sixteen box cars had been almost completely rebuilt and heavy repairs had been made to 343 cars and 71 cars of the light equipment had been scrapped. At the present writing, inquiry develops that, at the close of July, 1917, 1,952 box cars have been rebuilt; heavy repairs have been made to the 829 cars, at an actual cash outlay for labor and new material of \$760,000, all of which has been appropriated from current earnings; and 223 cars of the light equipment have been sold, or dismantled and written out of equipment account. It will thus be seen that their operations, under this general and comprehensive plan of rehabilitation of freight-car equipment, are considerably ahead of the schedule, and will probably be wholly completed and out of the way prior to December 31, 1918, instead of June 30, 1919, as originally contemplated. The company has ordered since the close of the year 125 steel underframe 40-ton box cars to replace 50-ton wooden cars under equipment trusts which have been destroyed. From now on cars will be built at the company's own shops to immediately replace cars destroyed under equipment trusts.

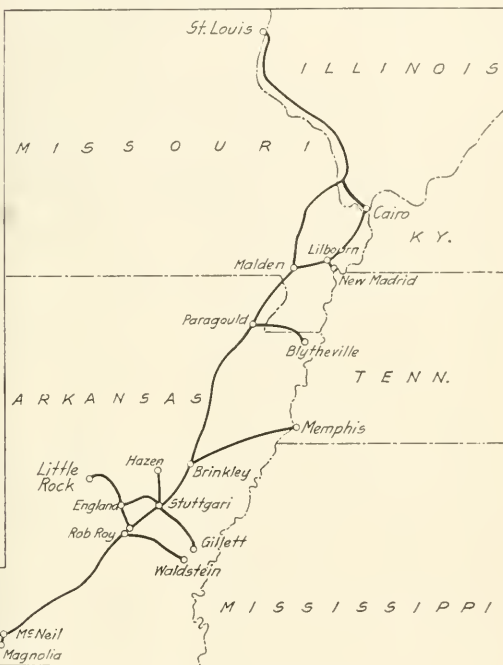
The locomotive situation was not as serious as the car situation, but since the close of the year eight 10-wheel passenger locomotives and 12 Consolidation freight locomotives were bought through the sale of equipment trusts.

Not only was the company's equipment in bad shape, however, but the difficulties of operation were greatly increased by the fact that the St. Louis Southwestern being an originating road felt the car shortage particularly severely. For a period of many months the company did not have on its own lines a supply of cars equal to more than 50 per cent of its ownership of cars.



business handled under conditions which were quite abnormal.

As throwing light on the prospects for the present year it is significant that although there was an actual large increase in freight business moved, much additional business was offered which could not be handled and which will presumably move in 1917. Much of the 1916 crop of cotton was withheld until after December 31. The rice crop of Arkansas was the largest in the history of the state, but a



The St. Louis Southwestern

very considerable part of this crop was not moved because of the car shortage, and lumber, which forms an important part of the traffic of the St. Louis Southwestern, while showing a largely increased tonnage moved partly because of better carloading, did not move in by any means the volume that it would have had more cars been available.

During the six months ended December 31, 1916, freight revenue amounted to \$5,839,000, an increase of \$1,187,000, or 25.51 per cent. To have moved the large increase in freight business which this increase in revenue represents is no small feat in itself. The increase in revenue was apparently* greater than the increase in ton mileage, due to the fact that the average ton-mile rate was higher, but not withstanding this there was a very large increase in actual freight

Transportation expenses (the out-of-pocket cost of moving the business) amounted to \$2,105,000, an increase of \$287,000, or 15.81 per cent, over the previous year. The average carload of freight in the last six months of 1916 was 18.30 tons, comparing with 17.95 tons in the fiscal year ended June 30, 1916, and 17.55 tons in the fiscal year ended June 30, 1915. The average trainload, including company freight, was 394 tons in the six months ended December 31, 1916, comparing with 386 tons in the fiscal year ended June 30, 1916, and 345 tons in the fiscal year ended June 30, 1915. Better carloading and better trainloading were the methods used in holding down transportation expenses so successfully in the face of the very adverse operating conditions above described. It is quite safe to say that the better trainloading was largely due to a renewal of enthusiasm on the part of officers and employees brought about by more direct and personal supervision on the part of the new vice-president in charge of the property.

The improvement in the financial condition of the com-

*Traffic statistics are not given in the company's annual report for the calendar years 1916 and 1915, comparisons being made only for the six months ended December 31, 1916, and the corresponding six months of 1915. The average ton-mile rate in the 1916 six months was 1.15 cents, and in the 1915 six months, 1.05. The increase in the 1916 six months over the corresponding period of the previous year in tons of freight carried one mile was 14.75 per cent.

pany is striking. At the end of the June 30, 1916, fiscal year there were \$785,000 loans and bills payable; at the end of the calendar year 1916 this entire amount has been paid off. Cash on hand had been increased by \$679,000, bringing the total up to \$1,299,000, and special deposits had been increased by \$535,000, bringing the total up to \$979,000. The working capital of the St. Louis Southwestern would be quite ample for a 1,754-mile road doing the amount of business that this road does under ordinary circumstances, but with the program laid out for rehabilitation through surplus earnings this working capital is certainly not large enough to justify any disbursement in the way of dividends.

The St. Louis Southwestern will undoubtedly need, some time in the comparatively near future, considerable expenditures for additions and betterments. In the last six months of the calendar year 1916 there was \$142,000 spent for additions and betterments, of which \$133,000 was appropriated from the income of that six months. As soon as railroad credit improves and the full results of the present operating methods and policy toward rehabilitation have become effective the St. Louis Southwestern ought to have an ample basis on which to do necessary financing. The company has spent \$517,000 on road equipment, against which no securities have been issued; it has \$1,111,000 bonds of affiliated companies which are not pledged, and has made construction advances amounting to \$268,000, besides having loaned the Valley Terminal Railway \$261,000 and has in its treasury \$4,114,000 of its own first terminal and unified mortgage bonds. The Valley Terminal Railway mentioned above is a subsidiary company formed to build a large interchange yard near East St. Louis. In all about 14 miles of track will be laid in this yard and when completed this yard will connect the Missouri Pacific-St. Louis Southwestern joint Illinois main line and the Terminal Railroad Association of St. Louis with the Alton & Southern and the Illinois Central.

The following table shows the operating figures for the six months ended December 31, 1916, and December 31, 1915:

	1916	1915
Average mileage operated.....	1,754	1,754
Freight revenue.....	\$5,838,628	\$4,651,869
Passenger revenue.....	1,594,466	1,222,176
Total operating revenue.....	7,906,460	6,280,779
Maintenance of way and structures.....	858,986	631,281
Maintenance of equipment.....	1,360,267	1,060,046
Traffic expenses.....	269,079	242,842
Transportation expenses.....	2,104,831	1,817,421
General expenses.....	273,295	257,466
Total operating expenses.....	4,884,094	3,972,574
Taxes.....	306,613	289,877
Operating income.....	2,714,428	2,016,048

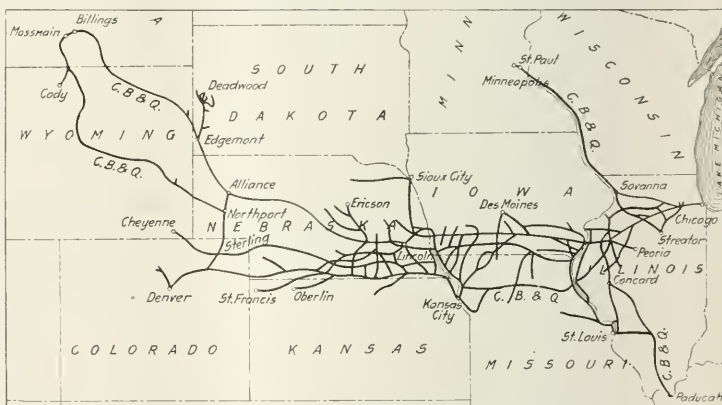
The following table shows the income account figures for the calendar year 1916 compared with the calendar year 1915:

	1916	1915
Operating revenues.....	\$13,850,130	\$11,275,024
Operating expenses.....	9,318,306	7,848,791
Taxes.....	615,814	598,793
Operating income.....	3,913,634	2,823,982
Gross income.....	5,442,631	3,951,776
Net income.....	2,222,165	736,012
Appropriated for additions and betterments.....	132,580	
Surplus.....	2,089,585	736,012

CHICAGO, BURLINGTON & QUINCY

THE Burlington has reduced its operating ratio to below 60 per cent. The ease with which this road, its management and its organization have handled a very great increase in business in the last year and a half is in striking contrast to the difficulties which the eastern trunk lines have experienced in taking care of their increased business. For one thing it illustrates graphically the contrast between a railroad plant with a large margin between business handled and capacity of facilities and a railroad plant being worked under normal conditions to within 10 or 15 per cent of its capacity. In the case of the Burlington, however, not only does the showing made in the calendar year ended December 31, 1916, give a basis for generalizations about railroad operation, but it also brings home with great force the remarkable foresight and combination of precision of judgment and imagination which has been exercised in the development of these 9,019 miles of railroad.

For the first time the Burlington earned over a hundred million dollars—\$109,191,000 in the calendar year 1916.



The Chicago, Burlington & Quincy

The average ton-mile rate was lower in 1916 than in 1915, being 7.08 mills last year and 7.21 mills the year before. The ratio of expenses to total revenues was 59.74 in 1916, as against 64.25 in 1915. The ratio of transportation expenses to total operating revenues in 1916 was 29.32; in 1915, 30.57.

After paying expenses, rentals and interest the Chicago, Burlington & Quincy had a surplus available for dividends of \$32,995,000, comparing with a surplus in 1915 of \$21,072,000. The 1916 surplus was equivalent to nearly 30 per cent on its stock. The Burlington has been for a number of years paying regular dividends of 8 per cent. During this last week the directors have declared in addition to the regular quarterly dividend an extra dividend of 10 per cent. Certainly this is amply justified by the showing made in the calendar year 1916. This extra dividend which the Burlington declared goes in equal parts to the Great Northern and the Northern Pacific, and unless an extra dividend is declared by one or both of these companies, is not in the nature of an extra cash distribution to investors.

Heavier trainloading was by far the most important item in the explanation of the Burlington's lower transportation ratio. The increased volume of traffic and the better balancing of traffic were important factors in helping the increase in trainload, but this fact detracts not at all from the credit which is due to the organization which, under

stress of an increase of 19 per cent. in the revenue freight carried and of 22.7 per cent. in ton mileage of revenue freight, held freight train mileage down to an increase of only 11.7 per cent. and freight train car mileage down to an increase of 10.8 per cent. The average revenue trainload on the Burlington in 1916 was 575 tons as against the average in 1915 of 519 tons, and the average trainload of all freight, including company, was 670 tons in 1916 and 617 tons in 1915. With a road operating 9,019 miles, of which more than half is branches and spurs, and having as large a proportion of grain and livestock as the Burlington and as small a proportion of coal—only 30 per cent. of the total tonnage even in 1916—a trainload of 670 tons is a record that the management may well be proud of.

The average number of loaded cars in freight trains, excluding mixed trains, in 1916 was 28.89, as against 27.75 in 1915, and of empty cars, 11.64 as against 13.14 the year before. The average tonnage of all freight per loaded car in 1916 was 23.94, and in 1915, 23.09. With a small proportion of coal tonnage this is remarkably good carloading.

The outstanding reasons for the Burlington's present great prosperity are its original comparatively low cost of building, its low capitalization per mile of road, the policy of keeping the road well ahead of the needs of a rapidly growing country by the expenditure of large sums from surplus earnings for additions and betterments, and the perfecting of an operating organization which, like the plant itself, has been kept far enough ahead of the requirements placed on it to be capable of meeting even an overload such as has developed in the last year and a half without breaking down under it.

When we talk about the Burlington's surplus and its great investment from earnings in additions and betterments it is essential to remember that during all these years the Burlington has been in active competition throughout its territory with other powerful railroads, and of necessity its rates have been no higher than those of other roads and its service has had to be at least equal to that of its competitors. There can be, therefore, no question of the company having charged unduly high rates to build up its great surplus. Its rates were reasonable, both as established by the test of competition and by court and state commission reviews. The huge surplus which has been put into the property represents the self denial of the owners of the stock of the company in not taking profits which under any test belong to them. The total surplus at the end of 1916 amounted to \$203,090,000 and is divided on the company's balance sheet as follows: \$40,527,000 additions to property since June 30, 1907; \$15,437,000 funded debt retired through income; \$24,080,000 sinking fund reserves; \$8,565,000 appropriated surplus not specifically invested (possibly some of this amount was drawn upon for the extra 10 per cent dividend), and \$114,481,547 profit and loss. The Burlington's cash on hand at the end of 1916 was nearly double its total current liabilities—cash amounting to \$19,848,000 and current liabilities to \$11,422,000. In addition to the cash on hand there was \$12,347,000 time deposits.

In 1916 the Burlington appropriated from income \$8,865,000, but this covered the 18 months ended December 31, 1916. The actual additional investment in road and equipment during the calendar year 1916 was \$8,616,000. The principal items of expenditure were \$1,125,000 for grading, \$1,064,000 for bridges and trestles, \$912,000 for shops and engine houses, \$417,000 for freight cars, and \$445,000 for passenger cars.

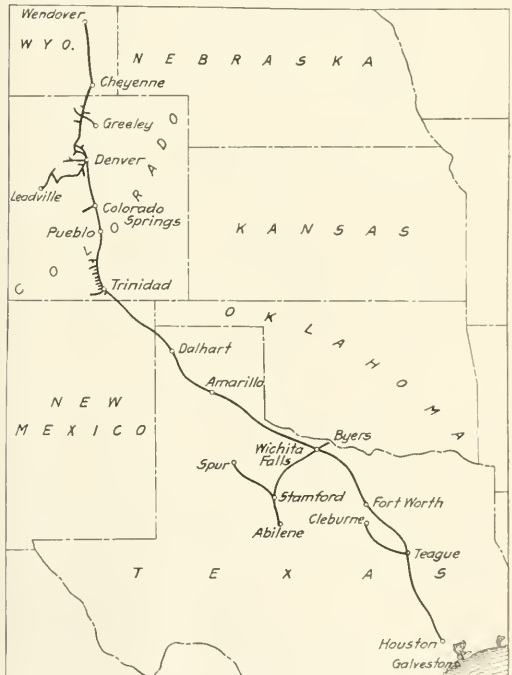
The following table shows the principal figures for operation in the calendar year 1916, compared with the calendar year 1915:

	1916	1915
Mileage operated	9,019	9,019
Freight revenue	\$77,310,516	\$64,211,845
Passenger revenue	21,833,534	20,838,622
Total operating revenues	109,191,204	93,598,722

Maintenance of way and structures	11,203,997	12,925,216
Maintenance of equipment	17,403,852	14,833,787
Traffic expenses	1,662,805	1,577,138
Transportation expenses	32,014,949	28,810,984
General expenses	2,203,308	2,033,345
Total operating expenses	65,235,705	60,127,079
Taxes	4,820,197	4,262,552
Operating income	39,098,988	29,175,934
Gross income	42,090,304	30,480,802
Net income	32,994,726	21,671,892
Sinking funds	1,864,287	1,783,800
Dividends	8,867,128	8,867,128
Additions and betterment	8,864,595	3,340,669
Fund for accrued taxes not yet due	2,400,000	.....
Miscellaneous appropriations	6,000,000	.....
Surplus to profit and loss	4,998,715	7,680,295

COLORADO & SOUTHERN

IT is interesting to note how the policies of the parent company, the Chicago, Burlington & Quincy—are being reflected in the showing made from year to year by its subsidiary, the Colorado & Southern. The Chicago, Burlington & Quincy bought the controlling interest in the Colorado & Southern in 1909. The road had been previously placed on a dividend paying basis—apparently a 4 per cent basis—for its preferred stock, of which there is \$17,000,000 out-



The Colorado & Southern

standing, but not long after the Burlington took possession, dividends were discontinued, and it was not until October, 1916, that they were resumed. In the calendar year 1916 the Colorado & Southern had available for dividends \$3,011,000, and payments for the year, representing a 2 per cent dividend on the preferred payable October 10, 1916, amounted to \$170,000.

The Colorado & Southern is one of those lines which may have to profit by traffic developed via the Panama Canal, but in 1916 practically none of this traffic was developed, and the very favorable showing made by the Colorado &

Southern as compared with its showing in 1915 was due entirely to the general prosperity of the territory served and increase in coal consumption and shipments of agricultural products. In 1916 the total ton mileage of revenue freight was 1,221,500,000, an increase as compared with 1915 of 143,800,000 ton-miles. Total freight revenue amounted to \$11,951,000, an increase of \$1,390,000 over 1915, and passenger revenue amounted to \$3,523,000, an increase of \$262,000 over the previous year.

The Colorado & Southern is a single track road connecting Colorado with the Gulf, using the Trinity & Brazos Valley as an outlet to Houston, Tex. With freight revenue in 1916 of \$6,489 per mile and passenger train revenue, including express, mail, etc., of \$2,174 per mile, the average ton-mile rate was 9.78 mills, a decrease of 0.02 mills as compared with 1915, and the revenue per passenger-mile was 2.626 cents in 1916, an increase of 0.057 cents.

Of the total tonnage amounting in 1916 to 7,873,000, 62.44 per cent originated on the Colorado & Southern lines and \$7.56 per cent was received from connecting carriers. Of the total tonnage, 55.78 per cent was products of mines, 19.16 per cent products of agriculture and 11.40 per cent manufactures. L. C. L., although furnishing only 2.85 per cent of the total tonnage, furnishes 11.39 per cent of the total freight revenue, and fruits and vegetables, which are included in the tonnage of products of agriculture and which represent only 1.62 per cent of the tonnage of all freight, furnished 4.65 per cent of the total freight revenue.

In 1916 the Colorado & Southern brought its operating ratio down from 68.30 to 61.24. Total operating expenses amounted to \$10,085,000 in 1916 as against a total of \$10,071,000 in 1915. Transportation expenses show up particularly well. These expenses amounted to \$4,611,000 in 1916, with 1,221,500,000 ton-miles of revenue freight carried and 134,150,000 passenger-miles handled, and in 1915 to \$4,604,000, with 1,077,800,000 ton-miles of revenue freight and 126,900,000 passenger-miles. Notwithstanding the larger freight business handled, total freight train mileage amounted to 2,856,000 in 1916 as against 2,914,000 in 1915. Passenger train mileage increased slightly, being 2,437,000 in 1916 and 2,404,000 in 1915.

Maintenance of way expenses were held down probably because of the difficulty of getting material and men. They amounted in 1916 to \$1,882,000 as against \$1,944,000 in 1915. The two principal items in which there was a saving were ties, with \$442,000 spent in 1916 and \$494,000 in 1915, and track laying and surfacing, with \$537,000 spent in 1916 and \$595,000 spent in 1915.

Maintenance of equipment costs increased only very slightly, amounting in 1916 to \$2,821,000, and in 1915 to \$2,769,000. The decrease in the cost of repairs of freight cars is little more than offset by an increase in the amount charged for depreciation of freight cars, and there were also small increases in the amounts charged for depreciation of passenger cars and of locomotives.

Burlington policies are in evidence in the 1916 balance sheet of the Colorado & Southern. Cash on hand amounted at the end of the year to \$2,682,000, and time drafts and deposits to \$2,970,000. There were no loans and bills payable, and total current liabilities amounted only to \$2,489,000. There was to the credit of profit and loss June 30, 1908, just prior to the purchase of the Colorado & Southern by the Burlington \$6,539,000. At the end of 1916 there was a total corporate surplus of \$13,652,000, and in the intervening years considerable amounts had been written off through profit and loss.

The following table shows the principal figures for operation in the calendar year 1916 compared with the calendar year 1915:

	1916	1915
Average mileage operated	1,842	1,829
Freight revenue	\$11,951,001	\$10,560,926
Passenger revenue	3,522,955	3,260,469

Total operating revenues	16,469,279	14,746,663
Maintenance of way and structures	1,881,738	1,944,311
Maintenance of equipment	2,821,367	2,769,214
Traffic expenses	213,672	202,160
Transportation expenses	4,611,103	4,604,377
General expenses	479,700	475,085
Total operating expenses	10,085,332	10,071,277
Taxes	737,611	666,184
Operating income	5,625,619	4,007,906
Gross income	6,347,780	4,575,976
Net income	3,011,227	1,108,150
Sinking funds	67,432	68,301
Dividends	170,000	.....
Additions and betterments	280,220	.....
Miscellaneous appropriations	500,000	.....
Surplus	1,992,575	1,039,848

BROOKLYN RAPID TRANSIT

THE Brooklyn Rapid Transit earned its 6 per cent dividend in the fiscal year ended June 30, 1917, with only a comparatively small margin to spare; but, on the other hand, the company made a better showing in the second half of the year than in the first half. This is especially encouraging in view of the fact that prices of materials and labor have continued to rise, being considerably higher in the second half of the fiscal year than in the first half. There are two sources from which the Brooklyn Rapid Transit may expect to show increased gross and a corresponding increase in amount available for dividends. One is from its operation of rapid transit lines, in the earnings of which it has a prior joint interest with New York City, and the other from an operation of its surface lines.

The one hope of increased net available for dividends from the surface lines is that the New York Public Service Commission and public opinion generally will recognize the necessity for the maintenance of the credit of the company and grant its requests for a small charge for transfers. The increase in cost of doing business on the surface lines is, in-so-far as it affects materials, probably not permanent, but in-so-far as it affects labor—and a large part of the increase in the cost of operation of the surface lines was in increased wages—it will in all likelihood be permanent.

The transfer privilege in large cities is very much abused, and especially is this so in Brooklyn and in New York. The Brooklyn Rapid Transit in 1913 received an average of 3.41 cents per passenger per ride. This has been steadily decreasing, until in 1917 it was only 3.26 cents. While there may be a great deal of force in the argument that a nickel fare has been established so long and is so much more convenient than a six-cent fare that it will be almost impossible to get municipal governments and public service commissions to agree to change from this fare, these arguments do not apply to a charge for transfers. A charge is now made in New York for a transfer from the subway to surface lines and there is no complaint of inconvenience. The unscrupulous man or woman who gets a transfer, does a morning's shopping and then uses the transfer is getting a service which amounts to discrimination against the more scrupulous passenger who pays a second fare in accordance with the provisions on the face of the transfer.

As will be shown later, there is no prospect of an immediate increase in net revenue to the Brooklyn Rapid Transit from the operation of its rapid transit lines in partnership with the city, although in years to come the operation of this part of the system may prove very profitable. The company, however, needs a greater margin of safety above dividend requirements and needs it immediately.

The company spent for additions and improvements to its surface lines, exclusive of any construction expenditures under contract made with the city, \$1,249,000. As far as the balance sheet is concerned this expenditure was in part offset by a credit of \$957,000 for properties displaced, the largest single item being a credit for power plants abandoned or sold. The company spent on capital account, therefore, in

1917 about \$1,225,000, part of which should have been and was supplied from surplus and the rest will have to be, some time in the future supplied from the sale of securities. The company is now carrying a floating debt of \$4,450,000 secured by refunding bonds. It is obvious that this debt ought to be funded in the near future.

The people of Brooklyn are vitally interested in the proper maintenance and expansion of the Brooklyn Rapid Transit. The company in recent years has given indisputable evidences of good faith in its efforts to build up an organization which will give good service to its patrons. Good service on a city railway depends primarily on two things: type of equipment and caliber of conductors and trainmen. The Brooklyn Rapid Transit is adopting, as near as can be judged, modern types of equipment just as rapidly as its financial condition will permit. Operating conditions in Brooklyn are such as to preclude certain types of equipment that smaller and less congested cities are using.

A motorman or conductor's job, especially in winter, is a hard one. If low wages are paid and poor conditions of work are tolerated the class of men that will take such jobs are a very poor type and the average time which a man holds down his job is short. Recognizing this, the Brooklyn Rapid Transit has made special efforts to pay as fair a wage as operating revenues will permit and at the same time to create conditions which will attract a higher grade of men than would ordinarily become street railway conductors or motormen.

In commenting on the company's previous reports mention has been made of the employees' welfare work, which includes various activities in the interest of the health and social entertainment of employees and the company also provides life insurance for employees. The Brooklyn Rapid Transit spent \$133,000 on this work in 1917 and it is interesting to note that there are now 6,246 employees who are members of the group insurance plan. At Christmas the company gave its employees in the form of gratuities a little over \$29,000. The company also helped its employees to subscribe to the Liberty Loan, making it possible for them to make small monthly payments to be deducted from wages, and the total number of employees subscribing for Liberty bonds was 7,744, the amount subscribed for being \$579,000. It was, of course, necessary for the company to borrow the amount necessary to finance its employees' subscriptions and employees were allowed in some cases as much as two years to complete their payments.

In so far as the employees themselves are concerned, they showed an appreciation of what the company is doing for them by a refusal to join in with the outside agitators who created considerable trouble in Manhattan last winter. President Williams says that the sympathetic relations which have prevailed for years between men and management remained unbroken. Not only are the employees deriving benefit from this broad policy of the company, but the patrons also ought to appreciate that these efforts are of direct and vital interest to them. It is difficult enough to train even fairly high class men to give courteous, good service in surface street car work. It has been proved over and over again quite impossible to train a poor grade of men to perform this work at all efficiently. The conditions in rush hours on the Brooklyn Rapid Transit, as on other street railways in the large cities, can be bettered only through the provision of additional facilities, but conditions in non-rush hours vary directly with the efficiency of motormen and conductors. While the Brooklyn Rapid Transit has by no means reached its ideal in the training of its employees, the public and Public Service Commission both ought to recognize the farsightedness of the efforts which are being made in that direction and to co-operate with the company so as to permit the establishment of a credit which will insure adequate development of facilities and a continuation of payment of fair wages

and the provision of good working conditions for employees.

As was previously mentioned, the prospects for immediate increased net from the operation of the rapid transit lines in which the city has a partnership are not at all good. The Brooklyn Rapid Transit under the agreement made with the city in 1913 has spent \$11,149,000 toward the building of new city owned lines, \$8,373,000 for equipment of city owned lines, and \$30,459,000 for additions, extensions and improvements on existing lines; a total of \$49,981,000. The agreement with the city provides for a first preferential for the company of \$3,500,000 and a further preferential for interest on additional expenditures for equipment, new city owned lines, etc. Previous to June 30, 1917, fiscal year the earnings on the rapid transit lines had failed, after the payment of maintenance, taxes, depreciation, etc., to quite cover the total \$10,180,000 company's first preferential from August 4, 1913, to June 30, 1916. During the year ended June 30, 1917, however, earnings provided for the payment of \$3,500,000 first preferential due in that year in full, with a net of \$858,000 over. The amount due on the second preferential was \$1,109,000, so that there was a deficit of approximately \$250,000 in the company's preferential. This deficit is cumulative and the total amount now owing to the company out of future net earnings is \$1,037,000. As new lines are put into operation there is a very good prospect that the company will be able not only to earn its first and second preferentials but to earn enough to take up this deficit; but after the deficit has been taken up no further profits will accrue to the company except its preferentials until the interest paid by the city on its cost of construction is earned in full.

The city's deficit in the year ended June 30, 1917, was \$2,239,000, and presumably it will be some little time before net earnings are sufficient to pay both the company's preferentials and the city's interest charges. What the company needs, therefore, is to have the Public Service Commission grant it sufficiently increased revenues on the surface lines to strengthen its credit and make safe its dividend during the period which must elapse before a larger profit is earned on the new rapid transit lines.

The following table shows something of the magnitude of the business done by the Brooklyn Rapid Transit:

Fiscal Year Ended June 30, 1917.	
Total miles of first track of surface lines.....	129
Total miles of second track of surface lines.....	124
Miles of first track of surface lines leased.....	116
Miles of second track of surface lines leased.....	111
Total miles (all double track) of rapid transit lines.....	57
Grand total miles of all tracks (surface and rapid transit) leased and owned.....	743
Passenger earnings, surface lines.....	\$17,154,827
Passenger earnings, rapid transit lines.....	11,331,000
Total earnings, including mail and freight.....	29,931,833
Operating charges and betterments.....	16,741,417
Taxes.....	2,351,104
Interest and rentals.....	5,644,074
Net available for dividends.....	5,195,238
Dividends.....	4,467,318
Surplus (after deducting other appropriations).....	382,016
Passengers carried.....	760,519,397

NEW BOOKS

Eight-Hour Law Time-Mileage Computing Table. Copyright by C. F. Needham. Published by Fred. E. Murray, Battle Creek, Mich. Printed on celluloid card, in two colors. Vest pocket size 2½ in. by 3½ in., price 50 cents; and office size 4¾ in. by 7½ in., price \$1.

This table is designed for the purpose of reading at a glance the number of miles corresponding to any given period of time, in hours and minutes, from 1 minute to 24 hours; and conversely the time, in hours and minutes, corresponding to any given number of miles from 1 to 300 miles, at 12½ miles per hour. The small size is convenient for men in engine and train service; while the large size is for the use of timekeepers and others, or for posting on terminal bulletin boards.

How Railway Efficiency Helps Win the War.

Why Better Use of Existing Facilities May Save the
Lives of Hundreds of Thousands of Young Americans

By Daniel Willard

President, Baltimore & Ohio, Chairman Advisory Commission on National Defense.

ON the 6th of last April this country, by formal action of Congress, became a participant in the greatest war that has ever occurred in the history of mankind. Before the United States entered the war we were told on good authority that there were at that time 37,000,000 men in uniform and under arms on the various battlefields of Europe—not in the first line, it is true, but either at the front or in reserve—37,000,000 men in uniform and under arms before the United States went in! Estimates have been made which would indicate that at the present time the cost of this war to the total participants is approximately \$100,000,000 a day in money and 15,000 men in lives lost—not crippled or wounded, but lives actually lost every twenty-four hours. But terrible as that is, it is only a mild statement of the case. It is just the slightest possible measure of what is being done. That statement takes no note of property destroyed, of those crippled for life, of minds shattered, of eyesight lost.

The United States for a long time, longer than some thought should have been the case, kept out of the war. I tried, with many others, to be neutral. I had been in Germany many times. I had great admiration for the German people. I have a great admiration for the German people today. But developments took place, things happened (all of which were laid before you by the President in his various admirable messages, and all may know, if they desire to know, why it is that we are at war), and the day when our Congress decided that we should enter the war, no matter what might have been my previous views, that day I ceased to be a neutral. I am not a Democrat. I did not vote for President Wilson; but this is not a matter of politics, it is a question of national existence; and today a man can occupy only one of two possible positions on that question; he is either for his country or he is against it. There is no other possible choice.

One of the first problems requiring serious consideration after the declaration of war was the matter of transportation, and I feel that it is a great credit to the railroads of this country that in just five days after the Congress had declared war, men representing the 175 principal independent railroad companies in the United States assembled in Washington, and, after listening to a presentation of the situation, they voted unanimously then and there, and signed papers confirming their action before they left the city, giving to a small committee of five men, selected by these railroad representatives, full power to control the operation of all the railroads in the United States during the period of the war in order that the railroads might thereby be in a position to respond immediately and as a unit to any demand made upon them by the President in the interest of the general situation.

Nothing of the kind was ever done before by any industry, so far as I know, in this or any other country, and the railroads were the first to do it—and remember, only five days after war was declared. We went from a system of 175 separate and independent companies competing with each other into one nationalized system under the control of five of the ablest railway men in the country. Why? In order that we might best serve our country and so best help to win

the war. That is why it was done. No other reason in the world would have induced those executives to turn over their properties to be run as five men might dictate.

The committee of five men are sitting constantly in Washington, in effect with a map of the United States before them, on which is a railroad system 265,000 miles in length, with all ownership names wiped out. They are no longer thinking in terms of C. B. & Q., North Western, Pennsylvania, or anything of that kind. They realize that they are faced with the problem of seeing that the necessary transportation service of the United States is performed. They find, for instance, that unless unusual efforts are made to move coal to the Northwest there is likely to be a coal famine there next Winter, and, so far as they are able to prevent it, there will be no coal famine in the Northwest next Winter. Early in the Spring it became apparent that this nation would be expected to furnish much of the food stuffs required by our Allies, and with that in mind the Secretary of Agriculture urged the farmers all over the country to enlarge their crop areas as much as possible. In response to that request it is estimated that the amount of tilled land, the acreage plowed up this year, is at least 30 per cent greater than it was a year ago.

Now, in order that the program might be a success, that we might have more crops, that this additional tilled land might be productive, it was necessary to move quickly and in the Spring, not at some other time, the things necessary to increase the crop growth, such as seeds, fertilizers and agricultural machinery. That was one problem, I repeat, and the railroads met it, and I have heard no complaint from the Secretary of Agriculture or from any other source that the crop acreage or condition has been restricted or impaired in the slightest degree by the failure of the railroads to furnish proper transportation.

The importance of the railroads in a time of war is constantly illustrated. Marshal Joffre, when he was in Washington a short time ago, said something like this, as near as I can recall:—"The Battle of the Marne was won by the railroads. Without the railroads it would never have been possible to bring up the supplies, to provide the armies with the munitions, and all the things necessary to carry on the battle. The railroads won the Battle of the Marne." That was the statement made by the Hero of the Marne, one of the greatest soldiers of the present day.

RAILWAY SITUATION IN RUSSIA

Professor Lomonosoff, a high official of the Russian transportation system, is in this country now. A few days ago he also made the statement that unless they can have improved transportation facilities in Russia, it will be impossible for them to vigorously carry on the war. I am going to take time to tell you briefly just what he said about the railroad situation in Russia.

He pointed out for instance, that Petrograd—which is, we will say, the Pittsburgh of Russia—had formerly obtained its coal supply from England. Of course, they use a great deal of wood also in Russia, but at the same time they require a great deal of coal. Owing to the conditions on the ocean, the menace of the submarine and the shortage of boats, Petrograd is unable longer to get coal by ships via Archangel, on the North Sea, as was formerly the case; the same condition obtains at Moscow. Other interests are also af-

* From an address delivered to the officers of the Baltimore & Ohio at Deer Park, Md., June 29, 1917.

fectured by the reduced coal supply from the North. Russia is not so richly favored by Nature with coal deposits as is the United States, and the only deposit of any considerable size is in Southern Russia near the Caucasus, 1,400 miles from Petrograd. They are now obliged, because of that situation, to haul roundly 1,500 cars of coal north from the Caucasus each day, several times more than they had to haul in times of peace. That, in itself, was a pretty big transportation problem in a country so sparsely provided with railroads as Russia.

Furthermore, the blocking of the Archangel route virtually made Vladivostok the front door of Russia, and where formerly equipment and other things much needed came in by a much shorter haul, now those same materials, if they get there at all, must come via Vladivostok and be hauled by rail 6,000 miles before they reach Petrograd. Some of that railroad—considerable of it, in fact—is single track. I want you to know this because you gentlemen have got to play an important part in the winning of this war. I hope



From the St. Louis Globe-Democrat

Russia: Well, Now You Know What I Need

I will succeed in making that clear to everyone of you. I have no doubt that you have appreciated it from the first, but it will do no harm to repeat, that every man in this room has got to *help win this war*. Today Russia wants 2,500 locomotives just as soon as they can be obtained and 40,000 cars. Why should we be interested in that? For this reason, for this very, very good reason. It is estimated that the Germans have some two and a half millions of their troops on the Eastern front. If Russia should be forced to make a separate peace with Germany, and she might be compelled to do so—not because of the change of government, because it is believed that that change has helped the situation—but suppose Russia should be unable to get supplies, to get food, to get ammunition, to get guns, and all the other things necessary for her army—she might have to quit whether she wanted to or not, and if Russia should make a separate peace with Germany those two and one-half million Germans that are now facing the Russian Army would be released and would be moved to the western front facing France and England, and that is the exact number, I suppose, of additional men which we would have to send over to oppose

them. In other words, it may mean two million more of our young men to France if Russia is unable to meet her transportation problem satisfactorily.

It is because of the seriousness of that situation that it was felt, as soon as we got into the war, that one of the most important things to do was to find what, if anything, we ought to do to help in that connection. Fortunately, Major Washburn, who had been in Russia all during the war as correspondent for the London Times, happened to be in this country and he appeared before the Council of National Defense and explained the situation—told how important it was that Russia's railroad facilities be quickly improved so that she could carry on her operations. It was immediately decided to send a small committee of our best railroad men to Russia to find out what the situation was, and how we could be of assistance.

It took some three or four weeks to arrange the preliminaries for sending such a committee, because things were just then somewhat disturbed in Russia. A country cannot throw off an old government and take on a new one quite as easily as you can change your coat. It is a very serious undertaking, and we ought all to be glad that so far it has been carried on with such success that it promises to go through to a satisfactory conclusion. However, the committee was appointed, and comprises five of the best men who could be sent on a mission of that kind. John F. Stevens, chief engineer of the Panama Canal in its early stages, was made chairman of the Commission.

The Canadian Pacific Railroad, at our request, held the "Empress of Asia," one of their largest steamships, four days at Vancouver for the committee—they being unable to reach there sooner. They were met with a special train at Vladivostok, and taken through to Petrograd. The burden of all letters and cables that we get from them is "send cars and engines without limit; we must have cars and engines quickly, and we must also arrange to erect the cars and engines ourselves." Heretofore, because of there being no shops at Vladivostok, the engines have been hauled 400 miles to Harbin to be set up in the shops at that place. They have now asked us to erect them at Vladivostok, and that also we are going to do.

"BE CAREFUL OF YOUR POWER"

Now, why do I mention all this? For this reason: the combined output of the locomotive shops in this country is about 5,500 a year. Russia wants a thousand engines before the first of January, and at least 2,000 next year. England and France require from 1,000 up to as many as we can give each year. But suppose we give Russia 1,500 next year and England and France 1,000? That is nearly one-half of the average total locomotive output of this country. We also need more power on our railroads, but shall we sit down and hold on to everything we have and see Russia forced to a separate peace? Shall we, in order to make our own task somewhat easier, to meet a situation that is undoubtedly pressing here, hold on to all the new engines we can build, facing the possibility that because of such action we may have to send 2,000,000 more of our young men to the battle line? Or shall we say to the builders, "You send the engines that Russia wants, you send the engines that France and England want, and we by additional effort will undertake to carry the greatly increased burden put upon us, with what we already have"; that is why I ask you to be more careful of your power, to keep it in better shape, to get more out of it, to try constantly to do more with what you have. Not because we do not want to spend money, although that is a good reason, but because we want to send every available car and engine to our Allies so that on that account we will be called on to send fewer of our young men. I want you to think of that seriously. The railroad committee in Washington, which sits there constantly, is en-

deavoring to deal with the situation in such a way as to contribute most toward the winning of the war.

THE RAILROADS' PROBLEM

The railroads will not be able, no matter how hard they try, to carry all the freight that will be thrown upon them during the war, and this is why: They were measurably well equipped to perform the service of the country before the war began. As a matter of fact, for a period of some seven or eight years there was nearly always a surplus of anywhere from 50,000 to 350,000 freight cars. It cannot be said that the railroads were not fairly equipped to do the work required of them when the war began. Since then, and particularly within the last six months, we have done what I have already pointed out toward increasing the crop average. Our shops and factories were working feverishly day and night before we entered the war, making munitions for our Allies. Since then this government has appropriated two billions of dollars for the necessary supplies for its own army, superimposed on what we were already undertaking to do.

In addition to that, many boats on the Lakes which formerly carried a large volume of business east and west have been taken off, sent down through the Welland Canal and are now in Trans-Atlantic service. The boats that formerly ran up and down the Pacific Coast, carrying coal from Vancouver to southern points, have been taken off to be used as mine-sweepers, patrols and in transport service for the Navy. In the east a considerable number of boats that formerly were in our Atlantic coastwise service have been taken off. The business they formerly carried is now being done by the railroads. Not only have boats been taken off, but insurance rates on the water are so high, because of the submarine menace, that much of the business that might go by boats is now going by the railroads, and still further, the boats that formerly ran through the Panama Canal are now in other service. All that puts additional work upon the railroads, and that they have responded to the situation as well as they have I think is a great credit to everyone engaged in the railroad calling. Now, for the reasons given, the railroads will not be able to carry all the freight that may be offered. That is one of the things that I wish you gentlemen to understand, so that you will be able to help the public understand—that part of the public with which you come in contact.

The railroads will probably be able to carry all of the food stuffs necessary. They will carry the necessary coal and munitions, and they will carry the steel to make ships, *all of the things necessary from the standpoint of winning the war*, and this will not exhaust their capacity. But let us say that it will take 75 per cent of their capacity to perform service of the kind mentioned, leaving 25 per cent of the capacity for the ordinary business of the country. Probably the ordinary business of the country at the present time requires double that capacity, so that part of it cannot be carried, and we must exercise a judicious discrimination. Congress has been asked to pass a so-called priority bill, establishing a small committee of men who will decide questions of that kind—questions of priority of movement. Because of the fact that all things cannot go at the same time, they will endeavor to determine which particular thing ought to go first, from the standpoint of national defense.

There has been, for instance, much complaint from the road and structural builders in Ohio, because the railroads could not handle the sand, gravel and other things necessary in carrying on their work. They appealed to their members in Congress and it looked as if the situation would become serious. However, a small committee of representative men came to Washington, at the suggestion of Senator Pomerene, and the situation was explained to them as clearly as it could be. It was pointed out that we were at war—we were not at peace—that it was idle to say that things would or could go

on as usual while we are at war—idle—worse than that, criminal—because it was misleading, and any serious effort in that direction would tend to prolong the war rather than to shorten it. That was pointed out to them, and it was suggested that they go over the situation and find out what particular things were of most importance and then come back and tell us what they wanted. It was suggested, for instance, that if some among them were using sand at points located on the Pennsylvania, that they should also buy it on the Pennsylvania and not on the Baltimore & Ohio, and *vice versa*, so that the delay due to the transfer of cars between railroads could be cut out. They were delighted to have these and other suggestions. It was pointed out to them that the railroads had not broken down, as is sometimes said,—that never in their history were the railroads carrying as much business as today, but that we must carry those things first that are essential to the *winning of the war*; they said—“Of course, we understand it now; we will go back and co-operate with the local railroad officers and we will certainly try to make lighter your burden and to defer for the present those things that can be deferred without serious detriment.”

I mention that as an illustration; I know of many instances of the same kind. Now you men who come in contact with the public must explain the situation to them, you must say to them that there is *nothing* in this world so important to you, or to them, or to anyone interested in this country as the *winning of the war*. This is the only test we have: “*Will the thing under consideration help win the war?*” If so, it has our support; if not, so long as the war continues, we are not interested in it. I hope you men, because of what I say, will have a little better understanding of the situation when you leave here than have many who are living in the interior, and it is your duty, and your privilege, too, to tell them what the situation is as you understand it, so that they can co-operate and help in what we are all trying to do. My own experience makes me believe that they will accept your suggestions and you will find cooperation instead of complaint.

THE RAILROADS' WAR BOARD*

By Edgar E. Clark

Member Interstate Commerce Commission.

I am glad to take advantage of the opportunity of saying that I personally, and, through me, the other members of the Commission, have had, and still have, entire sympathy with the work of this Committee and with the principles upon which it is founded. We recognize the full effect of, and the principle that lies underneath, the response of the railroads of this country to the needs of the hour as presented to them by the Federal Government.

I think there is a weakness in the average American character in expecting to see the next day after a new plan is formulated, direct, immediate and visible results. And so when a movement of this kind is undertaken you find on the streets and in the newspapers the next morning criticisms that the machinery has been created or provided, but it has not been productive of any good results yet. A movement of this kind if it is to be successful must be undertaken, as this has been undertaken, by laying a foundation.

We have watched with a good deal of care at the Interstate Commerce Commission the results from day to day and from week to week and I can say without qualification or hesitation, in fact, I am glad to say, that within the past few weeks it has been apparent, both on the face of the returns and in the marked falling off of complaints that come to us,

* Remarks made at a conference of the Special Committee on National Defense of the American Railway Association, Washington, D. C., July 11, 1917. Mr. Clark, representing the Interstate Commerce Commission, sits with the Railroad War Board.

that the efforts of the railroads through this Committee are resulting in great good. A great deal has been done to relieve what was and still is a very serious situation.

We realize that this situation, the congestion on the railroads, the abnormal demand for transportation, came almost out of a clear sky. We realize, as the average person does not realize, that the demands for transportation probably exceed the possibilities even if the maximum of efficiency be worked out. It follows that somebody may have to go without transportation he desires to have.

The Committee and the railroads must get along as best they can, not only under the thoughtless criticism of those who do not take time to study the situation and think it over, but they must meet unfair criticism from people who are trying to direct attention to alleged faults of others in order to avoid having their own shortcomings and evil doings brought into the limelight. There are those, and they are heard through the newspapers and otherwise, who in my opinion are pursuing a studied course to make it appear that the shortcomings of the railroads are much worse than in fact they are, because they do not want the shortcomings of those whom they represent to become known or prominent. So I think it is due to yourselves that the facts should be known. Facts will speak for themselves among the thinking people of the country and the more of the facts that can be put out, the better in my judgment it will be for all concerned.

The principal thing that is complained of by most people is what is commonly called "car shortage." Congress has recently put upon the Interstate Commerce Commission the responsibility in a large measure for movement, distribution, interchange and exchange of cars. That legislation is responsive to a recommendation in the Commission's annual report submitted to Congress in December last at a time when it was difficult to find enough clerks to open the telegrams and letters received, complaining about these things. At that time there was no concerted or unified effort on the part of the railroads to deal with the situation and no apparent evidence of any such intention. The Commission felt that the situation would not grow better as long as the war continued unless there was some centralized general plan for dealing with the situation. If the plan that was later adopted and under which this Committee was created had been in existence at that time that recommendation would probably not have been made. But now that law comes into existence at a time when the railroads themselves are, in my judgment, dealing with this situation in a comprehensive, patriotic, able and fair manner.

It would be most unfortunate if because that law has cast upon the Commission the powers and duties which it does cast upon us, the railroads' officers should feel discouraged in their efforts, and I can say authoritatively that it is not the desire of the Commission that they should so feel, because in so far as our duties reach we hope to work the problems out in cordial cooperation with this Committee. We do not want to interfere with any well laid, well conceived plan that this Committee has formed. We are organizing to perform those duties with those purposes definitely in mind. We wish to establish the best possible means of contact with the Car Service Commission and to have thorough understandings with them. We will have no secrets from them and will consult freely with them on important matters.

It is not perhaps entirely unfortunate that this law was passed, because in any large movement for progress or reform we run against the recalcitrant that will not willingly get into line. So if it becomes necessary in dealing with recalcitrants or insurgents the Commission will have the power to require proper action and will not hesitate so to act. There are many good things in connection with transportation in times of peace and when there is plenty of

transportation and plenty of transportation facilities that seem consistent and proper which in times like these are troublesome and expensive and in a large measure perhaps ought to be modified or eliminated.

The question of reconsignment has been referred to. We are not insensible to the facts that under the rules that have been voluntarily established by the railroads there are many abuses of equipment, and that the carriers are put to the performance of expensive services without due and proper compensation therefor. I have no special authority to speak for the Commission, but I can speak for myself and I believe I speak the sense of the Commission in saying that in so far as our authority is necessary to that end, we are willing to exercise it in moderation in the direction of correcting evils, but we do not think that the right way to cure them is to immediately or at one stroke wipe out all such provisions and practices. There are situations in this country where reconsignment is essential to proper distribution of commodities, and, in many ways, is essential to the interests of the carriers. I have in mind the situation in regard to fuel coal at Detroit, where much trouble has been felt. The industries have grown in the last few years with marvelous rapidity and practically none of them is equipped with facilities for storing a supply of coal which would permit it to operate a month. If these industries are required to order their coal from a given mine consigned direct to their plants it follows that that coal must come with regularity day by day or the plant will find itself out of coal. And so there has grown up at Detroit a system under which the industries depend upon coal dealers who keep a supply coming from the mines all the time, but when it comes from the mines they have no idea who is going to use it. It comes to Detroit and is reconsigned under tariff provisions to the ones who need it, and in that way the city is supplied. We justified in the first instance the establishment of a reconsigning charge of so much per car for reconsignment, a service which the railroads had been performing free. It developed that most of this coal was moving through the Toledo Gateway and the railroads adopted the plan of giving a passing notice at Toledo so that they might get the reconsigning orders before the coal reached Detroit. However, as the congestion was relieved the coal reached Detroit before the reconsignments could be given and recently they have come to the Commission asking reparation in certain instances in which they paid the \$2 reconsigning charge. We said it was a proper charge, that the conditions justified it and that the railroads should not be required to pay it back. I simply recite that as an instance. The point I want to make is that the Commission is not against changing these things in moderation. It is not averse to going step by step, and by long steps in some instances, in the direction of appropriate rules and proper conditions. We do not want to do things too precipitately, and perhaps do as much harm as good.

The thoughts I want to bring to you are of encouragement in this effort, of appreciation of the response, patriotically made by the railroads to the demand upon them, and to convey, if I can, an understanding of them. The Interstate Commerce Commission may not agree in full with all that the railroads would like to have. You differ among yourselves about some things and it naturally follows that others will differ with you. It is impossible for a large number of intelligent men to think alike on all subjects. If they can think alike, they will act alike. We are in sympathy with your efforts, in full sympathy with the plan along which you are acting. I do not believe that the American people in general appreciate the gravity of the situation that confronts our Government. We are not in a war of a milk-white flag. We are in for a very serious and perhaps a very protracted situation and even if peace should come at an early date and hostilities should cease, there is an enormous work for

the United States Government to do to prepare itself for similar situations that may arise within the next few years. There is an enormous work for the railroads of the country to perform.

This Committee has adopted a policy, and in the exercise of our duties under the Esch Bill we are going to try to push it along and cooperate with it, to get the cooperation of shippers in increasing the carloading, decreasing the delay to cars and contributing each his little bit, which in the aggregate means an enormous amount. The figures which are contained in the reports of this Committee as to what has been accomplished along that line are very interesting and illuminating and they show great results. If somebody could write them in a readable story for the average newspaper reader it would be appreciated a good deal more than it will be by simply stating the figures.

AN OLD STONE ARCH BRIDGE

Repairs made recently on what is probably the oldest railroad bridge in service today disclosed some interesting construction details that indicated the skill and ingenuity of the

verse 12-in. brick walls resting in the arch rings. These walls are spaced 3 ft., center to center transversely, and 5 ft. longitudinally, and are covered with 12-in. granite slabs, which in turn hold the ballast under the tracks.

It was originally constructed for double track, and, although the equipment it was designed to carry undoubtedly weighed less than the present-day automobile truck, it has



The Arch

bridge masons of nearly a century ago. The structure is 297 ft. long with a central arch with an 80-ft. span and with the base of the rail 65 ft. 6 in. above the bed of the stream. It was constructed by James Lloyd in 1829, as stated on a marble stone set in the parapet wall, and it has, therefore, been in service for 88 years. It is of native granite cut to a true surface and set in lime mortar. Large pilasters were placed at the side walls and extend to about 4 ft. above the original elevation of the railroad tracks to form parapets. The spandrel spaces over the arches are not filled, but the track load is supported on a system of longitudinal and trans-



A Close View of the Abutment

remained in perfect condition under the continually increasing loads, until it is now carrying as heavy loads and traffic as any bridge in the country. No repairs would have been necessary at the present time had not the common practice of raising the track at intervals when applying new ballast brought the rails up to the level of the top of the parapet walls and placed a heavy lateral thrust upon them which they were not designed to carry. This has caused the spandrel walls to move to such an extent that it has been necessary to take them down to the elevation of the top of the arch, and in some places still lower, and to reset them, backing them up with concrete under the track a sufficient distance to take the thrust from the parapet walls. In handling this work special care was taken to replace the stones in their former position in order to preserve the originality of the old bridge as far as possible.

The structure was in serious danger of destruction during the Civil War, but by careful guarding it came through unharmed, and, judging from its present condition, it will continue to serve indefinitely. We are indebted for this information to S. C. Tanner, master carpenter on the Baltimore division of the Baltimore & Ohio, under whose direction repairs and alterations were made.

Constructive Suggestions on Car Interchange

Prize Winning and Three Other Papers Received in the Contest on This Subject. Ideas for Present Problems

TWENTY-THREE papers were received in the contest on car interchange which was undertaken by the *Railway Age Gazette* at the suggestion of a well-known railway man who has long been a student of this complicated problem. After the close of the contest on June 10, the papers were turned over to A. M. Schoyer, resident vice-president of the Pennsylvania Lines at Chicago, N. D. Ballantine, assistant to the operating vice-president of the Chicago, Rock Island & Pacific and E. H. DeGroot, Jr., superintendent of transportation of the Chicago & Eastern Illinois, until his recent appointment as chief of the division of car service of the Interstate Commerce Commission, who examined them carefully and unanimously awarded the first prize to O. C. Castle, superintendent of car service, Southern Pacific Lines, Houston, Tex. The second prize was awarded to J. W. Smith, superintendent of car service, Western Maryland, Baltimore, Md., on the decision of a majority of the judges, Mr. Schoyer dissenting because of his disapproval of the suggestions for an equipment company.

Other papers were contributed by E. E. Betts, superintendent of transportation, Chicago & North Western, Chicago, Ill.; J. R. Cavanagh, superintendent of car service, Cleveland, Cincinnati, Chicago & St. Louis, Indianapolis, Ind.; A. C. Hasey, Yonkers, N. Y.; S. W. Fisher, car accountant, Ft. Dodge, Des Moines & Southern, Boone, Iowa; D. W. Brantley, car accountant, Central of Georgia, Savannah, Ga.; J. M. Brickett, chief clerk to general manager, Kansas City Southern, Kansas City, Mo.; T. D. Simmons, car distributor, Seaboard Air Line, Hamlet, N. C.; M. M. McNeel, car interchange clerk, Houston & Texas Central, Hearne, Tex.; J. E. Campbell, Munhall, Pa.; Mark H. Reasoner, Minneapolis, Minn.; R. J. Barry, superintendent, Houston & Texas Central, Austin, Texas; K. V. Conrad, Norfolk & Western, Roanoke, Va.; T. H. Meeks, chief dispatcher, Southern Pacific Lines, Lafayette, La.; Chas. Burlingame, superintendent, Wiggins Ferry Co., St. Louis, Mo.; P. J. Bergeron, chief demurrage clerk, Southern Pacific, Houston, Tex.; H. E. Sanders, car distributor, Kentwood, La.; G. W. Segrest, agent, Galveston, Harrisburg & San Antonio, Markham, Tex.; C. E. Henry, agent, Warren & Ouachita Valley, Banks, Ark.; L. F. McNeill, agent, Houston, East & West Texas, Appleby, Tex.; E. T. Brady, agent, Atchison, Topeka & Santa Fe, Sweetwater, Tex.; and M. L. Reinhardt, agent, Galveston, Harrisburg & San Antonio, El Campo, Tex.

FIRST PRIZE—A WORKABLE SET OF CAR SERVICE RULES

By O. C. Castle

Superintendent of Car Service; Southern Pacific Lines, Houston, Texas.

The writer makes no claim to originality in the rules presented below, as the principles underlying them are almost as old as the history of car interchange. These principles have been advocated by prominent transportation and car accounting officers for more than 50 years, but it seems to have required a world war to give them an opportunity for a fair trial.

The method of car handling now being undertaken by the Commission on Car Service practically ignores the right of the car owner to the control of his individual car, and, in theory at least, recognizes the justness of the principle laid down by the American Railway Association that each road is entitled to the possession of cars equal to its ownership. It seems reasonable to suppose that if car handling methods based on this principle are practicable and desir-

able at a time like the present, they would certainly be practicable and desirable under normal conditions.

I might point out that, under the terms of the contest outlined by the *Railway Age Gazette* no rules which rely on an equalization of balance by the return of the individual car to the owning road can be given consideration, for it is obvious that without an absolute balance in the flow of traffic it is mathematically impossible for an originating road to maintain 100 per cent of ownership solely by means of rules which insure the return of the individual car when released from the original load. Such a road must either receive the empty cars of other carriers to offset its loaded deliveries, or content itself with less than 100 per cent until its own cars are released and returned to it. If the "individual car" method is relied on, originating roads must provide equipment sufficient to handle their traffic through to destination, in which event they do not hope for nor desire the use of their entire ownership.

CAR SERVICE RULES

Definition

"Excess" road—A road having in its possession more freight cars of railroad ownership than the total number of such cars owned by it.

"Deficit" road—A road having in its possession fewer freight cars of railroad ownership than the total number of such cars owned by it.

Organization

(1) The territory in the United States and Canada shall be divided into zones by the American Railway Association.

(2) An interchange supervisor shall be selected for each zone, and a general interchange supervisor for the entire territory. The supervisors shall be detached from the employ of any railroad.

(3) The zone supervisors shall have jurisdiction over car interchange in their respective zones, reporting to the general supervisor, who shall report to the Commission on Car Service of the American Railway Association.

(4) The general and zone supervisors shall be empowered to require such reports from railroads as are necessary in the administration of these rules.

(5) The expenses of the general and zone organizations shall be borne by the American Railway Association, and all fines and penalties collected shall be credited to the association.

(6) A penalty and compensation fund shall be created and maintained by the American Railway Association for the purpose of clearing the amounts received and disbursed through the administration of these rules.

Operation

(7) All railroad cars shall be considered as "common cars," except as follows:

(a) Special classes of cars assigned by their owners to a defined traffic. This assignment shall be limited to coal, ore, coke, stock, tank and ventilated box cars, and assignments shall be approved in each case by the zone supervisor, subject to review by the general supervisor and the Commission on Car Service.

(b) All cars below 40 tons capacity.

(c) All cars in mechanical condition which will prevent their acceptance in interchange under the provisions of M. C. B. rules.

NOTE: Cars in classes (b) and (c) shall be confined to the rails of their owners.

(8) Any railroad having on its line less than 100 per cent of its owned equipment may make demand for partial or complete equalization; such demand shall be filed with the zone interchange supervisor, and shall specify the class and number of cars required, and the situation with respect to interchange and ownership balance.

(9) On receipt of a demand for equalization, the zone supervisor shall call upon excess roads in the zone to deliver a given number of cars of the required class to the deficit road making the demand.

(10) In the event the zone as a whole shows a deficit the zone supervisor may make demand on the general supervisor for an equalization, giving the necessary data for the lines, with further details as to the preferred gateways through which equalization may be effected.

(11) On receipt of a demand from any zone supervisor the general supervisor shall call upon other zones to deliver a given number of cars of the required class to the zone making the demand. The order shall specify the road or roads to which delivery shall be made, and the period within which the order must be complied with.

(12) In order to apportion the cars received in equalization by zones, a zone supervisor may direct deliveries by deficit roads to other deficit roads, such deliveries in no case, however, to be in excess of the receipts from roads in other zones.

(13) The per diem rate of settlement between carriers shall be fixed at an amount agreed upon to cover the actual cost of owning a freight car, based on the cost of equipment, depreciation, repairs and interest on the investment. The rate shall be in effect throughout the year, and shall be changed only when a thorough investigation develops that the items making up the rate have changed materially.

(14) The Commission on Car Service, on recommendation of the general interchange supervisor, shall fix a *per diem penalty* rate applicable to all cars on the road of any carrier which has refused or failed to comply with instructions from supervisors with respect to equalization of equipment, this rate to apply from the time the equalization order becomes effective until it is fulfilled or cancelled by the interchange supervisor. The penalty per diem shall be in addition to the regular per diem rate, and shall be paid into the penalty and compensation fund of the American Railway Association.

(15) Any deficit road which has made a demand for equalization which is not satisfied within ten days from the date of such demand, shall make a claim against the Penalty and compensation fund of the American Railway Association for per diem penalty on the total car days represented by the unfulfilled demand. The reclaim shall be at a rate per car per day equal to 50 per cent of the average gross earnings per car per day of all cars on the line of the demand road for the six months immediately preceding.

(16) Common cars will be at home on the line where located, and will not be handled empty in interchange except in switch service without instructions from the zone or general interchange supervisor.

(17) An excess road desiring to relieve itself of per diem payments on cars not required for loading may report its condition to the zone supervisor and make tender of all, or a part of its excess. If the zone supervisor fails to give disposition within a period of five days from the date of the tender, the excess road making the tender may reclaim against the penalty and compensation fund for the per diem on its excess cars, such reclaim to cover the period during which the excess continues, or until such time as the zone supervisor shall accept the tender or make a demand for equalization.

(18) On receipt of a tender from an excess road, the zone supervisor will tender to deficit roads in his zone sufficient cars to reduce the excess on the line making the tender, and

failing to find disposition for such cars in his zone will make similar tender to the general supervisor. A deficit road which declines a tender of equipment offered by the zone supervisor will honor a reclaim from the penalty and compensation fund for the per diem on all or a part of the deficit for such period as the deficit may continue, or until the deficit road makes a demand for an equalization.

(19) A car owner desiring the return of some particular car or cars, for a special purpose, may have such car, or cars, moved empty to a junction point with his line on payment of a reciprocal mileage charge of $3\frac{1}{2}$ ct. per car mile, plus bridge and switching arbitraries.

(20) Roads making excess empty mileage through the movement of cars in equalization will be compensated by such payments as the Commission on Car Service may, after full investigation, find to be equitable.

SECOND PRIZE—JOINT OWNERSHIP OF FREIGHT CARS

By J. W. Smith

Superintendent of Car Service, Western Maryland,
Baltimore, Md.

The various interchange and car service rules for the handling of freight equipment which have been tried out in the past, have all failed at the most critical time, with the result that at present we have a pool of equipment, unregulated, except insofar as the recent orders of the Commission on Car Service of the Railroads' War Board are being made effective. These orders, however, are only emergency measures intended to take care of conditions during a period of war and will not meet the situation when these conditions have passed. The time is, therefore, opportune for developing and perfecting a permanent plan of operation that will meet the situation which will confront us at the close of the war. This plan should be such as will recognize the rights of ownership and assure to each road at all times its full quota of equipment of the particular class or classes it owns, or in which it is interested. To do this with the present diversity of ownership would entail all of the difficulties which have confronted the railroads under the various interchange and car service rules that have been in effect up to the present time. The proper and equitable distribution of equipment between the various lines of the country cannot be accomplished efficiently and economically until some comprehensive plan of ownership is adopted and enforced which will recognize the responsibility of each road to contribute to the equipment of the country its full quota of cars necessary to protect shipments while moving over its rails.

Under the present method of placing upon the originating road the responsibility for furnishing equipment in sufficient numbers to protect the business it originates, and to carry it to destination, many roads have contributed more cars of certain classes than should be required of them while others are grievously delinquent in their obligations to contribute their share. It follows that in times of car shortage, the roads which originate large volumes of business, and which have contributed cars in sufficient numbers to carry this business to destination over the rails of other roads, find themselves depleted of equipment, owing to their cars being diverted and detained on other roads which have not contributed their share of the equipment necessary to take care of the business they originate and handle.

This situation can be overcome and the proper and equitable distribution of cars between the various roads made possible by a readjustment of ownership of the equipment on the basis of what may be termed "A plan for the Joint Ownership of Freight Cars," which may be outlined briefly as follows:

(1) Organize an equipment company, the stock of which shall be owned only by railroad companies; this company to own and control all cars which it is desirable to have placed under joint ownership.

(2) Have this company under a separate and distinct organization with a board of directors elected by the stockholders, and an independent management appointed by the board of directors.

(3) Have the stock of this company issued in different series, representing the different classes of cars owned by the equipment company, and give each railroad the right to purchase stock of any series in amounts representing the number of cars of that particular class desired or necessary to handle its business.

(4) Equalize the balances of equipment company cars on each line on the basis of stock ownership, requiring roads in excess to give up cars within a reasonable fixed period to roads that are short on their proportion, assessing appropriate penalties for failure to do so, and awarding appropriate damages to the road which has suffered.

(5) In times of surplus, require each road to accept and hold on its line its full proportion of cars owned by the equipment company on the basis of stock ownership.

(6) Have an established per diem rate, which each road shall pay to the equipment company for all cars of the equipment company on its rails; this rate should be made sufficient to cover the cost of operation and ownership, including interest, maintenance and depreciation, with a sufficient margin to cover the fluctuations in prices of material.

(7) To enable the management to know at all times the balance of equipment company cars on each road, and properly to equalize these balances between the roads, arrange a system of daily reports to be made by each road to the equipment company showing the total number of cars of each class interchanged with connecting lines; these reports to be made on a basis similar to that provided for in the "Double Entry Daily Balance Plan," for per diem settlements as outlined in the minutes of the No. 10, meeting of the Association of Transportation and Car Accounting Officers, Cincinnati, O., December, 1908, pages 1,216 to 1,240, inclusive.

(8) Have the equipment company assume the obligations and rights of owners, under M. C. B. rules, with respect to repairs and the destruction of cars.

(9) Have the equipment company purchase from the railroad's stockholders any cars in good, serviceable condition which such railroads may desire to turn in under this plan, at a depreciated or appraised value, and have the equipment company purchase such new cars of each class, of standard design and construction, as its funds will permit, and as may be desirable or necessary to protect the business of its stockholders.

The above is only a brief outline of the joint ownership plan, but it covers such of the essential features as will serve to illustrate its value. There are a number of other points, which would have to be considered in working out the details of the plan, and in this connection the following suggestions are offered:

Stock should be sold to the railroad companies at par value only, and should not be transferable except with the consent of the board of directors of the equipment company.

The par value of each share of stock of each series should be sufficient to cover the cost of a new car of standard design of the particular series represented by such stock.

Cars covered by trust certificates, the title of which can not be transferred, and which it might be desirable to place under joint operation may be leased to the equipment company for an annual rental equal to 6 per cent of the depreciated value at the time such lease is executed; certificates of lease to be issued by the equipment company covering such cars which entitle the holders to the same privileges and obligations as stock except as to dividends and assessments.

Amounts accruing from the sale of stock should be ap-

plied to the purchase of old and new equipment, a sufficient amount therefrom being set aside for a renewal account to offset the difference between the price of the old equipment purchased and the par value of the stock representing such cars.

Amounts accruing from per diem should be applied to operating expenses, the payment of rentals on leased cars and the cost of repairs; a sufficient amount being set aside therefrom for renewal account to offset the depreciation of cars in service.

The surplus, if any, should be applied as dividends on stock, while deficits, if any, should be made up by assessment on stock.

The management should be given authority to assess proper penalties against delinquent lines for failure to give up excess cars on demand within a reasonable fixed period to roads that are short on their proportion and award them as damages to the line or lines suffering thereby. These penalties and awards for damages should be sufficient to cover the full amount of loss sustained. The management should be permitted to distribute cars to roads requiring them in excess of their proportion at times when such cars are not required on other lines.

These and other matters of detail, necessary to the working out and inauguration of this plan, should be given careful consideration. I am confident they can all be worked out on a fair and equitable basis.

While this plan is in effect a pooling scheme, and therefore has all the advantages of a car pool, it eliminates practically all of the objectionable features of the various pooling plans which have been suggested. I am submitting it in the hope that it will be given full and careful consideration by all interested in car efficiency, and particularly by those who have the authority to say what shall be done in matters of this kind.

A SUGGESTED SET OF RULES

By T. H. Meeks

Chief Dispatcher, Southern Pacific Lines, Lafayette, La.

PROPOSED CAR SERVICE RULES

1. (a) The distribution and equalization of railroad-owned or controlled cars between railroads will be directed by the Commission on Car Service.

(b) Railroads will make such reports to the Commission on Car Service as may be required for the purpose of accounting for cars in their possession.

(c) Embargoes will be placed by the Commission on Car Service as may be deemed necessary to maintain an equal distribution of cars according to ownership.

2. All railroad owned or controlled cars to be:

(a) Used irrespective of ownership.

(b) Delivered empty to the home road when belonging to a direct connection.

(c) Delivered empty to the home route at any junction that will make the empty haul shortest.

(d) Delivered to any road for loading.

3. (a) When practicable to do so without delay or additional empty haul, foreign cars must be loaded in the general direction of home and system cars used locally.

(b) Cars designed by the owner for special service shall be so recognized, receive special attention and be sent, either loaded or empty, to or in the direction of the home road.

(c) Private line cars shall be handled in accordance with instructions from owners or lessees.

4. (a) It is incumbent upon a railroad receiving the line haul rate to furnish cars for loading within the switching limits of another railroad when the railroad on which cars are loaded receives only a switching rate.

(b) An equal number of cars, of the same kind, must be returned promptly, loaded within the same switching dis-

trict, or empty, to the railroad from which cars are received in switching service.

5. (a) No railroad will be permitted to retain in its possession more cars than a number equal to its ownership of each kind, and will deliver surplus of cars above its quota of each kind to connecting railroads as may be directed.

(b) A railroad may assign for any period of time, a portion of its quota of cars to another railroad, in which case the number allowed it on an ownership basis will be reduced below the number of its ownership by the equivalent of the cars so assigned to another railroad.

(c) Cars may be short-hauled from one railroad to another through intermediate railroads at a reciprocal rate of $3\frac{1}{2}$ cents per mile, plus bridge and terminal arbitraries, with a minimum of 100 miles for each railroad handling the cars, the railroad requesting the movement to pay the charges. Intermediate railroads handling cars under this arrangement may load cars received and deliver others of the same kind, when, by so doing, it is possible to reduce the delay and empty haul.

DISCUSSION

I have felt the necessity in daily practice for a specific rule governing the handling of cars between different roads in switching movements, regardless of the general balance between the lines concerned, hence the inclusion of rule 4.

Under rule 1-b the Commission on Car Service can require of all railroads a daily report giving the number of car loads of each commodity originating on their lines and the names of the railroads to which they are destined, so that it will be possible to determine daily the total number of loads moving to each line, which movement can be regulated by embargo to the extent of the ability of the destination road to handle the cars promptly.

Under rule 5-b a railroad to which cars are assigned is entitled to retain on its line a number of cars equal to its ownership, plus the number assigned to it by another railroad. The object of this rule is to permit trunk lines to take care of small lines such as coal and lumber roads whose business is principally outbound.

Rule 5-c is intended to cover movements where the intermediate line is not interested in the equalization and should be compensated for the service performed. It has often been found convenient and more economical for a railroad performing the intermediate haul to load the cars so received and substitute for them cars of the same kind at the junction point where billed.

I would also recommend that a rule be added providing a penalty for the violation or non-compliance with these rules, or any instructions that may be issued by the Commission on Car Service.

A COMBINED OWNERSHIP AND POOLING PLAN

By S. W. Fisher

Car Accountant, Fort Dodge, Des Moines & Southern,
Boone, Iowa

To increase the efficiency of car interchange, we have two periods to take into consideration: (1) the normal period when cars are available, (2) the abnormal time when there is a shortage of equipment. The writer's recommendations are very briefly:

(1) To establish an impartial commission supported by the Interstate Commerce Commission. This commission should be composed of an equal number of transportation men representing the eastern, western, northern and southern roads, with one or more men to represent the smaller lines. This commission will have charge of per diem assessments, the preparation of car service rules, and the distribution of equipment when necessary. It should have full plenary powers, and its decisions should be final. Violations of its orders should be subject to fine.

(2) During normal times, the commission should issue such

instructions as will insure car owners getting their equipment. It would be impracticable to have all cars in a pool during such a period. This plan would enable the car owner to place his cars in first class serviceable condition, he alone having all the necessary material to do so. Rules similar to those issued by the Commission on Car Service on April 18, 1917, to take effect on May 1, 1917, eliminating the penalty feature, should be placed in force, fixing the per diem rate of 75 ct. per day for closed cars, and 40 ct. per day for open cars, except that where a car owner does not average 60 per cent (or any reasonable per cent as fixed by the Commission) of his equipment on his line for the month his cars should earn \$2 per day; i. e., where a car owner does not average 60 per cent of his equipment on his line during the month of January, the Commission will instruct all lines to pay such an owner \$2 per day per diem for the month of March. If in February the per cent on the line to the total ownership is 60 per cent or more, the per diem will automatically go to 75 ct. or 40 ct. per day for April. I recommend the short routing of equipment to owners and the interchanging of empty mileage.

(3) During an abnormal period, the writer recommends the pooling of all equipment. Car distributors should be stationed at certain points throughout the country, the roads reporting their situation by wire each day to the car distributor in charge of those roads. Distributors will take care of the distribution of equipment in their territories. Wire reports should be consolidated into one form and mailed promptly to the commission which should be centrally located. If car distributors cannot supply equipment within their territory, they will immediately wire the Commission. The distribution of equipment should be carried out along such lines as can be accomplished with the minimum empty mileage.

It is the writer's opinion that the unsatisfactory car interchange may be attributed to the very low per diem rate. There has been too much difference between the freight earnings and the per diem. It is essentially wrong for a road to build cars for its requirements, be deprived of their use, pay the car repair bills, the interest and the insurance, assume the depreciation, etc., and then go begging for equipment.

Considering past experiences, the writer firmly believes that the car owner should by all means be recognized during a normal period, while during abnormal times all equipment should be pooled, eliminating unnecessary mileage and the distribution being made according to ownership and requirements.

WORKING ON CAR BALANCES

By A. C. Hasey

No condition tends to destroy freight car efficiency as much as the empty car movement incidental to the obligatory return of freight equipment to the owning roads, with the cumulative delays at successive junction points for home route rights. This is an evil of disastrous effect, reducing the use of equipment to an enormous extent and entailing a dead loss in operating expenses. If, instead of computing per diem on each individual car and in the haste of relieving a road of per diem charges, sending a car on a journey of hundreds of miles empty, the basis of per diem was upon the excess of cars held on each road over the total owned, calculated upon a debit and credit system with rights and values on all cars regardless of ownership and with a per diem charge fixed at a figure large enough to produce the incentive to keep the quota on each road near its allotment, the result would be accomplished.

Regional offices could be established covering an area sufficiently limited to prevent too large a volume of reports, to which would be reported all cars interchanged between roads in that territory in classes and a debit and credit maintained with each road daily and in turn reported to a cen-

tral office, where accounts would be balanced and settlement made monthly. Each road should take a tally of all cars and ownership in classes on the line as of the date accounts were started in the regional and central offices, with an allowance of one or two months for the adjustment of discrepancies, when settlement would begin upon the basis thus established and each road be charged at the determined per diem rate for all cars in excess of its quota.

A road having a monthly aggregate of 425 cars on its line in excess of its quota would pay per diem at the prevailing rate to the central office and a road with a monthly aggregate of 225 cars less than its quota would receive per diem on that number, preferably settled in classes. Re-claims between respective roads would be settled by the roads direct as at present. This would be the only clerical force required by each road for per diem settlement, and would result in an appreciable reduction in clerical expenses from the present methods that would offset the expense of maintaining regional and central offices.

No obligation would exist to forward cars home or in a homeward direction empty and therefore empty car mileage and car haul expense would be unpleasant memories only. A road would have the right to use any car for loading in any direction, and could be obligated to make repairs at its expense on all cars on its line, except possibly owners' defects on cars which have left home rails within a certain established period.

Accumulations caused by abnormal conditions such as existed recently in the export trade could always be anticipated and met by embargoes, and when, conversely, there was a stagnation of business and a surplus of equipment, arrangements for storing a certain quota on each road, regardless of marks, could be made effective, upon which per diem would not be charged, an arbitrary number deducted, and per diem responsibility based upon a new quota for each road.

This method would undoubtedly save enormous expense in new equipment and empty haulage. The objection that may appeal to some of having a large number of foreign cars on lines would not have much force, as this evil would not be much greater than at present. Now one foreign car is hurried toward home empty to be replaced by another foreign car and this one likewise handled, whereas under the method proposed the one car might remain longer on one road, but the result would be the same.

This situation could be met by a "gentlemen's agreement" to load cars in the direction of home where, possible, and should actually accomplish such a purpose more than present rules, with the restrictions created by the present obligation to send cars home empty, which reduces the availability of cars for use, and produces more cars available for the protection of loading in all directions.

This plan may appear on the surface to be a radical change, but a remedy of present conditions must be radical, and national exigencies demand now or in the near future an eradication of the pernicious method so inimical to industrial economy and progress.

CHINESE RAILWAY INCOME IN 1916.—The total income derived from Chinese railways during 1916 amounted to \$30,997,471, an increase of \$2,415,800 compared with 1915. The total expenditure incurred was \$14,839,614, or \$265,140 less than the previous year.

RAILWAY CONSTRUCTION IN ARGENTINA.—The following six lines are under course of construction in Argentina: Pichinal to Oran, Province of Salta, 17.4 miles; Nare to San Javier, Province of Santa Fe, 45 miles; Catamarca to Tucuman, 115 miles; Talapampa to Alemania, Province of Salta, 6.8 miles; Metan (Province of Salta) to the east, 150 miles; and Milagro (La Rioja) to Quines (San Luis), 85.6 miles.

NEW YORK CENTRAL THRIFT SPECIAL

The thrift special of the New York Central ended a three weeks' run on August 11 after making its way through the heart of New York state bearing the latest message on canning and conservation to the housewives of that section. The car started its run at Pulaski and ended at Hudson, and was one of the most effective means of following up the patriotic



The Exhibition Car

planting movement, with practical suggestions for utilizing the large surplus of vegetables and fruits.

The car was run in co-operation with the Home Economics Department of the State College of Agriculture at Cornell and with the New York State Food Supply Commission. Two expert home economics workers were aboard to demon-



An Interested Audience Watches the Canning Demonstration

strate the best methods of preserving food, to distribute literature and to answer all questions asked by the women who flocked to the daily demonstrations. The train was made up of two cars, one a regular passenger coach equipped at one end for canning demonstrations, and another fitted out with an exhibition of home canned products, with the best equipment for canning and drying, and with suggested labor-sav-

ing devices for the home. It was, in fact, an itinerant school in home economics and bureau of information on all subjects pertaining to the present emergency food situation.

The schedule of the special was mapped out some time in advance and the country adjacent to each town was placarded with the announcement of its arrival. The car stayed one day in each town on the schedule and with its flying stars and stripes and signs bearing the words, "Thrift Campaign" and the slogans, "Waste Nothing," "Practice Patriotism," was a valuable object lesson in conservation. Each afternoon a two-hour demonstration was given in the canning of various products by the home economics experts.

The visitors to the car averaged 150 or 200 a day, in spite of the terrific heat which lasted through a good part of the run.

RAILROAD BUILDS COW BARN

Efforts to secure economy in the construction and operation of railroads as well as in the maintenance of the road and equipment, or in extending their commercial influence, have frequently led railroads into activities more or less remote from pure railway transportation. As an illustration of the diversity of such activities the Boston & Albany recently constructed a sales cow barn at Brighton Stock Yards, Boston. This building is the property of the railroad but is leased and operated by the Brighton Stock Yards Company of Boston.

The new barn is 215 ft. long and 138 ft. wide of reinforced concrete throughout with metal sash and standard fire doors. The floor is concrete and the stanchions are all metal, making the building as fireproof as possible. The

backs of the cattle and is so full that it will not be necessary to take them out of the stalls in order to make a full examination. This, it is expected, will reduce greatly the time required for inspections.

The building will accommodate 400 head of cattle. A complete drainage system is provided so that every part of the interior can be disinfected and washed down, hydrants being provided for that purpose. A small restaurant for use on sales days is provided at one corner of the building, adjoining which is an office and sleeping quarters for the cattle inspectors. These quarters are heated by steam and hot water is also provided.

Construction on the building was started on March 12, 1917, and it was opened for business July 9, 1917, 21 days ahead of the contract time allowed. The piers, foundation walls and walls were built of 1: 2: 4 concrete, the outside



A Portion of the Exterior



A View Along One of the Alleys

risk of a fire in the feed and bedding is provided for by the installation of nine hose lines distributed at convenient points in the service alleys, and also by the placing of fire extinguishers near each of the doors.

The federal cattle inspectors examine all cattle in this barn and therefore the distribution of light, both natural and artificial, required careful study. It was finally determined to eliminate all side lighting and secure natural lighting altogether from overhead, and artificial lighting by the distribution of a large number of small unit electric lights.

The elimination of all windows in the outside walls of the building was also to reduce maintenance costs for broken glass, which is found to be a very heavy item in buildings lighted from the sides. The lighting results are beyond expectations, and have worked out most satisfactorily, every part of the building being uniformly lighted. It was noted from the photographs that the light falls directly on

being given a rough surface and the inside a smooth surface. The granolithic floor was constructed of 1: 3: 6 concrete for the lower 4 inches, with a 1-in. finish of 1 to 2 mortar laid simultaneously with the concrete and finished with a wood float. At least 8 in. of engine cinder was laid under the concrete and thoroughly compacted before the floor work was started. The roof slabs were constructed of 1: 2: 4 concrete reinforced with Kahn bars. The total cost of the building and paving adjacent thereto was \$70,000.

The barn which this building replaces was of timber construction and required a constant force of six to eight carpenters to maintain it properly; it was destroyed by fire after having twice suffered damage from this cause. The new building was designed and constructed by the engineering department of the Boston & Albany, under the direction of F. B. Freeman, chief engineer, to whom we are indebted for the above information.

MILITARY TRANSPORTATION.—Speaking in the House recently as to the work done during the year by the Ministry of Munitions, Dr. Addison said: "The other day Sir Douglas Haig paid a high tribute to the work of military transportation. It has been the duty of the Ministry (of Munitions) to supply the goods, except that the transfer to France of a certain amount of existing railway stock was undertaken by the Railway Executive Committee. The quantity of locomotives, trucks and track required was so great that to manufacture all in time—even if there had been the raw material to spare, which there was not—would have been an impossibility. To meet the program track was pulled up at home. India, Australia and Canada sent their contributions. More than 2,000 miles of track have already been supplied in a complete condition, and nearly 1,000 locomotives of various kinds, apart from hundreds supplied by the Railway Executive Committee."

A 120-Ton Coal Car for the Virginian

One of Four Experimental Cars Built Without Drop Doors to Unload in the Car Dumper at Sewalls Point

By B. W. Kadel

ONE of the four experimental 120-ton gondola cars which are being constructed for the Virginian Railway by various builders, has recently been completed and delivered by the Virginia Bridge and Iron Company, Roanoke, Va. The design of this car demonstrates certain special features of construction of this class of equipment. It is built for use in bituminous coal carrying service between the West Virginia fields and the tide-water terminal of the Virginian

The ratio of stress to end strain for this sill is .057, a factor well within the recommendations of the M. C. B. Association. In addition to this there are no open holes or cuts of any description in the sill, it is well braced and stayed both in a vertical and a horizontal plane, and it is not called upon to carry any of the weight of the lading, thus eliminating vertical bending.

To prevent the center sill from receiving bending stresses



Virginian 120-Ton Flat Bottom Coal Car Built by the Virginia Bridge & Iron Company

at Sewalls Point, Va., there to be handled over the road's car dumper.

The principal dimensions of the car are as follows:

Length inside	50 ft.
Length coupled	53 ft. 7 in.
Distance between truck centers	37 ft. 4 3/4 in.
Width inside	9 ft. 8 1/2 in.
Width over all	10 ft. 3 1/2 in.
Height of sides above rail	11 ft. 1 1/2 in.
Height of sides inside at ends	7 ft. 3 3/4 in.
Volume level full	3,785 cu. ft.
Volume with 30-deg. heap	4,422 cu. ft.
Truck wheel base	9 ft.
Truck weight	16,350 lb.
Capacity	218,000 lb.
Weight	73,900 lb.
Ratio of revenue load to total load with 10 per cent overload	76.4 per cent

The car body is of plate and angle construction with Carnegie cross-tie sections for side stakes and end plate stiffeners. To provide for corrosion the minimum plate thickness is 3/4 in., and no angles of less than 1 1/4-in. stock have been used. Heavier stock is used wherever needed.

The principle of the design is that the weight of the lading actually be transferred to the sides of the car, the integrity of the center sill as a draft member being maintained. The center sill is a Bethlehem 12-in. 84.5-lb. H-section and extends not quite to the bolster at either end of the car. The ends of the center sill are milled and are attached to steel castings, which form a portion of the National Malleable Castings Company's radial draft gear, so that the buffing forces are delivered to the center sill, not through the rivets, but as direct loads upon the ends of the sills. The center plates are integral parts of these steel castings.

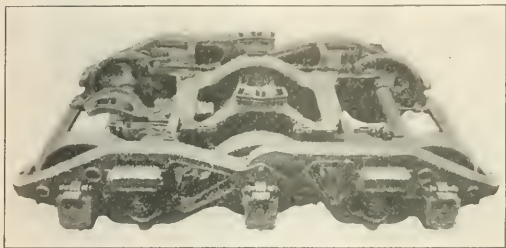
of any moment from the lading, three plate girder diaphragms are provided to carry the load out to the side plate girders. These have the compression members passing continuously over the center sill and the bottom or tension members passing under the sill. At the outer diaphragms the floor line of the car is dropped down to the plane of the lower face of the center sill, thus increasing the capacity of the car and lowering its center of gravity.

The sides are constructed of 1/4-in. plates with a bottom chord of angle section and a bulb angle for the upper chord. From the depressed portion of the floor to the ends of the car the size of the bottom chord angle is reduced, as its load is less nearer the bolsters. The side plates are also cut away here in line with the floor over the trucks, not only to eliminate unnecessary metal, but to give an unhindered view for the inspection of the trucks. No cross-ties are used, the sides being stiffened by means of wing plates which extend between the diaphragms and the inside side stakes. Between the diaphragms are located the stakes on the outside of the car so that they bear against the blocking on the cradle of the car dumper. The top angle, grab irons, etc., are thus protected, while the alternating inside stakes with their stiff wing plates support the car and prevent the sides from bending in when the cradle is rotated. The ends of the car are stayed against bulging by means of two Carnegie cross-tie sections extending from side to side. Because of the excessive depth of the car at the ends inside ladders are supplied.

The sides of the car are carried by the body bolsters which

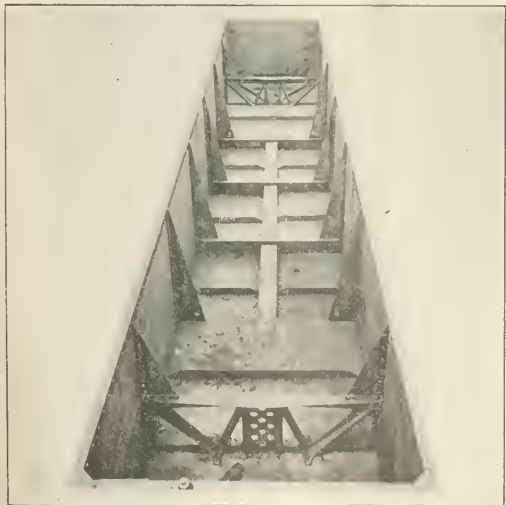
are of novel construction. They are integral steel castings, located above the floor of the car within the coal space, and are shaped not only to give an economic and advantageous disposition of the metal for the various conditions of load applications, but at the same time to offer no obstruction to the coal in dumping. Wing plates extend upward from the outer ends of the bolsters to stay the sides of the car. The bolsters are a product of the American Steel Foundries.

The floor is stiffened between the diaphragms with angles. The diagonal angles for stiffening against poling are located above the floor to clear the brake rigging of the trucks.



Lewis Articulated Six Wheel Truck

Because of the great weight of the car it is necessary to provide definite jacking points specially designed to take care of this operation. Two jacking blocks are provided at each corner of the car, the one being under the end of, and in reality a part of, the cast-steel body bolster, the other being a part of the corner poling pocket. Either of these blocks will support the load of that corner of the car, so that the



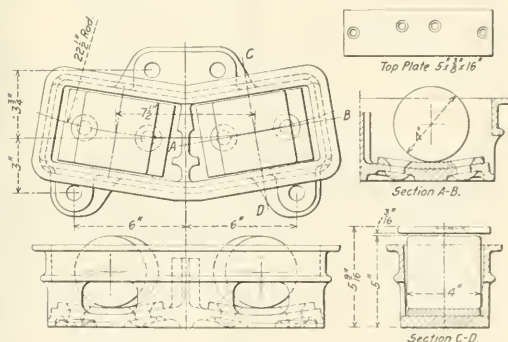
Interior of the Virginian Coal Car Showing the Unique Steel Transom Castings

car can be jacked up at one of these points and stood off the other. The jacking face on the bottom of the push pole pocket bears directly against the bottom end of the corner angle of the car body, and serves to strengthen the push pole pocket and the corner of the car. The push pole pockets also have bracket portions which extend out and engage stops on the cradle of the dumper, should the overhead clamps for

any reason fail to hold the car when in inverted position. This feature is used on other equipment of the Virginian Railway. Wooden planks are set into the outline of the center-sill section to present a smooth face for the sliding of the coal and prevent its hanging up when dumping the car. These are held in place by means of removable stops upon the diaphragms, and are accessible from the outside. No open holes are left in the center sill for securing this planking.

The trucks for this car are of the Lewis Articulated* six-wheel type manufactured by the American Steel Foundries, and are equipped with McCord pressed-steel journal boxes of the Vulcan type and Davis cast-steel wheels. Each truck weighs 16,350 lb. The length of the wheel base is 9 ft. and the height of the center plate is $26\frac{1}{2}$ in. above the rail. The center plates are 16 in. in diameter, and are machine faced. The bolster springs are of extra large capacity. The bolsters are fitted with Stucki Frictionless side bearings of the two-roller type, the rollers being four inches in diameter and four inches long. The axles are M. C. B. Standard with 6-in. by 11-in. journals.

The car is equipped with the Westinghouse Air Brake Company's empty and load brake. A 16-in. by 12-in. load cylinder and 10-in. by 12-in. empty cylinder are used, the latter having a 4-in. preliminary slack take-up piston. The brake is designed to give a braking power of 40 per cent for the empty or loaded car. The trucks have clasp brakes, the arrangement of which has been worked out especially to prevent excessive reaction loads in the side frames. The foundation brake gear and the clasp brakes were furnished by the



The Stucki Two-Roller Type Side Bearing

American Brake Company. The Banty ratchet hand brake is used.

The car is equipped with the National Malleable Castings Company's radial draft gear, which is pivoted to the ends of the center-sill construction, and is swung with the truck through the medium of an arm connected with the truck bolster. The draft gears at all times stand approximately tangent to the track and in line with each other, so that in buffing the forces have little tendency to displace the couplers. The coupler heads are specially made with side abutments or stops which allow but a limited movement of the couplers out of line in buffing.

The volume of the car is 3,785 cu. ft. level full and 4,422 cu. ft. including a 30-deg. heap. Its light weight, including the specialties mentioned, is 73,900 lb., of which 32,700 lb. is in the trucks and 41,200 lb. is in the body.

While it is generally known as of 120 tons capacity, the car in reality is stenciled 218,000 lb. in order that the allowable loads for the 6-in. by 11-in. axles may not be exceeded

*For a description of this truck as originally designed, see the American Engineer for January, 1913, page 35.

when the car is given a 10 per cent overload. On this basis the load per pair of wheels with 10 per cent overload amounts to 52,283 lb., or a load of approximately 49,900 lb. on the M. C. B. 50,000-lb. axle.

The car represents the results of extensive experience and careful study and was worked out jointly by the builders and the motive power department of the Virginian Railway. The aim in the design has been to eliminate as far as possible all useless metal and to this end an especially careful analysis of the known forces and stresses was made. Under the most extreme conditions of loading, the extreme combined stresses have not been allowed to exceed those given in the table, based on 10 per cent overload in the car. As far as possible

STRESS LIMITATIONS OBSERVED IN DESIGN OF VIRGINIAN 120-TON COAL CAR
Stress, lb. per sq. in.

	Structural parts	Steel castings	Rivets
Tension	13,000	9,000	.....
Compression	13,000	9,000	.....
Shear	9,000	8,000	8,000
Bearing .....	.....	.....	16,000

the secondary stresses have been analyzed and allowed for, and it is hoped later to have available for publication the method of calculation for the various portions of this car.

MORE CARS ORDERED TO WEST AND SOUTH

To facilitate the prompt movement of grain and food products, as well as lumber and munitions, the Car Service Commission of the Railroads' War Board has ordered the immediate distribution of 20,790 additional empty cars among the lines operating in the South, the West and the Southwest, some of which will go from the East to the Pacific Coast.

This will make a total of 106,033 empty cars that have been ordered moved from one railroad to another, regardless of ownership, during the past three months, in order to mobilize in different sections of the country a sufficient number of cars to handle the abnormal government and commercial traffic that war conditions have produced.

Of the latest cars ordered by the War Board to be distributed where they will be most needed, 7,800 are to be placed in the grain-producing country. One thousand of these go to the Southern Pacific, and 500 to the Western Pacific, to insure the speedy movement of a huge shipment of barley. Other roads receiving cars to accelerate the movement of grain and farm products are the Missouri, Kansas & Texas, the Missouri & North Arkansas, the Kansas City, Mexico & Orient, the Atchison, Topeka & Santa Fe, the Missouri Pacific, the Wabash, the Nashville, Chattanooga & St. Louis, the Chicago, Rock Island & Pacific, the Illinois Central, and the St. Louis-San Francisco.

To protect the vegetable and Southern watermelon crops, more than 5,000 cars have been sent to the Atlanta, Birmingham & Atlantic, the Central of Georgia, the Seaboard Air Line, the Atlantic Coast Line and other roads operating in the Southeast.

Meanwhile, hundreds of cars are being rushed daily to the lumber states of the South to take care of the tremendous movement of lumber to the army cantonments and shipbuilding yards.

In addition to the demand for lumber, the war has practically doubled the orders for phosphate rock during the past three months. This product, which is essential to the operation of sulphuric acid plants and the manufacture of munitions, is also used as a foundation for fertilizer. In the past, the coastwise vessels carried a large volume of it, but with the reduction in the number of vessels used for freight purposes along the coast, practically all this traffic has been diverted to the Atlantic Coast railroads. As a result, it has been necessary to send thousands of cars into that district.

To protect the movement of sulphur for the munitions factories, hundreds of cars have been ordered to the Kansas

City Southern, the Southern Pacific and the Gulf Coast Lines.

More than a thousand stock cars have also been sent into Texas to enable the cattle raisers there to get their herds into the western pasture country.

The roads to which the latest order of 20,790 cars has been consigned, together with the number of cars consigned to each, are as follows: Central of Georgia, 1,300; Chicago, Peoria & St. Louis, 200; Mississippi Central, 135; Southern, 3,025; Atlantic Coast Line, 1,700; Illinois Central, 600; Georgia, Florida & Alabama, 30; Missouri Pacific, 600; Richmond, Fredericksburg & Potomac, 100; Georgia & Florida, 300; Tennessee Central, 100; Georgia, 200; Seaboard Air Line, 1,000; Louisville & Nashville, 1,700; Mobile & Ohio, 1,000; Louisiana Railway & Navigation Company, 500; Wabash, 1,000; Missouri, Kansas & Texas, 1,000; St. Louis Southwestern, 500; Carolina, Clinchfield & Ohio, 300; Chicago & Alton, 500; Louisiana & Arkansas, 200; Missouri & North Arkansas, 300; Kansas City, Mexico & Orient, 500; Chicago & North Western, 500; Atchison, Topeka & Santa Fe, 500; Nashville, Chattanooga & St. Louis, 500; Chicago, Rock Island & Pacific, 500; Southern Pacific, 1,000; Western Pacific, 500; St. Louis-San Francisco, 500.

Fourteen thousand seven hundred of these cars, or a little more than two-thirds of the entire order, are to be supplied by the Pennsylvania System. The other roads that have been ordered to supply empties include the Western Maryland, Philadelphia & Reading, Cleveland, Cincinnati, Chicago & St. Louis, Boston & Albany, Boston & Maine, Central Railroad of New Jersey, New York, Chicago & St. Louis, Chesapeake & Ohio and the Norfolk & Western.

WASHINGTON CORRESPONDENCE

WASHINGTON, D. C., Aug. 14, 1917.

REORGANIZATION OF THE INTERSTATE COMMERCE COMMISSION

President Wilson on August 9 signed the bill providing for the reorganization and enlargement of the Interstate Commerce Commission, which requires him to appoint three new members, including a successor to the late Judson C. Clements, to bring the number up to nine. As President Wilson appointed Commissioners Hall and Daniels, a majority of the reconstituted commission will, therefore, be his appointees. It is reported that the President will send his nominations to the Senate this week. The names of nearly 100 candidates for the position have been recommended to him.

It is assumed that shortly after the new members are chosen the commission will be able to announce its organization into divisions as provided by the law, as it has had this plan under consideration for a long time, while the bill has been progressing slowly through the various parliamentary stages for nearly two years, and because it was suggested by the commission itself in order to enable it to organize its work in a way to promote greater efficiency. Under the old law all acts of the commission were presumed to represent the combined judgment of all its members, and although the great mass of work imposed on the commission naturally required it to delegate much of its work to subordinates and in many cases opinions were written mainly by examiners or represented the work of one commissioner only, the fact that the entire commission was technically responsible for everything that was done naturally made each member feel it incumbent upon him to give at least some personal attention even to minor matters. Under the new plan the commission may place responsibility for various departments of its work on committees or divisions of its members who may act for the commission and have all the jurisdiction and powers now conferred by law upon the commission. This will relieve other members of the commission from the responsibility of keeping in close touch with the

work that is delegated to divisions except in cases of great importance. Provision is made for a rehearing by the entire commission as provided in the act.

A few years ago it was customary for members of the commission personally to travel about the country hearing rate cases. Of late years the volume of business handled by the commission has increased so greatly that this has not been possible. The commissioners are in Washington most of the time and hearings are usually held before examiners, or attorney-examiners, who not only take the testimony but review it and in the majority of cases prepare the opinions, under the supervision of a commissioner. The opinions as written are then passed upon by the commission in conference and either approved, modified or sent back to be rewritten. In important cases the opinions are written by commissioners with the assistance of the examiners and attorneys who heard the evidence.

Under the division plan the entire commission need not participate in the conferences in ordinary rate cases, but the work of the examiners will be reviewed by a division, which under the law must consist of at least three members. Ordinarily the decision of the division will be final except in cases of such importance that the entire commission will want to pass on it, or where a rehearing is asked.

Within the past year or so the commission has considerably expedited and simplified its work by the plan of serving on the parties in advance copies of the examiners' tentative report as the basis for the oral argument before the commission. In this way the argument may be confined to the findings and time need not be wasted in arguing points which have been accepted. In many cases oral argument is heard by the examiner at the conclusion of the testimony.

The plan of submitting the tentative report has worked very satisfactorily, in the opinion of those who practice before the commission, and has enabled the commission to issue its final decision in a much shorter time after the submission of the case, than was formerly required.

The commission has also issued the following notice to those who practice before it, making suggestions for further conservation of time in arguments before it:

"Increasing demands make it imperative that the time of the commission be conserved as far as possible. The principles applicable in tariff cases are fairly well known to all of us. There is relatively little controversy about the facts. The issue usually turns upon the significance of those facts, under the principles applicable, as determinative of the controversy.

"The commission feels justified in asking counsel to confine their attention in oral argument to those features which in their judgment are determinative. The detail is presented in the record, can be developed on brief, and is largely susceptible of check by comparison with tariffs or reports on file.

"The opportunity now afforded for argument before the attorney-examiner at the close of the hearing conducted by him and our present practice of putting out his statement of facts and proposed conclusions in advance of the argument tend to clarify and focus the issues for oral presentation before the commission.

"In such case the proposed report of the attorney-examiner and the exceptions thereto should be used as far as possible as the basis of the argument. The statement of facts as given in the proposed report, if accurate and adequate, need not be repeated unless in an expository way at the opening, and the argument should be directed as far as possible to the conclusions suggested by the attorney-examiner.

"Much expenditure of time and money will be obviated if the parties on the same side of a controversy agree in advance upon the person or persons who shall come to Washington and make the oral argument. Their interests can be more effectively presented in 60 minutes by one or two counsel than

by half a dozen speaking 10 minutes each. Hitherto it has not been customary to apportion the time among those desiring to be heard until after they presented themselves on the morning of the day set. Hereafter Frank C. Stratton, chief of the commission's docket division, should be advised at least 10 days before the day set of the selection of counsel and the time needed.

"From and after resumption of arguments in October, the time allotted will ordinarily not exceed one hour in minor cases and three hours in major cases, except as exceptional complexity or importance may in the judgment of the commission warrant exceptional treatment."

APPROVAL OF RATES BEFORE FILING

The new provision in the bill which became a law on August 9, that no increased rate shall be filed except after approval has been secured from the commission, will work a considerable change in the methods of filing tariffs. It was adopted by Congress, with very little consideration, although after the conferees appointed by the Senate and the House had discussed it with members of the commission and a representative of the railroads, as a substitute for the Senate amendment proposed by Senator Smith. The purpose of the Smith amendment was to prevent any increase in rates without suspension if any one in the United States filed a protest. The new provision is far less drastic and, as the commission already had the power to suspend rates, either on protest or on its own initiative, it would seem that about all it has accomplished is an increase in the amount of red-tape involved in getting tariffs made effective. Heretofore the railroads have simply filed their tariffs 30 days in advance of the effective date, the commission's tariff force has checked them over to see that they complied with the rules, and, ordinarily, unless there has been a protest, they have automatically gone into effect, the shippers having been given an opportunity to make any protest by the 30 days' public posting.

Now the commission will have to take some action before the tariffs can even be filed, but, according to the law, this approval may, in the discretion of the commission, be given without formal hearing, and in such case shall not affect any subsequent proceeding relative to the rate involved. In other words, approval of the filing of a rate in such circumstances does not carry any decision as to its reasonableness, and protests or complaints may be filed after the filing or after the effective date of the tariff, as before. The commission is given power to prevent even the filing of an increased rate if it desires to do so, but it is rather difficult to understand how this represents any real increase in the power it previously possessed to suspend a rate that had been filed or to declare it unlawful, although it might make it rather difficult to secure a review of the commission's action. The commission has issued a notice to all carriers to cover the tariffs that were in transit to the commission at the time of the signing of the bill.

The commission's notice states that the act means "that the approval of a proposed increased rate, fare, charge, or classification must be secured before the tariff containing it is forwarded to the commission for filing," and adds:

"As tariffs are at all times in transit to the commission for filing and in order to avoid unnecessary complications due to invalidation of such schedules, the commission approves, without hearing, such increased rates, fares, charges, or classifications as may be included in tariffs which are forwarded for filing prior to August 15, 1917.

"As to increased rates, fares, charges, or classifications contained in tariffs that are issued or forwarded for filing on or after August 15, 1917, the approval of the commission to the increased rate, fare, charge, or classification must be secured before the tariff is forwarded for filing, and as to all

such tariffs that are issued on or after August 25, 1917, the title page must bear reference to the serial number and date of the commission's approval."

PRIORITY BILL NOW LAW

The President also signed on August 10 the bill authorizing him to direct that such traffic or such shipments of commodities as, in his judgment, may be essential to the national defense and security, shall have preference or priority in transportation, but he has not yet designated the person or persons to issue such directions for him. In adopting the House substitute for the Senate bill Congress omitted the provision which would authorize carriers to enter into agreements for the division of earnings, and also the amendment to the Senate bill proposed by Senator Reed authorizing the Interstate Commerce Commission to order the railroads to acquire equipment.

UNLAWFUL TO LIMIT TRANSPORTATION FACILITIES

The food control bill, passed by Congress last week, in section 4 carries a provision making it unlawful "to conspire, combine, agree or arrange with any other person to limit the facilities for transporting, producing, harvesting, manufacturing, supplying, storing or dealing in any necessities." A number of senators, particularly Senator Hollis of New Hampshire, who often acts as spokesman for the railroad brotherhoods in Congress, opposed very vigorously the idea of including such a provision without some proviso to prevent it from operating against "peaceful" strikes. Senator Hollis wanted it qualified by an amendment stating that "nothing in this act shall be construed to repeal, modify or affect either section 6 or section 20 of the Clayton law," designed to prevent the prosecution of a strike conspiracy under the anti-trust law. Other senators who discussed this provision of the bill asserted that it could not be used to prosecute labor leaders who might order a strike, because the prevention of strikes was not included as one of the purposes of the bill in its preamble.

Just before the bill was passed Senator Husting told the Senate that he was authorized by the Secretary of Labor to say that the administration and the Department of Justice do not construe this provision of the bill as prohibiting strikes and peaceful picketing and will not so construe the bill. Senator Newlands expressed the opinion that a contention might well be made that section 4 does limit and restrain the power to call strikes, but he said that if that was its effect the result would have been secured by indirection because Congress had refused to meet the question squarely by supporting bills he had introduced to prevent strikes of railroad operators contingent upon the creation of a tribunal for the adjustment of differences between employers and employees. The priority bill as passed by Congress contains a provision to prohibit some of the effects of a strike, but the prohibition is directed rather against the obstruction of interstate commerce than against calling a strike, and Senator Hollis in this case secured the adoption of his amendment that nothing in the bill should be construed to modify the effect of sections 6 and 20 of the Clayton law.

BILL TO REGULATE PRICES

While the War Industries Board of the Council of National Defense and the various government departments are wrestling with the question of prices of materials for the government and for the allies, efforts are being made in some quarters to attempt to bring about a reduction in prices to consumers other than the government. Senator Pomerene of Ohio has introduced a bill to provide for regulating the production, sale and distribution of iron ore, iron, steel and other products. It would give the President authority to fix prices for these products not only for the government and the allies, but for the private consumer as well. If prices cannot be agreed upon the President would be given power

to take over the mills and operate them. The President now has power to commandeer such plants for war purposes only.

WAR TAX BILL

In the revised war revenue bill now under consideration in the Senate, which increases the proposed income tax on corporations from 4 per cent, as originally proposed, to 6 per cent, the title of the proposed "excess profits" tax is changed to "war profits" tax. The rates of taxation on the excess of net income over that received in the pre-war years 1911, 1912 and 1913, a graduated scale ranging from 12 to 50 per cent, remain the same as in the Senate bill reported on June 28, but there are several changes in the language. For instance, Section 201 now includes the following: "For the purposes of this title all the trades and business in which a corporation or partnership is engaged shall be deemed to be a single trade or business, and all its income from whatever source derived shall be deemed to be received from such trade or business."

The original bill included provision for an exemption of 6 per cent in the case of corporations whose income was less than that amount during the pre-war period. This is omitted in the revised bill. Instead it is provided in Section 205 that if the Secretary of the Treasury upon complaint finds either that during the pre-war period the net return of any domestic corporation was low as compared with the net return during such period of representative corporations, partnerships and individuals engaged in like or similar trade or business, or that during the pre-war period the ratio between the net and gross income was substantially less than the like ratio in case of representative corporations engaged in similar business, then the war profits shall be the same proportion of the net income received during the calendar year as that of representative corporations engaged in similar business, the proportion to be determined by the Commissioner of Internal Revenue in accordance with regulations prescribed with the approval of the Secretary of the Treasury.

The 10 per cent tax on undistributed surplus is made to apply to the amount remaining undistributed six months after the end of the calendar year, deducting the amount actually invested and employed in the business or retained for employment in the reasonable requirements of the business.

BELGIUM NEEDS RAILWAY SUPPLIES

The special Belgian mission in the United States is understood to have outlined in a tentative way to officials of the United States government plans for securing large quantities of railway supplies and equipment from this country for rehabilitating the railway lines of Belgium at the first opportunity.

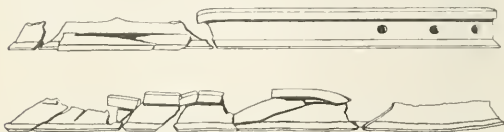
NATIONAL ARMY TO MOVE IN SEPTEMBER

Regulations to govern the call to the colors of the 687,000 men that will compose the new national army have been issued by Provost Marshal General Crowder. These call for the transportation first of 30 per cent of the number, or about 200,000, to the various training camps beginning on September 5. The next 30 per cent are to begin entraining on September 15, another 30 per cent on September 30, and the remaining 10 per cent will be mobilized as soon after that date as possible.

LOW FARES FOR BRITISH MUNITION WORKERS.—The Ministry of Munitions announces that, in order to facilitate the transfer of labor to important work, arrangements have now been made whereby working people proceeding to work of national importance on which they have been placed through an employment exchange or the Ministry of Labor will be provided with a railway warrant to enable them to travel at the rate of five-eighths of the ordinary fare in operation before January 1, that is, considerably less than half the present full fares.

SEAMINESS AS A CAUSE OF RAIL FAILURES

H. W. Belnap, chief of the division of safety of the Interstate Commerce Commission, has issued a report of an investigation made by James E. Howard, engineer physicist, of the rail failure occurring on the Pennsylvania Railroad, Sodus Bay branch near Newark, N. Y., on February 16, 1917. The broken rail caused the derailment of a passenger train consisting of a locomotive and two cars traveling at the rate of 35 to 40 miles an hour. The rails were 60-lb. steel rails rolled by the Cambria Steel Company in 1887 and laid the same year. The ties were oak and pine 17 per panel, with tie plates on the pine ties. The broken rail was on the inside of a curve. There were no defects in the wheels



Assembled Fragments of the Broken Rail

or flanges of the derailed equipment to indicate any contributing cause for the accident. An abstract of Mr. Howard's report follows:

The type of fracture was a split head. Failure took place in the receiving half of its length. About three feet of the rail, at its immediate receiving end, remained intact. Beyond this part there was a broken section, 8 ft. 4 in. long, followed by an unbroken section, 18 ft. 8 in. long, completing the length of the rail, 30 ft. The unbroken section was locally bent at the time of the derailment. Forty-eight fragments of the broken section were recovered.

The appearance of some of the recovered fragments assembled in their relative places is shown in the drawing.

The top of the rail showed an increase in width of 0.18 in., as nearly as could be judged when the fragments were put together. This increased width corresponded substantially with the width of opening of the seam in the head, a relation generally found in splithead rails.

Lateral flow of the metal occurred in the shallow zone between the running surface of the head and the upper edge of the seam. The formation of a split head is attributed to the wedge action of the steel in this affected zone, reaching streaked metal, starting an incipient seam where the metal of the head in a crosswise direction is deficient in strength or in ductility, or both. The incipient seam gradually develops in length and in depth until there is complete separation of the head.

Seaminess of the steel was shown on polished and etched sections. Cross-sections of the rail showed these markings as dots and short lines; on a longitudinal section they appeared as streaks. Attention is called to the difference in the formation of these streaks in different parts of the rail. In the upper part of the head and the lower part of the base they are needle shaped, or acicular. In the web and at the junction of the web with the head and the base, these needlelike streaks are converted into seams of considerable width.

The longitudinal streaks are believed to have had a direct influence on the formation of the split head. Examples of split heads have been witnessed in different stages of development, and incipient seams have been found to coincide with and follow the paths of interior streaks. The quest for the primary cause of the presence of streaked metal leads back to the ingot. Efforts to introduce streaks by heat or mechanical means have been unsuccessful. Conversely, their removal by heat or mechanical means has not been accomplished. Sudden quenching of hot steel will cause the formation of thermal cracks, but such cracks are of a different order to the streaks

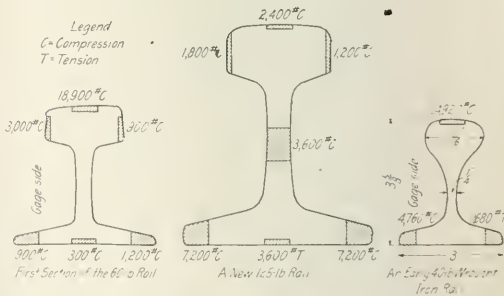
and seams under consideration. These are present in steel which has cooled slowly.

Mass segregation occurs in the cooling of ingots, shown in the chemical analysis of the metal. There are slag or other nonmetallic inclusions in different parts of the ingot and blowholes are also found. The large reduction in sectional area given the metal of the ingot orients these structural conditions and leads to the formation of longitudinal streaks in the rail. Lengthwise the rail this structural arrangement seldom affects its serviceability. In a crosswise direction, however, the character of the streak becomes an important factor, especially when service stresses approach the limit of endurance of the steel.

The streaks brought to view upon etching with tincture of iodine differ in their characteristics, each variety assuming greater or less importance, depending upon the severity of the service stresses. There are streaks which represent metal enriched in carbon; others in which ferrite predominates. In these streaks the continuity of the metal is not lost. The welding of blowholes may be partial, the efficiency of which in a degree depends upon the composition of the steel. The presence of slag is a barrier against welding and at such inclusions the continuity of the steel is interrupted.

Wheel pressures which cause lateral flow of the metal in the head of the rail differentiate the properties of these streaks. Whenever evidence is presented of permanent flow having taken place, the rail problem has evidently passed beyond the stage in which the elastic limit of the steel is a controlling factor. The rail is practically certain to fail in course of time, under a repetition of these overloads. The life of the rail may be prolonged or its type of failure changed by the elimination of streaks. It is highly desirable that structural soundness be attained as nearly as the art of steel making permits. A margin in strength should be maintained between working loads and the ultimate resistance of the rail in which structural soundness is an essential factor.

A number of rails of different weights and of more recent fabrication were examined in conjunction with the 60-lb. rail which caused the present derailment, and disclosed the prevalence of streakedness in some degree in all of them. A comparison of rails of early fabrication with those of current



Internal Strains in Different Kinds of Rails

manufacture is favorable for those which are being made at the present time.

Measurements were made of the internal strains in the rail which caused the present derailment, also those which were in other rails taken from the track. Service conditions introduce strains into all grades of steel, and of all weights and types of rails. The values of these strains amount to many thousand pounds per square inch, and they are permanently retained in the metal, in wrought iron as well as in steel. An old wrought-iron rail, which was examined, displayed the presence of strains which had probably been locked up in

the metal upward of 40 years. These internal strains may be modified by track conditions, and the state of internal strain of a rail, when properly interpreted, is a reliable index of what occurred in the track preceding the time of the examination.

The failure of the present rail was undoubtedly precipitated by the seamy state of the metal in the head. The steel was of medium hardness in respect to its chemical composition. Wheel loads had not distorted the general shape of the head except at the broken section.

Repeated impulses along different elements of the head, their paths varying according to the lines of contact made by wheels of different contours of treads, had effected a hardening of the surface metal covering a width of two inches.

Internal strains were introduced, amounting to many thousand pounds compression, measured in the direction of the length of the rail. Lateral flow had taken place in the metal next the top of the head, shown at the surface by a flattening of the grains, and necessarily exerting an effect on the interior metal. Under the influence of lateral flow, it is believed that an incipient crack was started in the interior of the head, this effect reaching some line of structural weakness, or place where the continuity was interrupted by a slag or other seam.

A measurable increase in the width of the head, in rails which have otherwise maintained their primitive shape, commonly signifies that a seam is in progress in the interior. Very soft rails may show increase in width without a split head necessarily being in process of development. The detection of a split head in the very earliest stage of its development does not appear feasible. In its more advanced stage the general increase in width of the head, or droop at the under side, or a discolored line along the running surface, are the recognized indications of the presence of a split head. By reason of the difficulties attending the detection of a split head before it has reached an advanced stage, and the possibility of error in judgment in interpreting the significance of the first visible indications, every effort should be made to eliminate the presence of streaks from the steel. The sequence of the passes in the rail mill, in the reduction of the bloom, is shown to be favorable in respect to the modification of the form of the streaks which are located in the different parts of the cross section of the finished rail.

A careful examination of the metal at different stages from the ingot to the finished rail is essential for a thorough exposition of the subject of streaks. Blowholes and shrinkage cavities disappear from view in the early passes of the blooming mill. Slag or other nonmetallic inclusions, found in globular form in the ingot, are drawn into acicular lines in the finished rail. These structural variations are frequently of such an order that the results of chemical analysis do not adequately indicate the state of the metal. Drillings for chemical analysis taken at a streak are so diluted by the surrounding metal that the characteristics of the streak are obscured. If the seaminess is due to an incompletely welded blowhole, structural rather than chemical manifestations should be looked for. Microscopic examination offers a promising method of test in this connection.

All rails are subjected to internal strains, which are not negligible factors, as the magnitude of their values indicates. If it were feasible to furnish rails initially free from internal strains they would not remain so. The cold rolling of the wheels in the track promptly introduces strains at the running surface of the head. No grade of steel has been examined which has resisted this action of the wheels.

In conclusion it appears: That the failure of the rail which led to the present derailment was caused by a split head;

That the split head resulted from a condition of streaked and seamy metal;

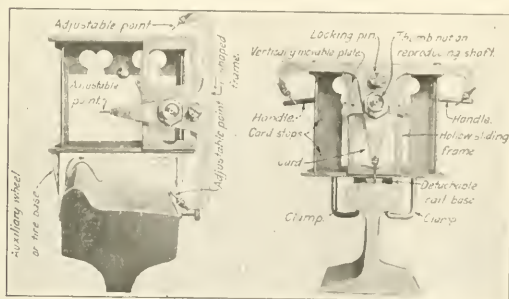
That ingot conditions were responsible for this streaky state;

That warning was given of the development of the fracture by a decided increase in the width of the head prior to the time of derailment; and that such warning called for the removal of the rail from the track.

A RAIL AND TIRE CONTOUR RECORDER

A new machine for reproducing an accurate full-size cross-section of a rail head, car wheel or locomotive tire on a card or metal plate has been perfected by B. F. Deuel, Yonkers, N. Y., under the name of the Deuel rail and tire contour recorder.

The device is being used for taking rail sections by the New York Central and is also being tried out for use on tires. It consists of a metal frame on the face of which is attached a hollow frame which slides longitudinally, on which in turn is mounted a plate which moves vertically, both sliding on roller bearings. A T-shaped frame with adjustable points is secured to the plate by pivots and a reproducing shaft, actuated by a spring so arranged that the spring can be removed easily to permit the resharping of the lead or the insertion of a metal point passes through the center of the T-frame. Immediately above this shaft is a device, also operated by a spring, which locks the T-



Front and Back Views of the Device

frame upon the plate to retain any of its arms in an operative position. A grooved slide with a stop at one end insures cards or plates for tires being replaced in the same position when used again. In this way one card can be used for the entire life of a wheel or tire.

The rail base is detachable and is held in place by two clamps supported by springs. No special adjustments are necessary for different weights of rails as the instrument is held in place perpendicular to the rail while in use by clamps supported by springs which engage the under side of the rail. This arrangement permits the instrument to be attached or detached in a very short time. For use on tires the rail base is replaced by an auxiliary base which has two legs, one of which will engage in two punch marks previously made in the tire and which are also used for subsequent sections taken on the same tire. The other leg has a thumb screw which is set in the wear groove or a punch mark and holds the instrument in position on the tire.

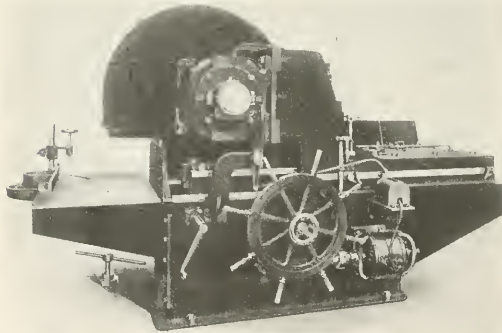
After the instrument is attached the card or plate is inserted in the groove and is kept from moving by tightening the thumb nut on the back of the card. One of the side arms of the T-frame is then brought in contact with the side of the rail or tire, first pulling out the locking pin above the reproducing shaft so as to rotate the T-frame to the desired position. The reproducing point is then released by a slight turn of the thumb nut which will permit the point to come in contact with the card or plate. The arm is then moved

downward, keeping it in contact with the rail or tire to the limit of the movement. After this the reproducing point is raised and, by giving it a slight turn, it is held away from the card which the T-frame is being revolved through 90 deg., bringing the center arm to the first point on the rail or tire. The reproducing point is then released as before and the arm moved across the top of the rail or tire. By revolving the T-frame 90 deg. more in the same direction the other side arm in the T-frame is brought into contact with the rail or tire and, after releasing the reproducing point, the instrument is again moved down to the limit, giving a full size reproduction of the rail head, car wheel or tire.

For rails a card or plate about $3\frac{3}{4}$ in. square is required and the record obtained can be transferred to a tracing showing the original section and the worn area can thus be noted. The instrument weighs 6 lb. complete and can be carried in a traveling bag or a 4-in. by 9-in. by 11-in. case.

A SAW FOR RAIL RECLAMATION

The advantage of sawing off the ends of rails released from tracks is becoming generally appreciated by railway officers. Several railroads have adopted the practice and others have the matter under consideration. More attention is being given to the reclamation of second-hand rails in order that the maximum service may be secured from them when relaid, because of the fact that rails on tangent tracks



The High Speed Friction Saw

are taken up largely on account of the characteristic battering of the heads near the ends of the rails and the wearing of the fishing surfaces. The economy of resawing is naturally dependent upon the efficiency with which it can be done.

The friction saw has been practically applied in some industries for about 10 years, but it is only within the last four years that it has been developed for the cutting of rails in reclamation work. In the friction saw the metal is melted or burned away by the heat generated through the friction of the rapidly moving saw blade against the metal of the piece being sawed. It has the advantage of extreme rapidity of action and economy in operation and maintenance. As the saw blades are without teeth they are much cheaper than the regular tooth saw and can be replaced at much smaller expense.

The saw machine shown in the illustration has a toothless blade 46 in. in diameter by $\frac{1}{4}$ in. thick, direct connected to a 45-hp. electric motor. The saw and motor are mounted on a carriage propelled by a second motor of 1 hp. capacity attached to the side of the machine base. Through the movement of this carriage the saw is brought into contact with the rail and caused to follow through as the metal is cut away. When the operation is completed the carriage motor

is reversed and the saw is withdrawn. The entire outfit weighs less than 13,000 lb.

Another advantage of the machine is that the rail can be cut without need of clamping it into fixed position. As shown in the photograph the center line of the saw blade is mounted slightly above the rail section. Consequently the blade itself answers as a sort of automatic clamping device, forcing the rails hard against the retaining clamp attached to the table.

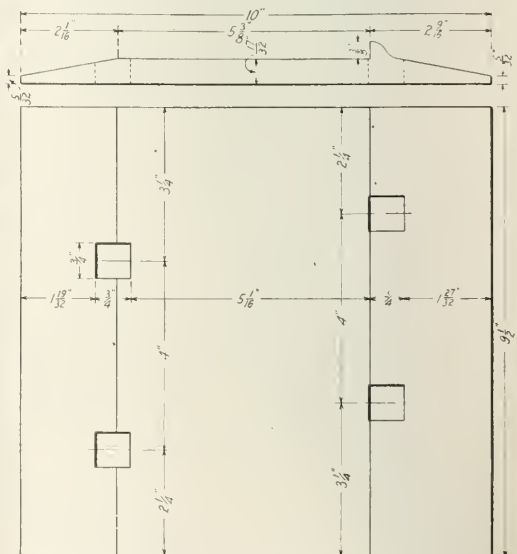
Installations of these saws at railway reclaiming plants include one at the rail mill of the Chicago & North Western at Boone, Ia., and one at the reclaiming shop of the Chicago Great Western at Oelwein, Ia. The saw at the Boone plant has been operated at a cost of \$0.54 per gross ton of rails handled, including the cost of unloading, cutting, drilling, reloading, and removal of the scrap. Rails of 72 lb. section have been cut off in 20 sec. and as many as 354 rails have been sawed in 10 hours. This high speed friction saw is manufactured by Joseph T. Ryerson & Son, Chicago, Ill.

A HEAVY TIE PLATE

The drawing shows the details of a tie plate adopted by the Southern Pacific to secure the full advantage of larger size ties which were made standard on that road about two years ago. These ties are 7 in. by 10 in. by 8 ft. in size, it being the conclusion that this size would be more proportionate to the present day loads.

Prior to the change the standard tie for all service was 7 in. by 9 in. by 8 ft. With the adoption of the larger tie for main lines a 7-in. by 8-in. by 8-ft. tie was made standard for use on branch lines and sidings, these relative sizes conforming more nearly to the comparative service requirements. Eighteen ties are used per 33-ft. panel.

The new tie plate is $9\frac{1}{2}$ in. by 10 in., giving 95 sq. in. of bearing area on the timber as compared with 70 in. with



Details of the Tie Plate

the plate formerly used. This tie plate is $17\frac{1}{32}$ in. thick and has a $\frac{3}{8}$ -in. shoulder. It extends $2\frac{19}{32}$ in. beyond the base of the rail on the shoulder side and $2\frac{9}{32}$ in. beyond the base on the inside. It weighs 12.21 lb. The use of these larger plates has been found to decrease materially the tendency of the rail to "roll out" on curves.



Locomotive No. 1, the First of 680 Consolidations for Service in France. Was Built in 20 Days

U. S. A. War Locomotive Completed in 20 Days

This is the First Unit on Orders for 1064 Locomotives and 8997 Cars for U. S. Service in France

LAST Saturday, just 20 working days after the order was placed, the Baldwin Locomotive Works completed the first locomotive on its order from the United States Government for 150 engines for service with the American troops in France. The contract was received July 18 and was given preference over all other work, either foreign or domestic. Speedy construction was also considerably facilitated by the similarity between these locomotives and the Consolidation locomotives which the Baldwin Locomotive Works have been building for the British War Office, the two locomotives being almost alike except that the American locomotives will have superheaters and the British have not. The Baldwin Locomotive Works is continuing its speedy work on these locomotives and will turn them out at the rate of four a day.

The locomotives are of standard gage; they weigh 166,400 lb. and will have a tractive effort of 35,700 lb. Their cost is said to be about \$43,000 each. The general dimensions follow:

Gage	4 ft. 8½ in.
Cylinders	21 in. by 28 in.
Driving wheels, diameter	56 in.
Total wheel base	23 ft. 8 in.
Driving wheel base	15 ft. 6 in.
Weight, total engine	166,400 lb.
Weight on drivers	150,000 lb.
Tractive effort	35,700 lb.
Boiler, diameter	70 in.
Boiler pressure	190 lb. per sq. in.
Number and diameter of tubes	5¼ in., 26; 2 in., 165
Length of tubes	13 ft. 9 in.
Firebox	122 15/16 in. by 38½ in.
Heating surface, firebox	181 sq. ft.
Heating surface, tubes	1,681 sq. ft.
Heating surface, total	1,862 sq. ft.
Superheating surface	420 sq. ft.
Grate area	32.7 sq. ft.
Tank capacity	5,400 U. S. gal.

The speed with which this first locomotive has been built, however, is only one sign of the aggressiveness being shown relative to equipping the railroad lines which our regiments of railway engineers will build behind the sectors to be held by the American troops in France. The War Department has thus far distributed orders for 150,000 tons of rails. On July 18 it placed orders for 300 large locomotives; early in the present week it ordered no less than 764 more locomotives, this making 1,064 in all, and 6,000 30-ton standard gage and 2,997 narrow or 600 mm. (1 ft. 11½ in.) gage freight cars, all for service with the troops in France.

The standard gage freight car order, as noted elsewhere in this issue, was distributed among five companies as follows:

1,200 low side gondola cars—Pressed Steel Car Company,

1,000 box and 300 tank cars—American Car & Foundry Company.

900 high side gondola and 800 box cars—Standard Steel Car Company.

600 flat and 300 refrigerator cars—Haskell & Barker Car Company.

900 box cars—Pullman Company.

These cars are all two-truck cars of 30-ton capacity, whereas the cars in general use on the railways in France are four-wheel cars of not more than 20-ton capacity.

The narrow gage cars were distributed thus:

500 flat cars and 100 trucks—Pressed Steel Car Company.

166 tank and 700 low side gondola cars—American Car & Foundry Company.

400 low side gondola cars—Ralston Steel Car Company.

400 low side gondola cars—Magor Car Company, and

666 box and 165 gondola cars—Standard Steel Car Company.

The original locomotive order for 300 locomotives was for standard gage 80-ton Consolidation locomotives and was divided evenly between the American Locomotive Company and the Baldwin Locomotive Works. The new order for 764 locomotives placed this week has been given entirely to the Baldwin Locomotive Works, and is especially interesting other than as to its size, because it includes a large amount of narrow gage equipment. The order includes 380 additional standard gage Consolidation locomotives; 195 600-mm. (1 ft. 11½ in.) gage Prairie type locomotives, 126 50-h.p., 600-mm. gage gasoline locomotives, and 63 30-h.p., 600-mm. gage gasoline locomotives. These orders will, of course, have preference over all other business.

Some people are under the impression that the order placed July 18 was the first order for locomotives ever placed by the United States Government. This is not the case. During the Civil War, Brigadier General D. C. McCallum, general manager of the United States Military Railroads in the Military Division of the Mississippi, had to purchase a large number of locomotives and cars for the Federal railways south of Nashville, Tenn. He acted under orders from Secretary of War Stanton, and found the railway supply industry on the job then just as he would find it now. "It is proper and just to state," he wrote, "that the requisitions of this order were met by all in a spirit of zealous patriotism. The manufacturers at once placed all their available force at work upon the engines and cars ordered, which were all completed and delivered in an unprecedented short time."

WAR PRISONERS AS RAILROAD LABORERS

By Our Special European Correspondent.

When the armies of the United States in Europe begin to take prisoners in large numbers, it is not unlikely that they may be shipped to the United States and put to work there to lessen the labor problem created by the mobilization of the troops that captured them. At least this has been the method used so far by all the nations at war. The photograph is a typical picture that may be seen in Italy, in France, in England, or Russia, or any of the Central Empire countries. Here we see a handful of Austrian prisoners, some of the hundred and odd thousand taken by the Italians, at work near the new railroad which is to connect the port of Ostia, Rome's ancient seaport, with modern Rome.

Thanks to these prisoners, work is being done that has been contemplated many years but which is only this year under full headway, and the city of Rome, which for a couple of thousand and more years was connected with the sea, some eighteen miles distant, by a road of stone, will soon have a road of steel. This new railroad is being built for the purpose of converting Ostia into a summer resort for the great mass of Rome's population which is too poor to ride to the more expensive and distant sea resorts.

The handling of prisoners in the beginning of the war was

ALL IS NOT WELL WITH THE GERMAN RAILWAYS

"Germany's weak spots are . . . three—men, transport and Allies,"—the New York Times in a copyright cable despatch quotes a prominent Swiss manufacturer as saying: "The first two are intimately connected. Apart from the never-ending and gigantic drain of the armies, Germany has made colossal efforts to cope with the huge demand for war materials. By concentrating on a standardized pattern of their most useful weapon, the cannon, she has been able to reply to the allied artillery augmentation and still increase the output of other growing necessities, like grenades and machine guns. . . .

"But all this effort has been screwed up to the topmost notch. No further increase is possible, and even to attain that result sacrifices have been imperative. That is where the question of transport becomes important. Not only are the railroads—lines, sleepers, and roadbeds—in bad repair and short of men to operate them, but war material requirements have compelled the Germans to withdraw labor from the manufacture of new rolling stock. Men who have worked on the German railroads tell me they are often forced to put in 36 hours without relief, and with that be incessantly at grips with defective material. Of course, accidents are



Austrian Prisoners Building a Railroad at Ostia, Italy

a problem, at least for the Allies. The Germans and Austrians soon showed the way war prisoners should be handled by putting theirs to work. While the Allies have not resorted to the barbarous treatment of prisoners resorted to by the Central Empires, prisoners are now no longer treated as gentlemen of leisure. They are put to work, though given good food and a small wage to encourage them. Indeed, the majority of the prisoners prefer work to idleness. In Italy the prisoners are given work of the above description or in the fields.

In France prisoners have for two years been employed on the docks, on the repair of railroads, in the fields and in similar occupations.

The English have 58,000 prisoners in England and many more thousands employed with the army in France on railroad reconstruction work.

As many of these prisoners are only too glad to get free of the fighting and as many of them would be only too glad to get to the United States under any conditions, the prisoners of our armies will rejoice, as one might say, in an opportunity to lighten our labor problems.

common. They are increasing and there is no way out of the vicious circle.

"Just one illustration. Last winter Berlin had a coal famine, though Germany is one of the greatest coal producing nations, simply because it was impossible to rush coal trains to the city at the moment when water transport was blocked by ice."

FORMER UNITED STATES VICE CONSUL'S STORY

"Considerable disintegration has taken place in the material organization of Germany as well as in her spiritual organization," says A. Curtis Roth, former United States vice-consul at Plauen, Germany, in an article in the Saturday Evening Post. "The German railroad systems not only have been greatly disorganized by war but have suffered a significant deterioration. It has been impossible to keep the roadbeds in repair, to replace the worn rails and switches, and to renew the rolling stock. The result is, the railroads are no longer the efficient roads they were at the outbreak of the war. The trains now are invariably from one to three or four hours late, and it is impossible to move troops today

on the schedules that prevailed in the early part of the war. This, of course, is a very real factor in the reduction of Germany's military efficiency.

"It has been impossible, too, to keep the great state roads—the Landstrassen—in repair. Those roads, which in former days were the envy of motorists from all parts of the world, are now worn deep with ruts and fretted with hollows. Thousands of Russian and French prisoners have been kept at work upon these roads; but, so heavy have been the traffic requirements of the armies at the front, it has not been possible to keep pace with the amount of repair work necessary.

Superior means for communication has been a prime necessity in German strategy, and it is the deterioration of her state roads and railroads that has, to a great degree, lamed the striking power of her armies.

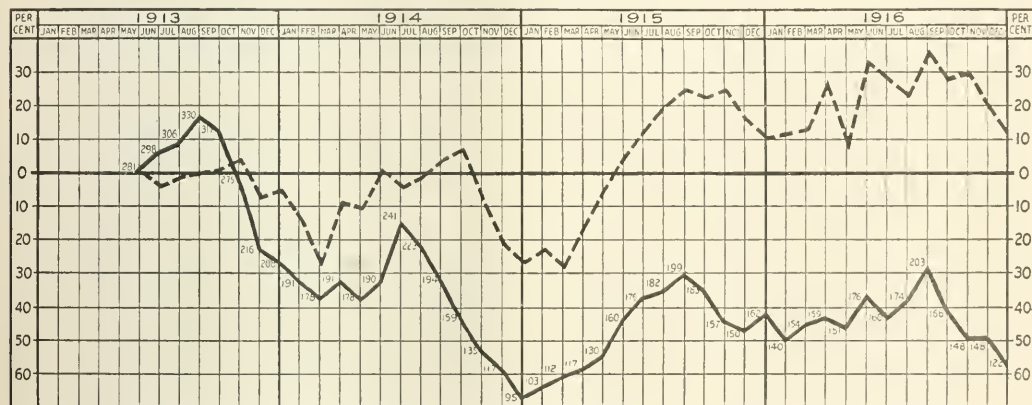
NEW EQUIPMENT HARD TO OBTAIN

Some extremely interesting figures regarding the operating difficulties of the Prussian railways were recently given in the Journal des Transports of Paris. It appears that at

SAFETY ON THE NORFOLK & WESTERN

The Norfolk & Western has had no train accident within five years in which any passenger was killed; and in this time the number of passengers carried has been about 34 millions. Since May, 1913, when the "safety-first" movement was begun on this road, there has also been a marked improvement in the record of safety of employees, and the progress in this respect is indicated by the diagram showing the increase, or decrease, month by month, in the total number of injuries to employees; and on the same diagram there is shown in the broken line the increase in the volume of freight traffic, measured in ton-miles, during the same time. The lines of the diagram, starting together in May, 1913, were, at the end of last December, 69 per cent apart.

Another record has been made up for the years 1912 to 1916, inclusive, showing the reduction in the number of employees killed on duty, as compared with the volume of freight traffic. Compared with 1912, the increases in traffic, year by year, were, in ton-miles, (1913) 10 per cent, (1914) 5 per cent, (1915) 22 per cent and (1916) 42 per cent; while the employees killed, all causes, as compared with



Injuries to Employees on the Norfolk & Western as Compared with Fluctuation of Business. Percentage Based on May, 1913

the end of 1915, out of 25,176 locomotives, as many as 4,300 were being employed either in allied or invaded territory, while at the same time 30 per cent of the total locomotive stock was undergoing repair. This is said to be due, not to the heavy traffic, but to the bad quality of the materials used, which are largely "substitutes" for those normally employed. New rolling-stock is also being built at a lower rate, due partly to higher prices, and while 27,728 cars were bought in 1915, the total for last year was only 22,267.

Compared with last year, the cost of locomotives has risen by 40 per cent and that of freight cars by 26 per cent, and on the authority of the Secretary of the Essen Chamber of Commerce there will be further increases of 25 and 20 per cent, respectively, on the locomotives and freight cars to be delivered this winter. The same person has also complained that too many railwaymen have been mobilized. The total number called now amounts to 200,000, and while 80,000 women and 20,000 prisoners have partially replaced them, these substitutes are too badly fed to be good employees, and three prisoners are said to do the work of only two ordinary men. Another difficulty is that the more territory occupied by Germany, the more she has been obliged to send her rolling-stock away for long distances, with the result that the increased mileage run decreases the stock available.

1912, decreased 23 per cent, 41 per cent, 41 per cent and 49 per cent. There was a somewhat smaller decrease in the number of employees injured.

A JUDGMENT OF SOLOMON.—A study of what the French call the "divers facts" recorded in the daily press reveals many little incidents and dramas of railway interest. For instance, there is the recent case of the Birmingham soldier's wife, who, when fined at Willesden for traveling on the London & North Western Railway with intent to defraud, informed the magistrate that she had never been in a train before. We can easily understand the magistrate's incredulity. However, he had an easier task than the judge who was lately asked to award \$2000 damages against the Bavarian State Railways in respect of "loss of beauty" by a 17-year-old governess. Plaintiff's face had suffered contact with a carriage door, causing the loss of several teeth and other blemishes, and she therefore sought to convince the court, not only that she was not pretty, but that her chances of marriage were diminished. After a lengthy hearing, and evidence by "three expert connoisseurs of female beauty," the young woman was awarded her \$2000, plus a monthly solatium of \$50 until she married, in which event her "diminished eligibility" would cease to have any but an academic interest.—*Railway Gazette, London.*

General News Department

The Santa Fe has addressed a circular letter to employees who have to do with the handling of freight traffic, urging them to put forth every effort to conserve freight equipment and prevent loss of and damage to freight shipments.

The Union Pacific has issued a booklet containing information of interest to those who have relatives who have been called to the colors. The booklet gives answers to more than a thousand questions regarding the location of the new army training camps and other matter concerning the various branches of the service.

The lumber committee of the Council of National Defense has reported that, with a slight improvement in the supply of empty cars being furnished to the sawmills getting out lumber for the cantonments and camps, a better movement resulted. Up to August 4, of the 12,220 cars originally ordered for the cantonments, 11,675 cars, or 95.45 per cent, had been shipped.

To facilitate the transportation of laborers employed at the Great Lakes Naval Training Station, Great Lakes, Ill., the Chicago & North Western is running three special trains to the camp each morning and three returning in the evening. The company transports approximately 3,000 skilled and unskilled laborers, bricklayers, carpenters, etc., to and from the station each day.

The Indiana committee on information for the Railroads' War Board has announced the following officers: H. F. Houghton, general agent of the Cleveland, Cincinnati, Chicago & St. Louis, chairman; Joseph F. Hall, general passenger agent of the Lake Erie & Western, and J. H. Baumgartner, publicity agent of the Baltimore & Ohio Southwestern, members of the executive committee.

The State Public Service Commission of Washington has adopted a resolution setting forth that in its opinion the erection of new stations and the elimination of grade crossings is work that can be deferred until after the war, or for some time at least. In the resolution the commission also favors the curtailment of passenger service so that the men and money may be used in other lines.

A section gang of women has just been put to work on the main line of the Lehigh Valley. Nine women, working under the direction of an experienced foreman, comprise the gang, which operates on the west end of the Buffalo division near this city. The women are performing all the regular duties of similar gangs of men, tightening bolts, putting in new ties, and tamping ballast. Pneumatic ballast tampers are used by the Lehigh Valley.

The American Defense Society has asked the railroads of the country to run "food instruction" trains to aid the movement for the conservation of food. Letters have also been sent to the mayors of various cities and the heads of the state councils of defense in various states urging them to take up the question with the railroads in their home territory. It is pointed out in the letter that extraordinary success has resulted from a similar movement by the Long Island. Each train, according to the plan, would be manned by speakers and demonstrators working under the state and local committees in co-operation with the railroads.

Officials of the Pennsylvania Lines West at Ft. Wayne, Ind., have felt that, due to the shortage of common labor, it might be necessary for them to endeavor to use women for light labor, and also on the light machine tools and such other work as they may be expected to handle. No facilities have been provided as yet to make possible the employment of women, but the road proposes to install the necessary toilets and rest-rooms at once, so that they will be ready should the emergency arise. No steps have been taken for the adoption of a standard uniform for women, such as the Pennsylvania Lines East of Pittsburgh are now supplying their women workers.

The Interstate Commerce Commission has issued a supplement to its rules governing the classification of steam railway

employees, providing that until further order, railways may be relieved from the requirement of recording and reporting the number of hours on duty of the following classes of employees: M. W. & S. foremen, section foremen, gang and other foremen—M. E. department, electricians, employees in outside agencies, other traffic employees, crossing flagmen and gatemen, draw-bridge operators, other transportation employees, and all other employees. Instead they may record and report the number of days served by these classes of employees.

Attorney General McGhee and the State Public Utilities Commission of Ohio have been investigating reports that the Toledo & Ohio Central and the Hocking Valley have been selling coal cars to the Canadian government. The Attorney General has stated that he is ready to take action to prevent any cars owned by Ohio railroads from being sold for use in another state or country, inasmuch as the railroads, in their demand to the Public Utilities Commission for authority to increase freight rates, have urged as a reason for such increases the need of getting more money with which to get additional rolling stock. The Hocking Valley has denied that the company sold any cars recently, and stated that the last sale of cars made was over three years ago.

The Missouri Pacific has sent out a card addressed to its patrons, officers and employees, thanking them for their co-operation in helping to reduce the car shortage by loading cars to capacity, and moving and releasing them promptly. An appeal is made for still greater co-operation, and it is pointed out that two tons more in each car would equal 200,000 more cars. The company asks any persons having suggestions on the subject to send them to the road's officers, who will be very glad to receive them. On the reverse side of the card there is an illustration of a freight car and a copy of a poem entitled "Who Am I," reproduced from the St. Louis Furniture News. The poem deals with the greatly increased importance of the freight car, and contains an appeal to speed up the handling of the cars.

President Earling of the Chicago, Milwaukee & St. Paul has issued an appeal to the loyalty and patriotism of the employees of the company to "do his or her utmost to render the maximum of service, in not only promoting operating efficiency, but also in promoting military efficiency and bringing nearer the dawn of peace." The appeal calls upon all men who are handling the trains to reduce the consumption of coal, fuel, oil or lubricating oil; to avoid delays in stations and promote the prompt and careful handling of passengers and baggage. It calls upon the yard crews to increase the number of cars handled, and to reduce the damage to cars; station agents are urged to reduce the detention of cars and secure increased loading thereof. Detailed suggestions as to the best means of accomplishing results will be put forth by the officers of the company in charge of the several departments.

Thirty-four Dead in Italian Wreck

Press despatches report that 34 persons were killed and 100 injured in the derailing of the Genoa-Milan express at Arquata on August 6.

Highway Crossing Gates Ordered Closed After Midnight

After August 22 the late returning automobilist will have to wake the crossing watchman before he can cross a railroad track inside the limits of New York City. The New York Public Service for the First district has adopted an order directing the New York Central, the Long Island and the Staten Island Rapid Transit to keep the gates at 145 highway crossings closed between midnight and 5 a. m. as a measure of protection to vehicle traffic. The order will take effect on August 22, and was favored by the railroads and the city police department. It was brought out at the hearings that it had been found extremely difficult to keep the crossing watchmen awake and on the job.

19 Killed and 50 Injured in Trolley Accident

Nineteen people were killed, including one who died the following day, and between 40 and 50 injured, when two electric cars collided head on, late the afternoon of August 13, at North Branford, twelve miles east of New Haven on the Shore Line Electric Railway. Both cars were crowded. The accident was probably caused by the crew of the westbound car which, according to orders, should have waited on a siding less than a half-mile from the spot where the accident occurred. Instead it kept on, the crew for some unexplained reason planning to reach the next switch. It later developed also that the dead man's handle on the westbound car had been fastened down so that it would be inoperative. The motorman and conductor of the westbound car escaped injury, but the motorman of the eastbound car was killed. Approaching a sharp curve the car crashed into the eastbound car from New Haven. The force of the impact telescoped the cars fully half their length.

Discontinue the Valuation!

There has long been a question in many minds as to the practical wisdom of the valuation of the railroads by the government. The task will require so long a time that values are certain to be materially altered before the great task is completed. . . . Now that nine regiments of railway engineers are to be sent to France, why not abandon the valuation of American railroads for the period of the war? Railway employees of the highest character, experience and skill have been commandeered, as it were, for the government valuation. These are just the type of men needed for the rehabilitation of the French railways. This nation can't afford to send tyros to do the work in our sister republic. We must send the best we have. Why not divert the amount appropriated by Congress for valuation to the equipment and maintenance of engineer regiments?—*Cincinnati Enquirer*.

New York Commission Will Originate Legislation

The New York Public Service Commission for the First district has announced a plan for "drafting legislation in the open." The law under which it was created explicitly authorizes the commission to recommend legislation as to corporations and matters within its jurisdiction, and provides that the commission may hold hearings and take testimony in respect to any matter of legislation. This method the commission proposes to apply to the formulation of future legislation amending the public service commission's law, the railroad law, the transportation corporation's law and other statutes affecting public service corporations and their rates and service. Corporations will be invited to submit their legislative proposals in advance for scrutiny. Individuals interested in the perfecting of legislation will be also invited to follow the same course. Every company under the jurisdiction of the commission has been invited to participate, and hearings will begin on Wednesday, August 15, 1917.

Privilege vs. Right as Applied to Passes

The Erie has joined those roads who are asking their employees traveling on passes not to hold their seats while paying passengers are standing. "An employee using a pass," says the notice to the Erie employees, "is enjoying a privilege of transportation. A passenger holding a ticket has paid for a right of transportation, which must be regarded as in every way superior.

"Under war conditions trains will, at times, unavoidably be crowded. It may not always be possible to give every passenger a seat, but certainly none should stand while railroad employees of either sex, holding passes, are seated. The obligation of an employee in such a case is plain and rests upon the principles of courtesy and right.

"The success of the railroads in coping with the great burdens which the war is laying upon them depends very largely upon their ability to retain the confidence and win the co-operation of the public.

"Every employee who shows courtesy and consideration helps toward this end; every one who fails in these respects hinders it.

"Here is a chance to help!"

The Pennsylvania's Frank Thomson Scholarships

John Morrow Daniels, of Freeport, Pa., and Eugene F. Dawson, of Columbus, Ohio, have been awarded the Frank Thomson scholarships for 1917.

Mr. Daniels, who was awarded the scholarship for the Lines East, is 20 years old, and has been a student at Kiskiminetas Springs School, Saltsburg, Pa. He will enter the University of Pennsylvania next fall, in the engineering department. He is the son of J. J. Daniels, assistant trainmaster, Conemaugh division, Freeport, Pa.

Mr. Dawson, the recipient of the Lines West scholarship, is 21 years old, and is a graduate of the North High School, Columbus, Ohio. He intends to enter the engineering department of the Ohio State University. He is the son of William E. Dawson, passenger car builder, Pennsylvania Lines' Shops, Columbus, Ohio.

The Frank Thomson scholarships were established in 1907 by the children of the late Frank Thomson, formerly president of the Pennsylvania Railroad, as a memorial to their father. The purpose of the scholarships is to enable sons of living or deceased employees of the Pennsylvania System to obtain technical educations, and so fit themselves for the service of the railroad. Two scholarships are awarded each year, upon competitive examinations; one goes to a son of an employee of the Lines West, and the other to a son of an employee of the Lines East of Pittsburgh.

Carry Home Your Purchases

Governor Whitman of New York has issued a proclamation to the people of that state in which he says:

"Men are needed for productive labor. They must be reserved for such work and not drawn therefrom to do non-essentials. If you will show due consideration, your dealer will be able to supply men for productive fields, instead of withdrawing them therefrom. The needless delivery work that you put upon stores means an unnecessary drain on the country's man power.

"At the request of the Editorial Conference, representing the leading business newspapers, I desire to point out that every shopper can be patriotic in five ways:

- "By carrying parcels home whenever possible;
- "Accept without complaint less prompt deliveries in war time;
- "Do not demand special deliveries;
- "Avoid having goods sent home unless you are sure you are going to keep them;
- "Bring back to the store such goods as are portable when return cannot be avoided.

"The stores will give you the best service in their power, but both the stores and the public must do their duty to the country.

"As governor of the state of New York, I ask the public to do these things for the welfare of our country during the war."

The *Railway Age Gazette* and the other papers published by the Simmons-Boardman Publishing Company are members of the Editorial Conference mentioned in the proclamation.

One Way to Save Meat

President Harrison, of the Southern Railway System, has issued a statement calling attention to the fact that one of the ways in which a very substantial saving of our meat resources may be made is through reducing the number of animals killed on railroad tracks. On the railroads of the United States many thousands of cattle and hogs are killed every year, and as those killed in this way are not used for food, this loss results in a correspondingly large decrease in our available meat supply.

"The responsibility for this loss rests primarily on the owner of the animals who allow them to stray on the railroad right of way," says Mr. Harrison. "When they are killed the law places the responsibility on the railroad and the owner suffers no direct pecuniary loss. There is, however, in addition to the serious reduction of the meat supply of the country, a further economic loss through the payment by the railroad of money, which is urgently needed at this time for increasing the transportation facilities of the country, the lack of which for the movement of his products to market may cause a loss to the farmer greater than the amount he received for the animals killed on the rail-

road. The extent of this loss may be indicated by the fact that the Southern Railway System alone paid out in the 12 months ended June 30, 1917, more than \$200,000 for animals killed on the right of way. This sum, even at the present high prices of equipment, would be sufficient to buy more than 100 standard box cars capable of handling at a single load more than 3,000 tons of freight, and the constant use of these many additional cars would tend to the relief of the present war-time congestion of traffic. Is it not the patriotic duty of every farmer to keep his live stock away from the railroad tracks?"

General Agent J. S. Rockwell, of the Buffalo, Rochester & Pittsburgh, speaking along the same line, says that, "In the face of a threatened food shortage, it becomes more than ever important that farmers along the railroad tracks should keep their gates closed to prevent live stock from straying out on the tracks and being struck by the first train that comes along. Cattle killed in this manner are usually rendered unfit for food, and the result is a total loss as far as helping feed the nation and winning the war is concerned. On a recent inspection, an officer of the Buffalo, Rochester & Pittsburgh observed that 33 out of 82 gates on the Buffalo & Rochester divisions had been left open. Carelessness in not closing gates renders useless all precautions and safeguards placed to keep animals off the tracks, and results in large numbers of them being killed yearly.

"It can be said without prejudice, if the fences maintained by the property owners were kept in as good a state of repair as are the right of way fences maintained by the railway companies, one of the frequent causes of cattle getting on the track would be eliminated to a considerable degree. It often happens that cattle placed in a field where a railroad company's fence is perfectly secure and the gate closed, will wander into the adjoining pasture through the poor fence between, and then, because the gate to that field has been left open, the animals finally get onto the tracks and frequently are killed."

Department of Commerce Urges Use of Waterways

Secretary Redfield of the Department of Commerce has issued a statement calling attention to the importance of making use of navigable waterways in every manner possible to the end of lessening the burden of traffic upon our railroads, because the latter are now carrying a volume of tonnage unparalleled in history, and further imperative demands are going to be made upon them.

"Not only is it patriotic in communities and individuals to endeavor to lessen pressure upon our railroads," the secretary said, "but it is economic common sense. Our waterways are a tremendous asset which each community can realize on largely. This can be done in the main, at small expense; and in this work the Department of Commerce and the Shipping Board stand ready to aid wherever possible. The wisdom of preparing now will be demonstrated later; and that municipality or district, foresighted enough to take steps to use these water highways, will reap abundant substantial benefits, aside from the merit of having co-operated with the efforts being made to lessen the burdens on the railroads. This latter is no less than a patriotic duty.

"According to a report by the Storage Committee of the General Munitions Board, in certain of the belligerent countries in Europe, the railroads are available for general commercial traffic only one day in seven. This is an indication of what may, in some measure, be expected here when we get into the full swing of this war work. By diverting all unnecessary burdens, in the utilization of our abundant waterways, we should be in vastly better position, and commerce generally should not feel the lack of transportation, inevitable if these waterways are not made use of. The government will thus be facilitated in its colossal task of moving enormous numbers of men, enormous amounts of necessary equipment, baggage, horses, stores, material, munitions, foodstuffs and freight for export.

"The Department of Commerce is endeavoring to help these waterside communities make use of the means at hand. Its work is handicapped to some extent at present by lack of force and facilities; however, Congress has been asked for a small appropriation in order that this assistance may be carried forward energetically. Doubtless the funds will be allowed, as no more important piece of interior development work of a creative nature can at this time be seen. Meanwhile, any community interested, or individuals or groups of individuals, with plans for

using inland waterways are requested to write the particulars to the Department of Commerce, and wherever possible, hearty and energetic co-operation and assistance will be rendered."

Increased Efficiency in Car Loading

A report made public by the Chicago, Burlington & Quincy shows that that system has effected an increase of 28 per cent in average tons per loaded car for the month of June, 1917, compared with June, 1916. The road handled an average of 29.38 tons per car in June, 1917, and 22.98 tons per car in June, 1916, an increase of 6.4 tons per car. This increase in average loading represents a saving of 46,622 cars for the month.

H. E. Byram, vice-president, in charge of operation, in commenting upon the figures says that "the increase in car efficiency has not been due entirely to the efforts of the Burlington's management and its employees, but a large part of the credit for the increased loading of cars is due to the co-operation on the part of the shippers along the line. To a remarkable degree our shippers have exhibited a sense of appreciation of what the Burlington, in common with other systems, is attempting to do in furnishing the greatest possible volume of transportation with the amount of equipment that is available. The practical effect of this co-operation is clearly shown by the large number of cars made available for other purposes as a result of loading cars more nearly to capacity."

This same spirit of co-operation appears to have developed generally in the last few months throughout the United States, though not always to the same extent as shown by the Burlington's record. Reports from roads having a mileage of 173,000 miles, and handling about 80 per cent of the total traffic, show an average of 25.8 tons per loaded car in May, 1916, and of 27.2 tons in May, 1917, an increase of 1.4 tons per car, or 5.4 per cent. In the eastern and southern districts the average increase for the same period was 1.5 tons, or 5.5 per cent, and in the western district there was the same increase in tons per car, but the per cent of increase was 6.4. Many individual roads in central territory have made good records in April, 1917, compared with April, 1916. The Chicago & Eastern Illinois increased its tonnage per loaded car from 25.5 tons to 31.4 tons, or 23.1 per cent; the Lake Erie & Western from 18.7 tons to 23.6 tons, or 26 per cent; the Chicago & Alton from 21.6 tons to 26.3 tons, or 21.8 per cent; the Chicago & Erie from 23.3 tons to 26.2 tons, or 12.4 per cent; the Atchison, Topeka & Santa Fe from 19 tons to 21.3 tons, or 12.1 per cent.

It is evident that the spirit of co-operation on the part of the railroads and shippers, which has been so strongly urged by the Railroad's War Board, is producing a beneficial effect in securing the loading of cars to capacity, and thereby accomplishing the same results that would follow the placing of many thousands of additional cars in service, without the additional congestion that more cars in service might produce.

Efforts to Increase Coal Shipments to Northwest

Representatives of coal operators, all dock companies on Lake Michigan and Lake Superior, the railroads, and the Interstate Commerce Commission held a conference at Washington on August 14, at the call of F. S. Peabody, chairman of the committee on coal production of the Council of National Defense, to consider ways of meeting the urgent necessity of increasing shipments of coal via the lakes to the northwest. It was estimated that it would be necessary to ship a total of 29,000,000 tons of soft coal from Lake Erie ports during the season of navigation, whereas only 12,000,000 tons had been moved up to August 11, leaving 17,000,000 tons to be shipped in the 16 weeks remaining before navigation closes, or an average of 1,062,000 tons a week. Shipments to date have averaged only 940,000 tons a week.

After an all day discussion as to the reasons for the condition, and as to how the situation could be remedied in order to avoid a fuel famine this winter, resolutions were adopted expressing the sense of the meeting that unless peremptory orders are issued from some authoritative source to all coal operators in the Pittsburgh, Fairmont and No. 8, Ohio, districts that they must ship 50 per cent of the cars (except cars for railroad fuel) furnished to their mines daily to Lake Erie ports for transshipment to the northwest until further notice, or until the present emergency is met, the situation in the northwest next winter will amount to a calamity. This resolution was referred to

Daniel Willard, chairman of the advisory commission of the Council of National Defense; the members of the Division of Car Service of the Interstate Commerce Commission, and C. M. Scheaffer, chairman of the Commission on Car Service, who were present, to attempt to secure the necessary authority. It was the thought of those present that a priority order to be issued under the authority given to the President in the priority bill, which has just become a law, would meet the situation. The resolution also suggested that the method of car distribution now applied to railroad fuel coal should be adopted.

There was considerable discussion as to whether the reason for the shortage of shipments to the northwest was caused by car shortage or by a preference on the part of coal operators to ship elsewhere. It was stated that railroad shipments placed in vessels on Lake Erie ports up to August 1 of this year had amounted to about 11,000,000 tons, as compared with 13,000,000 tons for the same period last year, the shortage being caused by the fact that the season of navigation began late this year. It was also shown that a considerable amount of coal had been shipped into Canada. The Railroads' War Board had recently requested the coal operators to use 50 per cent of their car supply for shipments to the lake ports, but this measure had proved ineffective because there was no authority to enforce the request on the shippers. It was declared that the situation in the northwest presents the most immediate pressing necessity, and should be given first consideration because other districts may be taken care of after the season of navigation by rail shipments. The New England situation was to be taken up at a similar meeting later.

Signal Appliance Association Meeting

It has been the practice for years to hold the annual meeting of the Signal Appliance Association at the same time and place as the annual meeting of the Railway Signal Association, but in order to co-operate fully with the latter body this year, the annual meeting was held at the Hotel McAlpin, New York, N. Y., on August 10. The R. S. A. annual meeting at Atlantic City next month will, on account of war conditions, be confined to a two days' business session, all forms of entertainment having been eliminated.

Secretary-Treasurer Edmunds reported an active membership of 52 companies; and that the association purchased last June a \$1,000 Liberty bond. Further action was taken authorizing the purchase of an additional \$500 bond in the next Liberty Loan.

At the meeting a resolution relating to official attendance was offered and unanimously adopted, to the effect that "this association shall have no official representation at Atlantic City during the time of the annual meeting of the Railway Signal Association, September 18 and 19, 1917."

While this resolution refers to "official representation" only, the spirit and practice of that resolution rightfully construed should prevent all attendance by railway supply men on their own individual responsibility. It is certain that none of the many representatives interviewed by this publication will attend the convention. The only justification for any representative is for those engineers who have been actively participating in committee discussions be on hand to discuss the subject when it is presented on the floor of the convention. The Signal Appliance Association expressly desired the full co-operation of its members in this respect.

The new officers of the association are: W. T. Kyle, Page Woven Wire Fence Company, chairman; George C. Isbester, Rail Joint Company, vice-chairman; F. W. Edmunds, Dressel Railway Lamp Works, secretary-treasurer. Mr. Isbester was continued as vice-chairman this year on account of his now being the paymaster in the United States Army. New members of the executive committee are: Sidney Johnson, General Railway Signal Company; H. G. Thompson, Edison Storage Battery Company; A. S. Anderson, Adams & Westlake Company; and C. F. Massey, C. F. Massey & Co.

Chairman Kyle has appointed the following arrangement committee: J. Warren Young, chairman, Kerite Insulated Wire & Cable Company; J. W. White, General Railway Signal Company; J. F. Lepreau, Thomas A. Edison, Inc.; A. S. Anderson, Adams & Westlake Company; W. R. Young, General Railway Signal Company. Place committee: Henry Lee, chairman, Railway Signal Engineer, and G. A. Blackmore, Union Switch & Signal Company.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. It is published only in the first issue of the Railway Age Gazette for each month.

- AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Next meeting, October 16-17, St. Louis.
- AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lighty, C. & N. W., Chicago. Next convention, October 16-18, 1917, Chicago.
- AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.
- ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—E. R. Woodson, Rooms 1116-8 Woodward Bldg., Washington, D. C. Next meeting, September 26, Congress Hotel, Chicago.
- ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—W. L. Connelly, Supt. of Telegraph, Indiana Harbor Belt, Gibson, Ind. Next annual meeting to have been held September 18, 1917, Washington, D. C., indefinitely postponed.
- CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.
- CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.
- CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.
- CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.
- CHIEF INTERCHANGING CAR INSPECTORS AND CAR FOREMEN'S ASSOCIATION.—W. R. McDunn, New York Central, Albany, N. Y. Next convention, September, 1917, St. Louis.
- CINCINNATI RAILWAY CLUB.—H. Boutet, Chief Interchange Inspector, C'n'ty Rys., 101 Carey Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.
- ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 568 Union Arcade Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.
- GENERAL SUPERINTENDENTS OF CHICAGO.—A. M. Hanter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.
- INVESTMENT BANKERS' ASSOCIATION OF AMERICA.—Frederick R. Fenton, 11 W. Monroe St., Chicago. Annual convention, October 1-3, 1917, Baltimore, Md.
- MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—F. W. Harget, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 16-18, 1917, Cleveland, Ohio.
- MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—A. P. Dane, B. & M., Reading, Mass. Next annual meeting, September 11, Chicago.
- NATIONAL ASSOCIATION OF RAILWAY COMMISSIONERS.—Jas. B. Walker, 120 Broadway, New York City. Next annual convention, October 16, 1917, Washington, D. C.
- NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August, September, Boston.
- NEW YORK RAILROAD CLUB.—Hart D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.
- NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Geo. A. J. Hochrehe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.
- PACIFIC RAILWAY CLUB.—W. S. Wolfner, Assistant to Chief Engineer, Northwestern Pacific R. R., San Francisco, Cal.
- PEORIA ASSOCIATION OF RAILROAD OFFICERS.—C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.
- RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.
- RAILWAY CLUB OF PITTSBURGH.—J. R. Anderson, Room 207, P. R. R. Bldg., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial Annex Hotel, Pittsburgh.
- RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, office of the president's assistant, Seaboard Air Line, Norfolk, Va. Next meeting, October 2-4, 1917, St. Louis, Mo.
- RAILWAY REAL ESTATE ASSOCIATION.—R. H. Morrison, Assistant Engineer, C. & O., Richmond, Va. Next convention, October, 1917, Duluth, Minn.
- RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next annual convention, September 18-19, 1917, Hotel Traymore, Atlantic City, N. J.
- RICHMOND RAILROAD CLUB.—P. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.
- ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W., 400 Building, Ill. Next annual convention, September 18-21, 1917, Hotel Auditorium, Chicago.
- ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.
- SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.
- SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 m. Piedmont Hotel, Atlanta.
- TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.
- TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 201 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.
- TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Gen'l Mgt. Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings bi-monthly, Pittsburgh.
- UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1114 Newhouse Bldg., Salt Lake City. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.
- WESTERN CANADA RAILWAY CLUB.—I. Koo, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.
- WESTERN RAILROAD CLUB.—W. T. Wynn, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

MONTHS OF CALENDAR YEAR, 1917

INCOMES AND EXPENSES OF RAILWAYS

Name of road.	Average mileage operated during period.	Operating revenues—			Maintenance of—		Operating expenses—			Net railway operation.	Railway tax accs.	Operating income (or loss).	Increase comp. with last year.
		Freight.	Passenger.	Total.	Way and structures.	Equip-ment.	Traffic.	Trans- portation.	Miscel- laneous.					General.	Total.
Lehigh & Hudson River.....	96	\$89,128	\$2,274	\$1,106,796	\$161,762	\$161,762	35,141	\$123,612	\$29,033	\$730,344	\$376,029	\$342,428	\$45,628
Lehigh Valley.....	1,443	2,155,290	2,111,888	4,267,178	2,846,582	4,556,762	503,161	1,146,061	891	46,716	4,267,178	4,267,178	—
Long Island.....	397	2,111,669	4,011,333	7,063,908	3,938,564	862,193	697,356	1,996,763	56,924	148,469	1,617,740	1,170,144	446,596
Los Angeles & Salt Lake.....	1,154	4,113,769	1,641,127	5,754,896	698,334	899,112	197,356	3,796,948	123,952	3,745,668	2,503,473	1,170,144	184,497
Louisiana & Arkansas.....	302	324,106	106,622	695,410	131,466	122,941	23,335	223,906	26,218	327,495	167,915	106,855	—
Louisiana Western.....	208	1,120,374	424,663	1,654,041	144,948	201,438	47,728	374,128	11,559	41,814	222,530	106,385	—
Louisiana, Henderson & St. Louis.....	199	777,765	210,146	1,031,117	133,711	125,877	29,230	343,133	21,576	650,630	386,588	104,494	—
Maine Central.....	1,216	4,630,151	1,633,939	6,264,090	743,338	953,879	69,002	3,413,331	11,352	169,028	5,066,013	1,406,215	—
Michigan Central.....	1,862	16,588,518	5,517,376	24,105,894	2,734,601	3,792,243	399,096	11,266,187	382,469	484,320	19,055,819	5,588,808	—
Minneapolis & St. Louis.....	1,697	3,923,247	863,072	4,786,319	448,921	545,921	102,535	2,452,346	512	30,137	3,001,019	1,536,479	—
Minneapolis, St. Paul & St. Marie.....	4,238	11,693,665	3,007,839	16,701,507	1,721,247	2,309,601	297,104	5,980,307	100,121	390,078	10,749,639	5,251,361	—
Missouri & North Arkansas.....	365	443,365	68,000	511,365	123,208	107,224	23,776	261,074	959	31,311	543,341	109,034	—
Missouri, Kansas & Texas System.....	3,865	13,693,813	4,471,772	19,630,705	3,629,036	3,767,008	397,856	7,316,781	135,268	608,913	15,834,483	3,776,222	—
Missouri, Kansas & Texas.....	1,132	5,749,339	1,243,349	6,992,688	1,010,416	1,291,016	256,338	3,457,511	1,1205	44,391	7,770,318	1,440,656	—
Missouri & Oklahoma.....	1,168	5,057,216	66,218	5,719,434	690,800	1,047,016	236,338	3,457,511	1,1205	44,391	7,770,318	1,440,656	—
Monongahela Connecting.....	6	.....	66,218	1,087,999	178,046	82,943	5,273	294,662	15,334	24,544	4,855,573	462,305	—
Monongahela.....	168	5,057,216	66,218	5,719,434	690,800	1,047,016	236,338	3,457,511	1,1205	44,391	7,770,318	1,440,656	—
Morgan's L. & Tex. R. & St. Co.....	401	2,273,325	680,999	3,166,134	327,281	463,345	72,295	915,897	18,022	75,890	1,867,323	1,108,767	—
Nashville, Chattanooga & St. Louis.....	1,237	4,090,199	1,495,410	7,115,567	1,217,283	1,737,679	333,271	1,112,882	14,852	216,991	1,679,661	1,007,962	—
Nashville, Chattanooga & St. Louis.....	1,237	4,090,199	1,495,410	7,115,567	1,217,283	1,737,679	333,271	1,112,882	14,852	216,991	1,679,661	1,007,962	—
New Orleans, Texas & Northern.....	285	1,624,845	160,935	2,833,629	83,710	141,004	18,738	256,948	30,711	4,070	2,714,940	928,639	—
New Orleans, Texas & Northern.....	285	1,624,845	160,935	2,833,629	83,710	141,004	18,738	256,948	30,711	4,070	2,714,940	928,639	—
New Orleans, Texas & Northern.....	285	1,624,845	160,935	2,833,629	83,710	141,004	18,738	256,948	30,711	4,070	2,714,940	928,639	—
New Orleans, Texas & Northern.....	285	1,624,845	160,935	2,833,629	83,710	141,004	18,738	256,948	30,711	4,070	2,714,940	928,639	—
New York, Chicago & St. Louis.....	571	7,225,995	609,448	8,186,499	677,288	1,219,658	270,762	4,096,553	28,734	199,996	6,491,509	1,695,193	—
New York, New Haven & Hartford.....	1,207	2,000,163	154,461	4,114,678	3,885,568	4,645,462	259,023	8,786,110	611,939	175,178	29,955,579	1,033,698	—
New York, New Haven & Hartford.....	1,207	2,000,163	154,461	4,114,678	3,885,568	4,645,462	259,023	8,786,110	611,939	175,178	29,955,579	1,033,698	—
New York, Philadelphia & Norfolk.....	112	1,270,129	290,569	2,447,079	778,586	483,101	28,340	1,934,595	35,239	71,455	3,180,564	488,215	—
New York, Philadelphia & Norfolk.....	112	1,270,129	290,569	2,447,079	778,586	483,101	28,340	1,934,595	35,239	71,455	3,180,564	488,215	—
New York, Susquehanna & Western.....	135	1,270,129	290,569	2,447,079	778,586	483,101	28,340	1,934,595	35,239	71,455	3,180,564	488,215	—
Norfolk & Western.....	2,085	26,890,758	2,800,675	36,494,435	4,448,516	7,040,534	391,323	14,515,599	61,442	575,287	91,223,838	11,678,101	—
Norfolk Southern.....	908	2,008,111	524,248	2,691,507	339,710	408,888	52,370	892,409	557	120,426	1,811,310	880,197	—
Norfolk Southern.....	908	2,008,111	524,248	2,691,507	339,710	408,888	52,370	892,409	557	120,426	1,811,310	880,197	—
Northwestern Pacific.....	507	3,081,983	679,313	5,065,734	5,075,424	6,245,244	624,753	13,766,754	1,168	765,492	25,015,266	1,733,058	—
Panhandle & Santa Fe.....	670	2,623,113	511,777	3,266,383	479,101	570,169	27,770	906,729	30,711	39,077	4,621,339	38,400	—
Pennsylvania Company.....	1,734	26,364,488	2,959,376	36,494,435	4,448,516	7,040,534	391,323	14,515,599	61,442	575,287	91,223,838	11,678,101	—
Pennsylvania Railroad.....	4,536	86,076,695	23,571,459	15,214,345	2,959,526	3,291,412	311,097	16,827,518	1,934,305	936,631	96,106,119	26,465,340	—
Pennsylvania Railroad.....	4,536	86,076,695	23,571,459	15,214,345	2,959,526	3,291,412	311,097	16,827,518	1,934,305	936,631	96,106,119	26,465,340	—
Perry & Pekin Union.....	236	4,502,145	95,342	6,171,816	670,742	832,959	119,303	3,742,647	1,197	20,107	5,522,628	48,288	—
Philadelphia, Baltimore & Washington.....	718	7,247,117	591,861	14,606,517	1,908,194	2,888,667	174,431	6,267,580	11,937	352,399	11,574,268	3,034,336	—
Pittsburgh & Lake Erie.....	234	9,660,505	630,433	13,411,653	1,441,935	2,241,935	95,793	13,776,151	30,187	225,499	7,922,996	3,931,657	—
Pittsburgh, Cincinnati, Chic. & St. L.....	2,399	25,291,380	6,305,823	35,654,763	3,908,235	7,231,680	596,635	14,557,101	294,202	866,695	27,344,305	8,230,458	—
Pittsburgh, Cincinnati, Chic. & St. L.....	2,399	25,291,380	6,305,823	35,654,763	3,908,235	7,231,680	596,635	14,557,101	294,202	866,695	27,344,305	8,230,458	—
Richmond, Fredericksburg & Potomac.....	488	1,235,660	55,703	2,374,741	192,641	244,963	23,835	787,312	26,994	50,991	1,333,535	1,050,806	—
St. Joseph & Grand Island.....	258	1,978,868	141,596	1,193,888	399,315	133,321	22,665	418,933	31,959	3,150	1,010,372	184,972	—
St. Louis, Brownville & Mexico.....	548	1,113,805	731,754	1,984,921	297,332	334,316	60,774	580,982	.....	64,161	212,996	767,091	—
St. Louis, Merchant's Bridge Terminal.....	9	.....	3,398	1,492,942	177,179	810,338	.....	773,920	.....	46,798	1,664,439	408,301	—
St. Louis, San Francisco & Texas.....	199	37,407	1,564,332	10,870	104,275	104,275	13,733	277,812	.....	37,033	356,263	32,090	—
St. Louis, San Francisco & Texas.....	199	37,407	1,564,332	10,870	104,275	104,275	13,733	277,812	.....	37,033	356,263	32,090	—
Seaboard.....	3,461	3,211,044	3,277,018	15,036,330	1,594,356	2,326,988	48,377	5,595,737	115,301	41,377	10,732,793	4,445,665	—
Southern.....	6,983	28,442,629	9,444,789	41,554,555	4,467,043	118,739	1,027,085	14,914,700	298,477	1,109,167	27,942,159	13,511,963	—
Southern.....	6,983	28,442,629	9,444,789	41,554,555	4,467,043	118,739	1,027,085	14,914,700	298,477	1,109,167	27,942,159	13,511,963	—
Southern Pacific.....	7,029	45,322,215	15,311,371	66,361,427	6,655,428	9,072,791	1,075,500	23,322,069	1,028,829	1,633,772	42,802,448	23,558,719	—
Southern Pacific.....	7,029	45,322,215	15,311,371	66,361,427	6,655,428	9,072,791	1,075,500	23,322,069	1,028,829	1,633,772	42,802,448	23,558,719	—
Tennessee Central.....	254	2,180,047	335,268	3,358,268	468,568	574,305	55,733	705,776	26,874	81,330	1,480,937	1,635,387	—
Terminal R. R. Ass'n. of St. Louis.....	36	.....	5,631	1,020,076	197,263	108,914	.....	579,393	.....	38,256	667,214	182,193	—
Texas & New Orleans.....	468	2,682,487	65,967	2,980,580	280,955	483,186	64,071	404,686	66,633	38,256	1,892,962	1,082,611	—
Texas & Pacific.....	1,947	7,058,379	2,741,194	10,544,235	1,169,985	1,306,395	240,480	4,367,242	73,381	349,119	7,482,049	3,061,185	—
Toledo, Ohio & Western.....	2,735	2,938,718	2,000,888	3,409,183	1,510,837	676,303	43,292	4,367,242	73,381	349,119	7,482,049	3,061,185	—
Toledo, St. Louis & Western.....	455	2,949,905	185,027	3,912,742	1,333,572	1,626,296	104,321	2,493,306	10,513	30,246	2,785,575	623,428	—
Trinity & Brazos Valley.....	363	365,579	57,851	463,742	148,794	210,995	16,387	142,900	.....	40,487	572,070	55,306	—
Union R. R. of Baltimore.....	8	823,267	194,918	1,033,629	53,248	87,844	.....	421,169	.....	13,573	108,979	924,650	—
Union R. R. of Pennsylvania.....	35	.....	35,661	2,634,851	255,148	878,244	.....	761	1,399,008	.....	34,244	668,634	—
Virginian, Shenandoah & Pacific.....	117	.....	105,165	97,9082	106,539	182,307	28,722	1,313,119	10,542	34,344	2,566,853	67,998	—
Washington.....	2,519	4,158,588	229,751	5,090,189	1,062,539	1,823,307	.....	2,739,372	.....	37,033	3,562,633	3,040,448	—
Washington Southern.....	36	140,771	3,420,011	19,283,108	1,864,360	2,521,499	559,037	8,024,691	11,498	22,853	6,275,799	558,994	—
West Jersey & Seashore.....	359	1,297,336	1,936,422	3,338,465	705,542	574,044	65,590	1,649,663	23,341	108,381	3,124,849	513,671	—
Western Maryland.....	275	541,536	479,790	6,318,958	71,334	120,563	.....	130,783	2,990,664	7,748	2,706,697	1,719,291	—
Western Ry. of Alabama.....	133	311,973	55,769	4,441,406	696,665	438,499	121,697	1,299,037	66,084	1,200,762	4,599,166	1,740,220	—
Wheeling & Lake Erie.....	512	3,680,190	470,829	5,953,343	730,640	1,166	49,402	1,736,240	10,166	115,065	3,343,464	1,907,660	—
Yazoo & Mississippi Valley.....	1,382	1,880,234	1,484,710	1,815,719	1,434,812	1,342,050	128,817	2,702,665	14,130	214,152	5,808,476	623,849	—

Traffic News

In order to prevent a threatened fuel famine in Utah and Idaho, the railroads entering Utah have agreed to divert cars to the coal mines.

The receivers of the Tennessee Central announce that on request of the War Board they have discontinued the operation of four week-day passenger trains, making a reduction of 180 train miles per day.

A joint session of the public utilities boards of Ohio, Illinois and Indiana has been called for August 23, at Indianapolis, Ind., to consider the request of the railroads for an increase of 15 cents a ton in intrastate rates on coal and coke.

The New York Central has withdrawn passenger tariffs filed with the New York Public Service Commission, proposing increases in rates between points in New York state. As noted in last week's issue, the commission for the first district suspended the tariffs from September 1 to September 20, and had planned to hold hearings on August 15.

The State Railroad Commission of Iowa has announced that the hearing of the shippers' side of the railroad petition for a 15 per cent increase in the intrastate freight rate on coal and coal products will be held on Tuesday, August 14, at Des Moines, Iowa. The case of the railroads petitioning for the increase was heard by the commission on August 2. All roads operating in Iowa were represented at the hearing.

Bryan Snyder, receiver of the Marshall & East Texas, announces that after August 14 that road will accept no freight or passengers for transportation over that portion of the line from West Marshall, Tex., westward to Winnboro, 72 miles. This action is taken pursuant to a decree of the United States District Court issued July 17. This order leaves in operation that portion of the road from West Marshall, eastward, 19 miles, to Elysian Fields.

The State Railroad and Warehouse Commission of Minnesota has undertaken a special inquiry into the freight car situation, with a view to sending out a special appeal to railroads and shippers, and attempting to avert shortages as much as possible. The commission points out that there are indications that the federal officials will use the government authority to designate car preferences for the prompt movement of military equipment, grain and other similar shipments, and that such a condition will aggravate the present situation.

The Pere Marquette, in order to promote the conservation of cars and to expedite the handling of l. c. l. business, has adopted a "sailing-day" plan at Chicago, to go into effect on August 15. The schedule of the company is as follows: Mondays and Thursdays, Big Rapids, Mich.; Harbor Beach, Lake View, Midland, Manistee, Mt. Pleasant and Newaygo; Tuesdays and Fridays, Elkton, Freepoint, Ionia, Lake Odessa, Sparta, White Cloud and Laporte; Wednesdays and Saturdays, Belding, Toledo, Baldwin, Saginaw, Weidman, Portland and Alma. The road will continue daily l. c. l. service to Grand Rapids, Flint, North Flint and Detroit.

A conference between the Chicago sub-committee of the Railroads' War Board and the Chicago regional committee of the National Industrial Traffic League, was held at Chicago on August 10. H. E. Byram, vice-president of the Burlington, is chairman of the sub-committee, and C. I. Forsyth is vice-chairman. F. B. Montgomery, vice-president of the International Harvester Company, is chairman of the Chicago regional committee of the National Industrial Traffic League, and Robert C. Ross, traffic manager of the Ryerson Company, is vice-chairman. The league committee represents all the large shipping interests of the Chicago district. Plans were adopted at the meeting for complete co-operation between the railways and the shipping interests, and the committee aims to secure the utmost efficiency in the use of railway equipment moving within, into and out of the Chicago district.

The Chicago sub-committee of the War Board will meet every Tuesday morning, and an arrangement has been made under which the regional committee of the National Industrial Traffic League will always have representatives to meet with it. The

committee of the Industrial Traffic League will meet regularly probably once every fortnight, and these meetings will be attended by representatives of the railroads. The subjects discussed at the last meeting were those of earlier closing of freight houses; sailing-days for package freight cars; the pooling of box cars in the Chicago switching district and increases in the minimum weight of trap and ferry cars. No action was taken on any of these subjects, but they will be taken up for definite action at later conferences.

"Buy an Upper Berth—You'll Like It"

Western roads have adopted this slogan as a war measure intended to avoid the necessity of hauling two half loaded cars instead of one filled to capacity. The lines point out that necessity demands the full use of every bit of railroad equipment in the country, and that the upper berth is just as desirable; in fact more so than the lower. The arguments put forward in favor of using an upper, are that the upper berth is 20 per cent less expensive, the ventilation is excellent, the berth is further removed from the noise of the wheels, and he is out of the way of people moving up and down the aisles. The Pullman Company is supplying new upper steps and individual curtains, which are designed to make the upper berth more attractive.

Louisiana Roads Ordered to Increase Equipment

By an order of the Louisiana Railroad Commission dated July 26 the railroads of Louisiana must secure additional open top cars for shippers in that state.

On March 21, on account of numerous complaints, the commission declared that in its opinion, the railroads of the state were not furnishing sufficient freight equipment to handle the traffic properly and promptly at all seasons of the year, and decided to enter into an investigation. In accordance with the terms of the order a full investigation was made at a session at Baton Rouge, La., on July 16 and 19. It developed at this hearing that the shippers of the state were undergoing severe hardships, and that large industries were about to close on account of the failure to receive proper equipment for transporting their products. The commission decided that in its opinion arrangements can be made by the carriers to place in service more equipment in the shape of open top cars, and that this should be done without delay. By the order of the commission the Texas & Pacific, Morgan's Louisiana & Texas, the New Orleans, Texas & Mexico, the Missouri Pacific and the Louisiana Western, must each secure within 90 days from the date of the order 200 additional open top cars to be placed in service for the transportation of intrastate freight. The Chicago, Rock Island & Pacific, the Louisiana & Arkansas, and the Vicksburg, Shreveport & Pacific, must in the same period secure 100 additional open top cars each.

Car Shortage Again Reduced

Reports just received by the Railroads' War Board show that the railroads of the country, in their co-operative efforts to give to the country the greatest possible amount of freight service, have effected an extraordinary improvement in freight car supply. The excess of unfilled car requisitions over idle cars, or what is ordinarily but inaccurately termed "car shortage," was less than one-fourth as great on August 1, 1917, as on May 1, 1917. The excess of unfilled car requisitions on May 1 was 148,627; on June 1 it was 106,649; on July 1 it was 77,682, and on August 1 it had been reduced to 33,776.

This result has been accomplished at a time when the railroads are supplying from 15 to 20 per cent more freight service with the same number of cars than was being given this time last year, for the railroads handled in July a tremendous increase in both government and commercial traffic. The movement of cantonment supplies alone occupied the full services of more than 30,000 cars. There was also an extraordinarily heavy demand for cars to transport food products, as well as materials to and from munition factories.

"The result above achieved has been accomplished by co-operation with the railroads of shippers, regulating bodies and the public generally," says Chairman Harrison of the Railroad War Board. "This co-operation has made possible the intensive loading of freight cars, prompt unloading, the elimination of a large amount of unnecessary passenger train service, and an opportunity generally to utilize the railroad plant efficiently.

The aim of the railroads at the present time is to put each car to the greatest possible use, to have empty cars placed where they are most needed, to prevent over-lapping and unnecessary service—in other words, to make the entire railroad system of the United States the most effective possible transportation agency in winning this war."

New Haven Embargo Distinguishes Between Cars Loaded to Capacity

The New York, New Haven & Hartford on Friday last put into effect an extensive embargo on carload freight for New England from connecting railway carriers via all junction points, from coastwise steamship lines via Harlem river, New York, piers 31 to 70 East river, New York, Brooklyn terminals and lighter service, except the following freight when loaded to the "marked carrying or practical carrying capacity of the car" consigned to stations on its own lines:

"Perishable and live stock, foodstuffs for human consumption, food for live stock, news and book print paper, copper, spelter, zinc, lead, crucible, billets, insect repellents, vermin exterminators, fungicides, tree and other agricultural spray material, baskets, barrels and fruit containers for shipping fruit and produce, coal, coke, hemp, sisal, tin cans, glass containers, materials and supplies for the New York, New Haven & Hartford, Central New England and Boston & Maine."

Embargo is also placed on less than carload freight except perishables. The embargo also excepts shipments for the United States or the allied governments or for the Red Cross.

Roads in Central Department Plan Further Reduction in Passenger Service

Extensive reductions in passenger train service in addition to those already made are soon to go into effect in the Central territory. According to a report made by R. H. Aishton, president of the Chicago & North Western, and chairman of the Central Department Committee, the railroads in this territory have effected a saving at the rate of almost 7,000,000 passenger miles a year in passenger train service between March 1 and July 15. The total reductions already made, and those which will soon be put into effect in this territory amount to over 12,000,000 passenger miles. This is in addition to reductions of over 16,000,000 passenger miles previously reported in eastern territory. The states included in the Central Department are Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, West Virginia, Wisconsin and Colorado. The reductions already made will effect the saving of approximately 500,000 tons of coal a year, which, by this reduction, is made available for other purposes, and the further reduction to be made will bring the amount of the saving up to about 840,000 tons.

Of the roads which, by reason of the extent of their service, have been enabled to contribute most largely to this result in the Central territory are the Pennsylvania, 835,756 passenger miles; Cleveland, Cincinnati, Chicago & St. Louis, 779,560; Chesapeake & Ohio, 725,510; Baltimore & Ohio, 601,987; Missouri, Kansas & Texas, 580,206; Pere Marquette, 574,629; Erie, 325,782; Chicago, St. Paul, Minneapolis & Omaha, 310,048; and Chicago, Rock Island & Pacific, 298,006. Several of the roads which have up to the present time made only small reductions in passenger service are contemplating larger reductions to take place in the immediate future. These include the Chicago, Burlington & Quincy, 1,800,000 passenger miles; the Chicago, Rock Island & Pacific, 886,456; the Missouri Pacific, 1,000,000; and the Missouri, Kansas & Texas, 598,822. The Chicago & Eastern Illinois, the Grand Rapids & Indiana, the Kansas City Southern, the Lake Erie & Western, the Michigan Central and the Minneapolis, St. Paul & Sault Ste. Marie, several of which have already made considerable reductions, are planning further reductions amounting to from 130,000 to 200,000 passenger miles each. The total amount of additional reduction already planned amount to 5,539,561 passenger miles, making a total of 12,227,963 passenger miles for the railways of the Central Department. The whole matter of curtailment of passenger train service has been carefully worked out by the committee and the railroads, and most of the further reductions are expected to be brought about by lengthening the schedule of transcontinental trains, and the effect will therefore be felt locally only to a small extent.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The commission has made public the tentative report of Attorney-Examiner Watkins in the case involving the adjustment of class rates in the southwest resulting from a general readjustment, including many advances made by the railroads in rates to bring them into conformity with the rates in Texas allowed by the Interstate Commerce Commission in the Shreveport rate case, in place of rates formerly made by the Texas Railroad Commission, which the carriers asserted had unduly reduced rates to points outside of Texas. The tentative report finds that the proposed increases in class rates between points in Texas and points in Oklahoma between Shreveport, La., and certain points in Oklahoma on interstate traffic between points in Oklahoma and between points in Kansas and the Panhandle of Texas are not justified. It is also recommended that the tariffs now under suspension until December 1 shall be ordered cancelled without prejudice to the filing of tariffs to conform with the findings of the report.

Conference Rulings

The commission has adopted the following conference rulings:

"That employees of common carriers who enter the military or naval service of the United States in the present war, and who are carried on the records of the carrier as furloughed employees, to be restored to the carrier's service at the termination of the war, are furloughed employees within the meaning of section 1 of the act to regulate commerce, and that the carriers may lawfully grant free passes to dependent members of their families."

"A carrier may not lawfully build a switch track inside the plant boundary of an industrial company without adequate compensation therefor. And an agreement by the industry to give the carrier all or a part of its traffic as compensation for the building of the track is not regarded as 'adequate compensation.'"

"That the act to regulate commerce, as amended, does not authorize an express company subject to the act to carry property either for its own officers or employees or for the officers and employees of other common carriers except at its legally published rates."

STATE COMMISSIONS

The New York Public Service Commission, First district, has refused permission to the Long Island to put into effect an increase in its mileage book rates from \$10 to \$11.25 for a 500-mile book, pending the decision of the commission upon a number of rate increases proposed by the company, and now under consideration by the commission. The new rate has been allowed by the commission for the Second district to apply outside of New York City, but the commission for the First district objected to the railroad's putting the new rate into effect in New York City. The railroad protested against having to sell separate mileage books for use wholly in New York City, and the present decision is not final.

COURT NEWS

Expense of Transportation

A trunk line railroad, the Illinois Central, entered into a contract with a tap line railroad, the Kentwood & Eastern, whereby the K. & E. should receive part of the freight rate paid on lumber made from logs brought over the tap line and transported by the trunk line into a designated territory. The trunk line entered into a contract for the purchase of lumber from a lumber company whose mill was situated at the point of intersection of the trunk line and the tap line. Logs out of which lumber was made were hauled over the tap line, and the trunk line, on carrying such lumber into the designated territory, made the required payment to the tap line company, which amounts were in turn paid to the lumber company. The lumber company sold the lumber f. o. b. at the intersection point. In an action by the

trunk line company against the lumber company and the tap line company, the Circuit Court of Appeals, Fifth Circuit, held that though the trunk line, by reason of the diversity of its business and multiplicity of departments, did not immediately discover the situation, it was (the lumber company having agreed to deliver the lumber *f. o. b.* at the point of intersection) entitled to repayment of the sums paid the tap line company, for otherwise the lumber company would escape payment of a large portion of the freight on the logs to the point of intersection.—*Illinois Central v. Brooks-Scanlon Co.*, 241 Fed., 445. Decided April 11, 1917.

Carriage of Alcohol

A druggist by an action of detinue sought to obtain from a railroad possession of a shipment of alcohol to carry it to his place of business, where he was engaged in the sale of beverages, to keep and use it there in the manufacture of extracts in violation of the Alabama statute. The Alabama Court of Appeals holds that the railroad could not deliver the alcohol to the plaintiff without violating the criminal law, nor could the plaintiff accept delivery without a like result, so that the plaintiff, not being entitled to immediate delivery, was not entitled to recover in detinue.—*L. & N. v. Parish (Ala.)*, 75 So., 638. Decided May 29, 1917.

Freight Rates—Routing

The Minnesota Supreme Court holds that a carrier, in the absence of shipping instructions, is not bound to route shipments on an intrastate line to secure a lower rate for a shipper, where an easier grade and a shorter distance call for an interstate route, though as to a car which by mistake was routed on an intrastate line, it would be required to refund under the Minnesota maximum freight rate statute of 1913. In this case, not only the easier grade and shorter distance called for the interstate route, but the intrastate route would have involved a back haul of 15 miles, which, it was held, could not in reason be demanded.—*Comstock F. El. Co. v. Great Northern (Minn.)*, 163 N. W., 280. Decided June 22, 1917.

Insufficient Evidence of Negligence in Handling Live Stock

In an action against a railroad for damages to horses and mules resulting from alleged negligence in handling a carload of them, the evidence showed that the animals were not physically injured, but were in apparently good condition when delivered to the consignee, that in stockyards from which the animals were shipped a contagious disease similar to that contracted by them was discovered before they were put there, that live stock shipped from North to South in that season frequently suffer from shipping cold, and that several days after the plaintiff received them several animals developed colds, followed by pneumonia and died; but it was not shown that this condition resulted from the railroad's negligence. The Mississippi Supreme Court holds that a verdict for the plaintiff was wrong, and judgment for the plaintiff was reversed and the case dismissed.—*Illinois Central v. Ainsworth (Miss.)*, 75 So., 755. Decided June 25, 1917.

Order to Construct New Station Held Unreasonable

The Missouri Supreme Court holds unreasonable and unlawful an order of the Public Service Commission requiring the Wabash to construct a new passenger station at Macon for the following reasons: The evidence did not tend to prove any defect or inadequacy which could not be corrected by repairs, improvements and enlargement of the existing depot. There was no evidence that it was physically impossible or even difficult to make the changes necessary to meet the objections made to the existing structure. It did not appear that there was any legal obstacle to the changes proposed. There was no evidence tending to show that the company's right of way was too narrow to accommodate the improvements desired and necessary, or that the enlargement of the building and widening of the platform would in any way infringe on any street or interfere with any other property.—*State ex rel. Wabash v. Public Service Commission (Mo.)*, 196 S. W., 369. Decided June 1, 1917.

Construction of Safety Appliance Acts

The Louisiana Supreme Court holds that the federal Safety Appliance Acts absolutely require handholds above footboards, and railroads will not be permitted to substitute for them uncoupling or operative levers. The acts embrace all locomotives, cars and similar vehicles used on any railroad which is a highway of interstate commerce.—*Lenree v. Texas & Pacific (La.)*, 73 So., 676. Decided June 11, 1917.

Assumption of Risk by Employees on Tracks

The Kentucky Court of Appeals holds that employees of a railroad in the habit of using the company's tracks in coming to and going from its offices in doing their work, assume the risk of injury from passing trains. One having intermittent employment as a flagman was injured when leaving an office in the railroad yards which were without a municipality. A small number of employees visited the office daily, but their numbers were not so great as to charge the company with knowledge of their presence. The court holds that such employee was at best a mere licensee in the technical sense of the term, and hence, as the company was under no duty to maintain a lookout for him, it was not liable.—*Illinois Central v. Pierce (Ky.)*, 194 S. W., 534. Decided May 8, 1917.

Invalids as Passengers

A regulation of a railroad company provided that sick or injured persons on cots or stretchers, accompanied by an attendant, might ride in the baggage car on orders from the superintendent. A paralytic, obliged to use an invalid's chair, bought a round trip ticket and rode in the baggage car in his chair to his destination without having obtained a permit from the superintendent. On his return he was not allowed to ride in the baggage car and sued for damages. He had made similar trips five or six times a year for ten years, but had obtained a permit only twice. The Court of Civil Appeals holds that the fact that he had been so allowed to ride was an accommodation merely which could be discontinued at any time, and to the continuation of which the plaintiff had no legal right.—*M. K. & T. v. Nelson (Tex.)*, 195 S. W., 1176. Decided June 15, 1917.

Carriage of Intoxicating Liquor

The Alabama Supreme Court holds that a carrier which has lawfully assumed the delivery of an interstate shipment of liquor, authorized by Ala. Act, January 27, 1915, may intervene in a seizure thereof under Act January 23, 1915, as a "person claiming any right, title or interest" therein. The provision of the former act, prohibiting possession at any one time of more than a certain quantity of liquor by any person or corporation, does not apply to an interstate carrier, the act permitting the importation of liquor in such quantity to every adult citizen. The latter act, declaring it unlawful to receive liquor for storage, distribution, or on consignment for another, or to maintain a warehouse therefor, does not apply to a carrier holding for delivery an interstate shipment of liquor authorized by the former act.—*State v. Pensacola, St. A. & Gulf S. S. Co. (Ala.)*, 75 So., 892. Decided May 31, 1917.

Passing Trains at Stations

A railroad had a rule reading: "Trains must use caution in passing a train receiving and discharging passengers at a station, and must not pass between it and the platform at which the passengers are being received or discharged." The Indiana Appellate Court holds, in an action for wrongful death of a person crossing tracks at a station, that the railroad's violation of the rule was not negligent *per se*, but proper as an item of evidence tending to show the degree of care recognized by the road as ordinary care under the conditions specified in the rule. It was held that the rule applied to a station having a station and platform on one side of double tracks and a cinder platform on the other with a walkway across the tracks. The tracks were curved to the east and west of the station, and passed through deep cuts, so that the view of approaching trains was obstructed. It was held to be the duty of the road's servants running a train to use reasonable care to ascertain if another train was at the station, discharging passengers, and if so, under the common law as well as the rule, to have used such reason-

able care as might be necessary for the protection of any person lawfully using the track at the station at the time. What constitutes reasonable care in such a case was held to depend on the circumstances, and may require constant lookout, after the place of possible danger is visible, the giving of warning signals, reduction of speed, or even stopping the train, in order to discharge the duty imposed.

The person killed was a farmer who had gone to the station to ship a case of eggs and remained to receive a milk can he was expecting. The train bringing the milk can was standing at the cinder platform side (on which the passengers alighted and crossed over around the end of the train). The deceased went on the other track, and was waiting for that train, which was about to pull out, to pass, when he was struck and killed. The trial court directed a verdict for the defendant; this was reversed on appeal. It was held that deceased was not a trespasser, though he was bound to exercise reasonable care for his own safety, commensurate with the dangers of which he had either actual or constructive notice, and that the question of his contributory negligence should have been submitted to the jury.—*Smith v. Cleveland, C. C. & St. L. (Ind.)*, 115 N. E., 603. Decided March 27, 1917.

Assumption of Risk by Passenger

A passenger is under no obligation to obey instructions of the railroad or its agents where obedience will subject passengers to great and obvious danger, and a passenger who obeys with knowledge of danger assumes the risk of injury. A passenger was seated in a safe place in a coach when a member of the train crew called out to the passengers to go into the car ahead. He picked up his traveling bag and some bundles, and went upon the platform. The train was then going so fast that, as he testified, he was afraid the car would jump the track or break its coupling. He was thrown from the platform as the train was rounding a curve. In an action for his injuries the New Jersey Supreme Court held he had assumed the risk of an obvious danger, and the railroad was not liable.—*McGrath v. D. L. & W. (N. J.)*, 100 Atl. 753.

"Intrastate Commerce"—Transportation of Circuses

The Arizona Supreme Court holds that, in a proceeding before the Arizona Corporation Commission to compel a railroad to transport the Campbell's United Shows from Tucson to Phoenix, the movement between these points was intrastate, subject to the jurisdiction of the commission, although the shows were engaged in a journey beginning in Texas and ending in California, the movement of the circus being a mere incident to the object of its existence.—*Cunningham, J.*, dissented, on the ground that, as it is the commencement and ending of the continuous journey in contemplation which fixes the character of interstate commerce upon the thing moved, the movement was interstate, and therefore the commission's order fixing a freight rate was void and incapable of placing a duty of transportation on the railroad company.—*Southern Pacific v. State (Ariz.)*, 165 Pac 303. Decided May 19, 1917.

Crossing Accident—Contributory Negligence

In an action for death of a motorcycle rider by being run over by a fast passenger train at a crossing, it appeared that the deceased approached the crossing without looking for trains, though an approaching train could have been seen had he looked. The Louisiana Supreme Court holds that the deceased's negligence continued to the moment of the accident so as to be a contemporaneous contributing cause, and the railroad was therefore not liable for the negligence of the engineer in failing to make an emergency stop upon seeing the deceased's danger. A man in full possession of his faculties, who goes upon a railroad track, must be held to know that he is upon such track, and that a train may be coming at any time, and must be held to the necessity of using his senses for his safety, and cannot absolve himself of negligence because of absent-mindedness.—*Barnett v. Louisiana Western (La.)*, 75 So., 649. Decided June 11, 1917.

Equipment and Supplies

LOCOMOTIVES

THE SOUTHERN PACIFIC is asking prices on 41 Santa Fe type and 10 six-wheel switching locomotives.

THE J. G. WHITE ENGINEERING COMPANY, New York, recently received a 300-hp. gasoline locomotive from the McKeen Motor Car Company, Omaha, Neb.

THE UNITED STATES GOVERNMENT has placed orders with the Baldwin Locomotive Works for 764 locomotives in addition to the 150 that company now has on order, and the 150 which will be built by the American Locomotive Company. The locomotives are for service with the forces in France, and will be given preference over all other work. The new order is as follows:

380	80 ton	Standard gage	Consolidation
195	.....	60 c m gage*	2-6-2
126	50 hp.	60 c m gage	Gasoline
63	30 hp.	60 c m gage	Gasoline

* 60 c m equals 1 ft. 11½ in.

The previous order for 300 locomotives, as was reported in the *Railway Age Gazette* of July 20, includes 150 80-ton standard gage Consolidation locomotives ordered from the Baldwin Locomotive Works, and 150 from the American Locomotive Company. The Baldwin Locomotive Works completed the first locomotive on its order last Saturday, and is building the remainder at the rate of four a day.

FREIGHT CARS

THE MARK MANUFACTURING COMPANY, Chicago, has ordered 18 70-ton capacity steel gondola cars of special construction from the American Car & Foundry Company.

THE ILLINOIS CENTRAL recently received from the McKeen Motor Car Company, Omaha, Neb., a 50-hp. distillate weed burner.

THE UNITED STATES GOVERNMENT has distributed orders among a number of car building companies for 6,000 30-ton standard gage and 2,997 narrow gage freight cars for service with the American forces in France. The standard gage cars will have two trucks, and are distributed as follows:

1200	Low side gondola.....	Pressed Steel Car
1000	Box	} Am. Car & Fdy.
300	Tank	
900	High side gondola.....	} Standard Steel Car
800	Box	
600	Flat	} Haskell & Barker
800	Refrigerator	
900	Box	Pullman

The narrow gage cars are of 600 mm. gage, the order being distributed as follows:

500	Flat	} Pressed Steel Car
100	Trucks	
166	Tank	} Am. Car & Fdy.
700	Low side gondola.....	
400	Low side gondola.....	Ralston Steel Car
400	Low side gondola.....	Magor Car
666	Box	Standard Steel Car
165	Gondola	Standard Steel Car

IRON AND STEEL

THE UNITED STATES GOVERNMENT has issued an inquiry for 20,000 tons of 25-lb. rail for use in France.

THE MISSOURI PACIFIC has ordered 180 tons of steel from the American Bridge Company for a riveted truss span at Sweet Springs, Mo.

MISCELLANEOUS

THE PITTSBURGH & LAKE ERIE has awarded a contract to the Roberts & Schaefer Company, Chicago, for a complete tandem four-pit cinder handling plant for installation at Haselton, Ohio.

Supply Trade News

P. M. Kling, consulting engineer of the Laconia Car Company, Leconia, N. H., has resigned. Mr. Kling retires, after having spent 34 years in the car industry.

The Hazard Manufacturing Company, Wilkesbarre, Pa., announces the appointment of George B. North as general sales manager, with headquarters at New York.

A. T. Stewart, general freight agent of the Missouri Pacific at Kansas City, Mo., has resigned, effective August 15, to become general traffic manager of the Sinclair Refining Company and the Sinclair-Gulf Corporation, with headquarters at Chicago.

McCord & Co. have purchased three and one-half acres of land at West Pullman, Ill., from the Illinois Central. This property has been occupied by the purchasers for the last two years under a lease from the Illinois Central, with the option of purchase. A part of the property is improved with a plant which has been used as a steel foundry for the manufacture of journal boxes.

James K. Howard has been appointed assistant to the president of the A. G. A. Railway Light & Signal Company, Elizabeth, N. J., with headquarters at Elizabeth. Mr. Howard was born on August 8, 1871, at Zanesville, Ohio. He entered railway service on the New Haven & Derby as a rodman, leaving that road in 1890 to enter Rutgers College. He left this institution in 1893 to enter the employ of the Peoria & Pekin Union, serving successively as assistant engineer and engineer until 1899. In July, 1900, he went with the Wabash as division engineer, holding this position until July, 1905, when he entered the service of the Chicago, Peoria & St. Louis as engineer of maintenance of way. After serving in this capacity until January, 1907, he left the C. P. & St. L. to become engineer in charge of railway surveys in eastern Ohio and western Pennsylvania. In July, 1910, he was appointed engineer of maintenance of way on the Ann Arbor, leaving in January, 1913, to become assistant chief engineer for the Lorain, Ashland & Southern. In October, 1916, he was appointed northwestern representative of the A. G. A. Railway Light & Signal Company, with headquarters at Chicago, which position he held until his recent appointment as assistant to the president.

Unfilled Steel Orders Decrease

United States Steel Corporation reports that unfilled orders on hand July 31 amounted to 10,844,164 tons, a decrease of 539,123 tons, as compared with 11,383,287 tons on hand June 30.

Unfilled tonnage on May 31 amounted to 11,886,591 tons; on April 30, 12,183,083 tons; on March 31, 11,711,644 tons, and on July 31, 1916, 9,593,592 tons.

TRADE PUBLICATIONS

LATHES.—An attractive eight-page booklet recently issued by the Gisholt Machine Company, Madison, Wis., gives a number of illustrations of Gisholt lathes and time studies of work of various kinds of work turned out on them. The booklet contains a striking cover bearing the inscription: "Old Glory and the Allies," and showing the flags of all the nations now waging war on Germany.

PNEUMATIC PAINTING EQUIPMENT.—The Spray Engineering Company, 93 Federal street, Boston, Mass., has recently issued a folder describing its equipment for applying all kinds of liquid coatings with the Spraco paint gun. Particular attention is called to an extension pole attachment made up of a jointed fiber rod, which is used for covering surfaces beyond the reach of the operator, thus eliminating the necessity for staging or ladders.

ELECTRIC HOISTS.—The Lidgerwood Manufacturing Company, 96 Liberty street, New York, has recently issued bulletin No. 20, on Lidgerwood electric hoists. The bulletin contains 31 pages, each of which is devoted to a separate type of hoist, which is illustrated with a photograph. The special work for

which the hoist is designed is then described, as are the special features of the hoist. Finally a table of sizes is given containing all the necessary detailed information.

TIN PLATE.—The American Steel Export Company has recently published a 16-page illustrated booklet thoroughly describing in a concise way the practice of American makers of tin plate. The chief object of the booklet is the elimination of the confusion existing in the export trade because of the difference in the methods employed in the various countries where this commodity is manufactured. It deals first with a brief history, then the process of manufacturing. Numerous pages are devoted to the proper placing of orders, the exact method of figuring prices, and the usual method of packing for export.

EDISON STORAGE BATTERIES FOR USE IN STORAGE BATTERY LOCOMOTIVES is the title of bulletin 608 of the Edison Storage Battery Company, Orange, N. J. This bulletin, which is just off the press, describes the use of Edison storage battery locomotives in coal mining, metal mining and in general industrial service. The bulletin is full of photographs of locomotives in actual service, and there are two pages which contain complete general data and trade dimensions of Edison Type A storage batteries for storage battery locomotives. The last page describes the Edison electric safety mine lamp, which is more fully described in bulletin No. 300.

HOISTING MACHINERY FOR INDUSTRIAL TRUCKS is the title of a 115-page bulletin, No. 2,000, recently issued by the Shepherd Electric Crane & Hoist Company, Montour Falls, N. Y. The bulletin is loose-leaf and pocket size and contains complete and detailed specifications for the various types of hoists manufactured by the company. The class or frame size, capacity in pounds, hoisting speed feet per minute, number and size of hoisting rope, maximum lift in feet, catalogue number, shipping weight of each type of hoist are given in tabulated form, while on the opposite page the same type of hoist is shown in a line drawing where the clearance dimensions are given.

STORAGE BATTERIES FOR INDUSTRIAL TRUCKS.—The Edison Storage Battery Company, Orange, N. J., in bulletin No. 600, deals with Edison storage batteries for industrial transportation. The bulletin, which contains 32 pages, fully covers the use of electric tractors and trucks for use around factories, shops, freight houses, docks, terminal stations, etc. A special feature of the bulletin is the large number of photographs which illustrate the great variety of transportation work which electric trucks and tractors can do. The last few pages in the bulletin contain a general description of the Edison storage battery, how it is made and what it is made of, its operation, maintenance, etc. The last page is devoted to a table giving general data and tray dimensions of Edison storage batteries for industrial trucks, practice storage batteries, locomotives, etc.

COAL REQUIREMENTS OF INDIAN RAILWAYS.—It is estimated that the railways of India will require about 8,000,000 tons of coal during 1918, which represents about 20,000 tons of coal per day.

SPAIN MOBILIZES RAILROAD MEN.—Press despatches state that the Spanish government has decided to mobilize all railroad employees. They will remain at work, but will wear army uniforms. The Northern of Spain has issued a statement declaring there will be no strike as long as the government guarantees freedom to work. Although the Catalan railwaymen have handed the government a declaration of a general strike, conditions are still normal.

EUROPEAN RAILWAYS AND THE COAL FAMINE.—The shortage of fuel and its excessive cost are making themselves more and more felt in almost every country. The revenue is suffering greatly, and the service generally is much impeded. Both in Sweden and Denmark a number of trains, more especially fast trains, have been discontinued; in the latter country, for instance, the number of daily passenger trains has been reduced to less than half the normal, and fast or through trains are almost a thing of the past. As a result the trains are often overcrowded and unable to keep time. In Sweden the Board of the State Railways has just decided to propose a rise of at least 40 per cent in the present freight tariff, and a rise of 20 per cent to 25 per cent in the passenger tariff, to offset the great increase in operating expenses.—*Engineering, London.*

Railway Construction

GALESEBURG, ROCKFORD & NORTHERN.—The Illinois Public Utilities Commission has granted a certificate of convenience and necessity to this company for the purchase of the Hoopole, Yorktown and Tampico, and the extension of this line from Hoopole to a point on the Chicago, Rock Island & Pacific at Geneseo, a distance of approximately 12 miles.

NEW YORK, NEW HAVEN & HARTFORD.—This company is building with company forces a new yard between New Haven, Conn., and North Haven. In addition to the track work five steel bridges varying in length from 25 ft. to 200 ft. will be built, also general yard buildings. The grading work will be heavy.

PENNSYLVANIA RAILROAD.—This company has given a contract to Arthur McMullen, New York, for building the entire bridge line from Camden, N. J., to Petty's Island. (April 6, p. 765.)

ST. LOUIS-SAN FRANCISCO.—This company has completed plans for a railroad station at Oklahoma City, Okla. The building will be two stories high, 139 ft. wide and 146 ft. long, and will cost approximately \$300,000. It will be of reinforced concrete construction with cut stone and brick exterior. Bids for the work will be opened on September 15. Inquiries should be addressed to Lebenbaum, Marx & Vigeant, architects, Chicago.

TEXAS ROADS (ELECTRIC).—H. M. Gray, Las Cruces, N. Mex., and associates are promoting the construction of an electric line between Las Cruces and El Paso, Tex., about 44 miles.

TOLEDO, ST. LOUIS & WESTERN.—This road has completed plans for the construction of a freight house at Frankfort, Ind., and also for an extension to its office building at the same point. The specifications for the freight house call for a frame building 26 by 140 ft., the east 40 ft. of which will be two stories high and the balance one story high. The work includes the construction of an island platform 8 ft. by 150 ft., a house platform, and an incline for automobiles. The extension to the office building will be of brick construction two stories high, 20 ft. wide and 32 ft. long. In addition the company is planning improvements at Charleston, Ill., including an engine house and machine shop, a freight house and a reservoir. The engine and machine shop will be of timber and brick construction. The engine house will contain six stalls 96 ft. long. The machine shop will be 40 by 75 ft. The freight house plans provide for a one-story brick building 25 by 100 ft., with platforms, inclines, etc. The reservoir will have a capacity of 500,000 gal., and will be lined with concrete.

A VULNERABLE RAILWAY CENTER IN GERMANY.—Cologne has lately come in for considerable mention among advocates of air reprisals. This city is of such enormous importance as a railway center that it may without exaggeration be described as the key to the Western front. In fact it is unlikely that any other railway center has been such an important factor in the German plans of campaign ever since the beginning of the war. Study of a good railway map will show that Cologne focusses the whole railway network of Germany, forming, as it does, a junction for all the principal main lines from north and south and east. In fact, it is in some respects an even more important junction than Berlin, with which it is linked up with numerous main lines, and it is in addition the chief point in the system which runs along both banks of the Rhine, all the way from Frankfort-on-Main. In normal times, Cologne is the gateway to France and Belgium, and since August, 1914, this aspect of its importance has been enormously enhanced. Indeed, it is not too much to say that but for the network lines radiating from the Cathedral city, the whirlwind invasion of Belgium and northern France—the principal feature of the whole German plan of campaign—would have been impossible. When it is borne in mind that the only outlet to the West of all the railways entering Cologne is over a single bridge across the Rhine, which is very wide in this neighborhood, it will be realized how vulnerable is this railway center to attack from the air.—*Railway Gazette, London.*

Railway Financial News

BALTIMORE & OHIO.—See comments on the annual report for the calendar year 1916 elsewhere in this issue.

CHICAGO & WESTERN INDIANA.—The \$1,000,000 issue of 5 per cent notes due September 1, 1917, has been extended to September 1, 1918, at 5 per cent per annum.

CHICAGO, BURLINGTON & QUINCY.—This company has declared an extra dividend of 10 per cent, and the regular quarterly dividend of 2 per cent, both payable on stock of record date September 25. Books close September 19 and reopen September 25. The Chicago, Burlington & Quincy is controlled by the Great Northern and Northern Pacific Railroads, through joint ownership of practically all the \$110,839,100 stock outstanding, which is deposited behind the collateral 4's of the two controlling roads. The regular dividend rate of the Chicago, Burlington & Quincy is 8 per cent. The 10 per cent distribution by the Burlington amounts to \$11,083,910, of which about half, or \$5,500,000, will accrue to the Northern Pacific, and the same amount to the Great Northern. The Northern Pacific has outstanding \$248,000,000 capital stock, and the Great Northern \$249,476,850 preferred stock (there is no common stock), so that the Burlington distribution is equivalent to 2.2 per cent on both Northern Pacific and Great Northern preferred.

See also editorial comments elsewhere in this issue.

CINCINNATI, HAMILTON & DAYTON.—After protracted negotiation a settlement has been reached between the Baltimore & Ohio and the minority owners of Cincinnati, Hamilton & Dayton general mortgage bonds of 1939, which will complete the reorganization begun when the Baltimore & Ohio took over the operation and control of the Cincinnati, Hamilton & Dayton in 1909. Negotiations were principally carried on through Iselin & Co., and it is reported the minority bondholders will be allowed either \$1,000 in B. & O. Toledo Division 4 per cent bonds, plus \$140 in cash, for each \$1,000 C. H. & D. bond, or \$800 in Toledo Division bonds, plus \$280 in cash, the Baltimore & Ohio reserving an option to purchase the bonds for \$840 apiece in cash. The minority interest involved represents somewhat less than \$2,000,000 in face value of the bonds, out of \$17,529,000 issued, the bulk having been purchased by the Baltimore & Ohio at 70 and interest. The minority owners held out for the original offer of 85 with interest, or an exchange bond guaranteed by the Baltimore & Ohio.

GREAT NORTHERN.—This company has sold \$20,000,000 three-year 5 per cent notes to the First National Bank of New York. The notes were offered at 98 and interest, to yield 5¼ per cent. They are dated September 1, 1917, and are secured by \$25,000,000 of the company's first and refunding mortgage 4¼ per cent bonds which are due in 1961. The notes are redeemable at any time before September 1, 1918, at 101 and interest, and at any time thereafter before maturity at 100½ and interest. The purpose of the issue is to provide the Great Northern with funds to pay for improvements and equipment already purchased. The last previous important financing by the Great Northern was in 1911, when \$20,000,000 first and refunding 4¼ per cent bonds due 1961 were sold to J. P. Morgan & Co., the First National Bank and the National City Bank, who offered them at 102.

See also Chicago, Burlington & Quincy.

MISSOURI PACIFIC.—The syndicate which underwrote the \$46,000,000 cash requirements of the reorganization plan has been closed with the mailing of checks to syndicate members by Kuhn, Loeb & Co. The profit was 3 per cent, representing a distribution of \$1,380,000 to the subscribers who have been for more than a year liable for the cash requirements of the plan. This finally cleans up practically all matters pertaining to the Missouri Pacific reorganization, except that further opportunity will be given to a few stockholders, mostly residing abroad, to come in under the terms of the plan when the war situation permits them to deposit their securities.

NORTHERN PACIFIC.—See Chicago, Burlington & Quincy.

ANNUAL REPORTS

ST. LOUIS SOUTHWESTERN RAILWAY CO.—TWENTY-SIXTH ANNUAL REPORT "COTTON BELT ROUTE."

CHAIRMAN OF THE BOARD AND PRESIDENT,
New York, April 16, 1917.

To the Stockholders of the

St. Louis Southwestern Railway Company:

The Twenty-sixth annual report of your company, for the calendar year ended December 31, 1916, is herewith presented.

The report of Mr. J. M. Herbert, First Vice-President in Charge, which follows, exhibits full and complete details of operating revenues, expenses and other operating results, as well as the financial and physical condition of the property.

The amount of expenditures made on account of, and charged to, "Road and Equipment—Road" during the six months ended December 31, 1916, was \$142,005.64, of which there was appropriated from Income, \$132,579.61, representing expenditures made by the Company, and from Surplus, \$9,426.03, on account of "Donations" made by Individuals and Companies—like amounts being credited to "Corporate Surplus—Additions to Property through Income and Surplus."

It will be observed that the better earnings of the last fiscal year, while not in the judgment of the directors justifying any distribution to stockholders, have enabled the Company to improve its financial position and to liquidate floating liabilities of \$785,000 accumulated as a result of former operations.

Special attention is invited to Exhibit "R" containing a summary of Property Investments and Advances Unfunded, Cash Loans to Controlled and Affiliated Lines, and Unpledged Securities (not necessary for control) held in the Treasury as of December 31, 1916.

CAPITAL STOCK.

No change has been made in the Capital Stock during the period covered by this report. Exhibit "M" on page 39 shows the par value authorized and the par value outstanding as of December 31, 1916.

FUNDED DEBT.

The amount of Funded Debt, outstanding in hands of the public, was increased during the period under review in the sum of \$285,000, explained as follows:

Equipment Trust Obligations Issued:

Series "F"—Guaranty Trust Co. of New York, Trustee:

For Equipment:

12 Consolidation Freight Locomotives \$420,000.00
8 Ten-wheel Passenger Locomotives }

Deduct:

Equipment Trust Obligations Matured and Paid:

Special Equipment Trust—The Philadelphia

Trust Safe Deposit and Insurance Co.—

Trustee \$33,000.00

Series "D"—U. S. Trust Co. of New York—

Trustee 17,000.00

Series "E"—Guaranty Trust Co. of New

York—Trustee 85,000.00

135,000.00

Net Increase \$285,000.00

The Public Service Commission of the State of Missouri, after a full hearing, duly approved the issuance of the Equipment Trust Obligations as shown in the foregoing statement.

Detailed exhibits of Funded Debt as of December 31, 1916, will be found on pages 40 and 41.

The faithful and efficient services of the officers and employees of the Company are acknowledged, with pleasure.

For the Directors,

EDWIN T. GOULD,
Chairman of the Board
and President.

St. Louis, Mo., April 2, 1917.

MR. EDWIN GOULD,

Chairman of the Board and President,
New York City, N. Y.

DEAR SIR:

Pursuant to the order of the Interstate Commerce Commission, dated November 24, 1916, establishing the calendar year as the fiscal year for common carriers by rail, and the subsequent action of the Board of Directors, changing the fiscal year of this company accordingly, I present herewith a report upon the business and operations of the Company for the calendar year ended December 31, 1916, and its financial and physical condition as of that date.

The last report to the Stockholders was for the fiscal year ended June 30, 1916, and the report now submitted continues the operations and financial transactions for the period, July 1 to December 31, 1916 (thus preserving the continuity of records and statistics without duplication), and also contains Income and Profit and Loss statements for the full calendar years 1916 and 1915, for comparative purposes.

The financial results from operation for the calendar years 1916 and 1915 and for the six months periods, July 1 to December 31, 1916, and 1915, will be found in the condensed statements immediately following:

FINANCIAL RESULTS FROM OPERATION SYSTEM.

INCOME STATEMENT FOR CALENDAR YEAR.

ITEM.	YEAR ENDED. Dec. 31, 1916.	Dec. 31, 1915.	+Increase. —Decrease.
AVERAGE MILES OPERATED.....	1,753.8	1,753.8	
OPERATING INCOME:			
Railway Operating Revenues.....	\$13,850,130.43	\$11,275,023.98	+\$2,575,106.45
Railway Operating Expenses.....	9,418,305.55	7,848,790.52	1,569,515.03
Net Revenue from Ry. Operations	\$4,431,824.88	\$3,426,233.46	+\$1,005,591.42
Railway Tax Accruals.....	\$651,813.76	\$598,792.84	+\$53,020.92
Uncollectible Railway Revenues.....	2,357.36	3,458.52	1,081.16
Total.....	\$608,194.12	\$602,251.36	+\$5,942.76
Railway Operating Income.....	\$4,919,633.76	\$3,823,982.10	+\$1,095,651.66
NONOPERATING INCOME.....	1,528,996.77	1,127,794.04	+\$401,202.73
GROSS INCOME.....	\$5,448,630.53	\$3,951,776.14	+\$1,496,854.39
DEDUCTIONS FROM GROSS INC.....	3,220,465.56	3,215,763.88	+\$4,701.68
NET INCOME.....	\$2,228,164.97	\$736,012.26	+\$1,492,152.71

DISPOSITION OF NET INCOME:

Income Appropriated for Invest. in Phys. Property.....	132,579.61	132,579.61
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INCOME BALANCE TRANSFERRED TO PROFIT AND LOSS.....	\$2,089,585.36	\$736,012.26	+\$1,353,573.10
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PROFIT AND LOSS STATEMENT.

ITEM.	YEAR ENDED. Dec. 31, 1916.	Dec. 31, 1915.	+Increase. —Decrease.
CREDITS:			
Credit Balance (at beginning of fiscal period).....	\$4,212,863.27	\$3,669,330.13	+\$543,533.14
Credit Balance Trans. from Income.....	2,089,585.36	736,012.26	1,353,573.10
Unfunded Overcharges.....	1,083.74	779.94	303.80
Donations.....	17,701.74	10,759.10	7,942.64
Miscellaneous Credits.....	60,482.08	21,426.94	39,055.14
Total.....	\$6,375,716.19	\$4,438,308.37	+\$1,937,407.82

DEBITS:

Surplus Appropriated for Investment in Physical Property.....	\$11,701.74	\$10,759.10	+\$942.64
Funded Debt Discount Extinguished through Surplus.....	16,178.62	795.20	15,383.42
Loss on Retired Road and Equipment—Road.....	28,656.12	18,203.12	10,453.00
Loss on Retired Road and Equipment—Equipment.....	195,328.17	44,646.18	150,681.99
Delayed Income Debits:			
Reparation Claims and Expenses—Ark. Rate Case.....	6,260.41	115,370.95	109,110.54
Tap Line Reparation Claims.....	3,752.44	25,435.85	19,683.41
Miscellaneous.....	16,677.76		16,677.76
Miscellaneous Debits.....	22,405.35	12,234.70	10,170.65
Balance Credit Carried to General Balance Sheet.....	6,074,555.58	4,212,863.27	1,861,692.31
Total.....	\$6,375,716.19	\$4,438,308.37	+\$1,937,407.82

FINANCIAL RESULTS FROM OPERATION—SYSTEM.

INCOME STATEMENT FOR SIX MONTHS.

ITEM.	SIX MONTHS ENDED. Dec. 31, 1916.	Dec. 31, 1915.	+Increase. —Decrease.
AVERAGE MILES OPERATED.....	1,753.8	1,753.8	
OPERATING INCOME:			
Railway Operating Revenues.....	\$7,906,459.74	\$6,280,778.60	+\$1,625,681.14
Railway Operating Expenses.....	4,884,093.94	3,972,574.06	891,519.88
Net Rev. from Ry. Operations.....	\$3,022,365.80	\$2,308,204.54	714,161.26
Railway Tax Accruals.....	\$306,615.10	\$289,876.86	16,738.24
Uncollectible Railway Revenues.....	1,323.08	2,280.10	956.98
Total.....	\$307,938.18	\$292,156.92	\$15,781.26
Railway Operating Income.....	\$2,714,427.62	\$2,016,947.62	\$697,480.00
NONOPERATING INCOME.....	747,591.00	498,227.42	249,363.58
GROSS INCOME.....	\$3,462,018.62	\$2,515,175.04	\$946,843.58
DEDUCTIONS FROM GROSS INC.....	1,616,758.85	1,623,725.63	6,966.78
NET INCOME.....	\$1,845,259.76	\$891,449.41	\$953,810.35

DISPOSITION OF NET INCOME:

Income Appropriated for Invest. in Phys. Property.....	132,579.61	132,579.61
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INCOME BALANCE TRANSFERRED TO PROFIT AND LOSS.....	\$1,712,680.15	\$890,544.96	+\$822,135.19
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PROFIT AND LOSS STATEMENT.

ITEM.	SIX MONTHS ENDED. Dec. 31, 1916.	Dec. 31, 1915.	+Increase. —Decrease.
CREDITS:			
Credit Balance (at beginning of fiscal period).....	\$4,594,829.45	\$3,408,524.03	\$1,186,305.42
Credit Balance Trans. from Income.....	1,712,680.15	890,544.96	822,135.19
Unfunded Overcharges.....	448.44		448.44
Donations.....	4,340.07	4,841.25	501.18
Miscellaneous Credits.....	1,714.37	2,268.87	554.50
Total.....	\$6,313,908.44	\$4,307,480.06	\$2,006,428.38

DEBITS:

Surplus Appropriated for Investment in Physical Property.....	426.00	\$107,701.10	\$1,333.67
Funded Debt Discount Extinguished through Surplus.....	15,078.62		15,078.62
Loss on Retired Road and Equipment—Road.....	3,286.98	10,712.48	6,948.50
Loss on Retired Road and Equipment—Equipment.....	1,893.58	35,300.33	33,406.75
Delayed Income Debits:			
Reparation Claims and Expenses—Ark. Rate Case.....	27.85	67,101.01	67,073.16
Tap Line Reparation Claims.....	16,677.76	25,435.85	8,758.09
Miscellaneous.....	891.41		891.41
Miscellaneous Debits.....	891.41	891.41	
Balance Credit Carried to General Balance Sheet.....	6,074,555.58	4,212,863.27	1,861,692.31
Total.....	\$6,228,844.44	\$4,717,400.06	\$1,511,444.38

Inasmuch as the business for the fiscal year ended June 30, 1916, has been fully presented in the preceding annual report, the following com-

ments and statements (excepting statements of Income and Profit and Loss) for the calendar years 1916 and 1915) are confined to the operations for the six months period, July 1 to December 31, 1916, compared with the same period of 1915, and to the changes in the assets and liabilities as reflected in the general balance sheet as of December 31, 1916, compared with that of June 30, 1916.

OPERATING REVENUES.

The total operating revenues for the six months period amounted to \$7,906,459.74, an increase of \$1,625,681.14, or 28.38% compared with the same period of preceding year. In Exhibit "A" on page 28, will be found a statement showing separately the increases and decreases in each of the several classes of revenues.

Comparative exhibits containing interesting data of a statistical nature as to the freight and passenger operations, will be found on pages 46 and 47.

OPERATING EXPENSES.

During the six months period, the total operating expenses were \$4,884,093.94, an increase of \$911,519.88, or 22.95%, compared with the same period of preceding year.

Attention is called to Exhibit "A" on pages 28 and 29, in which is shown the increases and decreases in the several general operating expense accounts, and the ratios of each to total operating revenues, also to Exhibit "B" on pages 30 and 31, showing operating expenses by primary as well as by general accounts.

It will be noted that an increase of \$1,625,681.14 (or 28.38%) in operating revenues was accomplished with an increase of only \$287,409.80 (or 15.81%) in Transportation Expenses, and that of the increase in operating revenues only 17.68% was used to take care of the increase in Transportation Expenses.

The ratio of Transportation Expenses to Total Operating Revenues for the six months period was 26.62% for the System. For the St. Louis Southwestern Railway Company, proper, it was 22.10%.

Notwithstanding increases of \$304,200.76, or 38.32%, in Maintenance of Equipment and \$277,005.49, or 36.07%, in Maintenance of Way and Structures, the relatively small increase in Transportation Expenses resulted in a reduction in the ratio of Total Operating Expenses to Total Operating Revenues from 63.55% for the period of preceding year to 61.77% for the period under review.

CAR AND TRAIN LOADING.

Following will be found tables showing the average load, in tons, per loaded freight car mile, and per freight train mile, for the past eight and one-half years:

Average number of tons (including company material) per loaded car mile:		St. L. S. W. Ry. Co.		St. L. S. W. Ry. Co.	System.
Year ended		June 30,		of Texas,	
1909	17.84		16.67	17.49	
1910	18.58		16.89	18.14	
1911	18.78		17.30	18.32	
1912	18.02		16.44	17.55	
1913	18.36		16.44	17.78	
1914	18.22		16.19	17.62	
1915	17.95		16.57	17.55	
1916	18.18		17.40	17.95	
Six Months ended					
Dec. 31, 1916	18.72		17.23	18.30	
Average number of tons (including company material) per train mile:		St. L. S. W. Ry. Co.		St. L. S. W. Ry. Co.	System.
Year ended		June 30,		of Texas,	
1909	394.23		190.34	301.61	
1910	434.16		196.27	326.11	
1911	423.70		200.04	320.16	
1912	411.11		211.14	340.58	
1913	461.11		214.50	349.49	
1914	455.14		199.32	337.65	
1915	457.53		208.21	345.21	
1916	489.88		252.71	386.40	
Six Months ended					
Dec. 31, 1916	497.85		251.93	394.12	

The handling of freight, to and from connecting lines, during the six months period ended December 31, 1916, was seriously interfered with on account of the unprecedented congestion of freight traffic throughout the country, especially in the East, which resulted in numerous embargoes being placed from time to time by Eastern carriers. In consequence of this congestion, the shipment of much of the 1916 crop of cotton was necessarily withheld until after December 31, 1916.

SHORTAGE OF FREIGHT CARS.

During the latter part of July, 1916, the shortage of freight cars was quite apparent, and by September 1st had become extremely acute. The demand for cars increased from week to week, causing the greatest car shortage in the history of the Company.

On account of being an originating carrier, the greater part of this Company's cars were sent beyond its rails, and in spite of repeated efforts to secure a corresponding return of equipment from connecting lines, very little was accomplished in that direction. This condition reduced the supply of cars on this Company's lines to approximately fifty per cent of its ownership, which condition had a material effect on the Company's revenues. Late in the Fall of 1916 the Interstate Commerce Commission initiated a hearing at Louisville, Kentucky, with the object of forcing cars home to owners; various orders were issued to accomplish this, but practically no benefit was derived therefrom.

RATE SITUATION.

The financial results from operation for the period of six months covered by this report were adversely affected, in no small degree, by increases in wages and in cost of materials and supplies.

Since the close of the period ended December 31, 1916, the constantly advancing prices of materials and supplies of all kinds, including fuel, growing out of the European conflict and various other causes, have acquired a momentum which has carried them to figures unheard of heretofore. Added to these almost prohibitive costs, the railroads have been required to shoulder numerous additional burdens, such as: higher wages for trainmen and engineers, under provisions of the Adamson Law, effective January 1, 1917; necessary increases in the wages of other employees of all classes, higher rates of taxes and additional forms of taxation as well as other onerous increased expenses which have to be met.

These conditions, coupled with a lack of adequate facilities and available credit, have brought the railroads and the public face to face with a most critical situation, in which the railroads may be placed in a position to efficiently handle existing traffic and be prepared to meet the

necessities of the international situation, it is absolutely essential that they be granted higher rates.

Realizing the emergency now confronting them the railroads have made application to the Interstate Commerce Commission for a general advance in interstate freight rates and to the various state rate-making bodies for similar general advances in State rates.

It is hoped that both the Federal and State rate-making bodies, recognizing the acute predicament in which the railroads now find themselves, as well as the justice of their claims, will speedily grant the necessary relief in the way of the prayed-for advances in rates.

AGRICULTURAL AND INDUSTRIAL.

Agriculture is one of the most important industries of the Southwest and a proper appreciation of the many opportunities for improvement in agricultural methods should result in a corresponding increase in agricultural resources. This can best be accomplished through education and demonstration of proven principles of farm management, through encouragement of the live stock industry and conservation of soil fertility. Much educational work has been conducted along these lines by the Company's Agricultural and Industrial Department.

The six months period covered by this report includes the harvest time for the cotton crops. During this period, the territory served by this Company's lines has enjoyed unusual prosperity due to good crops, high price of cotton, its by-products, and grains, and because of the fact that the farmers have practiced crop diversification and have produced the greater part of their foodstuffs during their former period of adversity. It is hoped that this company is taking an active interest, to grow more feed and foodstuffs will, no doubt, be productive of good results during the 1917 crop season.

The rice crop of Arkansas was the largest and best in the history of the industry and highly profitable to the growers. However, the shipment of a large part of this crop was delayed beyond the period of this report, on account of the car shortage and other conditions.

The demand for lumber and other forest products has been good, and the movement during the six months period under review has been as heavy as the car supply would permit. The extreme car shortage which prevailed during all of the latter part of 1916, made it impossible to supply all of the cars required for the lumber industry, and while the tonnage was greater than during the corresponding period of the previous year, this increase was largely due to the heavier loading per car. The present demand for lumber is unprecedented and with a better car supply should show a greater tonnage for 1917.

Throughout the territory traversed by this company's lines, there has been a most commendable continuation of industrial development. Cities, towns, and rural communities have undergone substantial improvements, especially as to more and improved types of schools, construction of good roads, drainage ditches, etc.

The enactment of the Federal Farm Loan Law will have a tendency to stabilize farm credits in the South and to make it possible for the farmers to borrow money from usual sources at a reasonable rate of interest and under conditions whereby they can make more permanent improvements. In order to place the advantage of the Federal Farm Loan Act clearly before the farmers, the Agricultural and Industrial Department of these lines has distributed a large number of the Federal Farm Loan "primers" and have also given instructions in meetings and otherwise as to the proper methods to pursue in the formation of local Federal Farm Loan Associations. In several localities, local associations have already been formed in anticipation of the establishment of the Federal Farm Loan Banks, which will put the law into practical operation.

FEDERAL VALUATION.

The work of valuation of these lines, begun by the Interstate Commerce Commission late in the year of 1914, was continued during the six months under review. The field forces of the Government have completed their work on the line, and the data obtained taken to the Chicago Office of the Division of Valuation for pricing and final valuation.

The preparation of Land and Equipment data, which is being compiled by the Company in response to orders of the Commission, is under way and will probably be ready for submission in the Summer of 1917. The completion of the Division of Valuation work on the Federal Farm Loan Act, which has been on the Company's books since February 8, 1915, are still engaged, and it is expected, will complete their work in the Company's general offices by the middle of the Year 1917. As nearly as can be determined at this time, the Commission's "Tentative Valuation" of these lines was made in the latter part of 1917 and under the Valuation Act the Company will have thirty days within which to file its protest.

The amounts expended by these lines on account of Federal Valuation work to date are as follows:

Year ended June 30, 1915	\$14,812.81
Year ended June 30, 1916	30,639.66
Six months ended December 31, 1916	10,478.17
Total	\$55,930.64

During the latter part of 1916, the Commission served "Tentative Valuations" on four carriers, consisting of the Atlantic & Pacific Railroad Company, The Texas Midland Railroad Company, New Orleans, Texas & Mexico Railroad Company and The Kansas City Southern Railway Company. Each of these carriers filed vigorous protests against the methods employed and results obtained by the Commission and several hearings have since been held on the subject of these protests. These hearings have been attended by representatives of the Company.

INVESTMENT IN ROAD AND EQUIPMENT.

In Exhibit "H" on page 35, under heading "Investment in Road and Equipment" will be found a statement of expenditures made for additions and betterments during the six months period ended December 31, 1916.

EQUIPMENT.

On page 61 will be found a list of equipment owned as of December 31, 1916, compared with June 30, 1916, showing changes made during the six months period.

Eight ten-wheel passenger locomotives and twelve consolidation freight locomotives, acquired under the terms of an Agreement of Conditional Sale, and referred to in the preceding annual report, have been received and placed in operation since the close of the period ended December 31, 1916.

A program is now in effect which provides for the rehabilitation of freight equipment, extending over a period of three years. This program involves the dismantling and rebuilding of 4,650 box cars at the rate of 1,550 per annum, heavy maintenance repairs to 829 freight cars of various classes, the retirement (by scrapping or sale) and "writing out" of Road and Equipment—Equipment account, of 537 light capacity (40,000 pound) freight cars of various classes, which are no longer fit for service on account of light capacity, old age and decay, and the equipping of freight train cars owned with safety appliances. United States standard, all of which work is now being carried on at the Company's shops. At close of

the period ended December 31, 1916, 616 box cars have been dismantled and rebuilt, and heavy repairs have been made to 343 cars of various classes, and 71 of the obsolete light capacity cars, have been scrapped or sold and their original cost "written out" of the Equipment account. The program for equipping cars with safety appliances, United States standard, is well under way and it is now anticipated that all freight cars will meet the requirements of the Interstate Commerce Commission not later than March 1, 1918, the final date set by the Commission for compliance with the Safety Appliance Act.

Since the period covered by this report, contract has been let for the building of 125 steel underframe, 80,000 pound capacity, box cars to fill the vacancies caused by destruction of a similar number of 60,000 pound capacity wooden box cars, covered by Equipment Trust Agreements, and arrangements have been made to fill such vacancies in future by building the cars at Company shops.

VALLEY TERMINAL RAILWAY.

The Valley Terminal Railway has been organized for the purpose of constructing a complete freight terminal at Valley Junction, in St. Clair County, Illinois, adjoining East St. Louis. The capital stock of the Valley Terminal Railway is owned by this company. Property (consisting of about 126 acres of land) has been acquired, plans for the track layout, engine house, machine and car repair shops, and various other buildings have been made, and at the date of this report, work has been commenced, and if weather conditions permit, it is hoped the work may be completed during September or October of the present year.

This Terminal will connect with the Missouri Pacific—St. Louis Southwestern Joint Illinois main line, and The Terminal Railroad Association of St. Louis (through its subsidiary, the Illinois Transfer Railroad), at Valley Junction, Illinois, and with both the Alton & Southern and Illinois Central Railroads at the East end. At present it is the intention to lay out fourteen miles of track.

EXHIBIT R.

SUMMARY OF PROPERTY INVESTMENTS AND ADVANCES UNFUNDED, CASH LOANS TO CONTROLLED AND AFFILIATED LINES, AND UNPLEDGED SECURITIES (NOT NECESSARY FOR CONTROL) HELD BY COMPANY'S TREASURY, AS OF DECEMBER 31, 1916—SYSTEM.

ACCOUNTS.	DETAILED AMOUNT.	TOTAL AMOUNT.
St. L. S-W. Ry. Co. of Texas, expenditures.		
INVESTMENT IN ROAD AND EQUIPMENT—ROAD, UNFUNDED—		
St. L. S-W. Ry. Co., expenditures, January 1 to June 30, 1916.	\$34,856.08	

St. L. S-W. Ry. Co. of Texas, expenditures, January 1 to June 30, 1916.	482,643.42	\$517,499.51
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INVESTMENTS IN AFFILIATED COMPANIES—

BONDS—UNPLEDGED—

Paragould S.E. Ry. Co., First and Ref. Mtg. Bonds—Par Value.	\$511,000.00	
Southern Ill. & Mo. Bridge Co., First Mtg. Bonds—Par Value.	600,000.00	\$1,111,000.00

ADVANCES—OPEN ACCOUNTS—

So. Ill. & Mo. Bridge Co.—Cons. Adv.	\$40,009.29	
Gray's Point Term. Ry. Co.—Cons. Adv.	25,456.88	
Paragould S.E. Ry. Co. Cons. Adv.	3,454.02	
The Pine Bluff Ark. Riv. Ry.—Cons. Adv.	30,427.83	
Memphis R. R. Term. Co.—Cons. Adv.	110,297.10	
Dal. Term. Ry. & U. D. Co.—Cons. Adv.	3,726.68	
Stephenville N. & S. Texas Ry. Co.—Construction Advances	54,521.18	268,927.98

LOANS—COV. BY BILLS RECEIVABLE—

Valley Terminal Railway.	\$260,870.80	260,870.80
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UNADJUSTED DEBITS—

PROPERTY ADVANCES—IN SUSPENSE—

Illmo. Mo. Term. Realty Adv. in Sus.	\$25,555.37	
Additional Freight Term. Ft. Worth, Tex.		
Total expenditures	\$734,911.16	
Deduct amount funded.	250,000.00	484,911.16
		\$10,466.53

SECURITIES ISSUED OR ASSUMED, UNPLEDGED—

St. L. S-W. Ry. Co., Com. Stock—Par Val.	\$143,900.00	
St. L. S-W. Ry. Co., Pref. Stock—Par Val.	106,350.00	
St. L. S-W. Ry. Co., First Term. & U. Mtg. Bonds—Par Value.	4,114,000.00	4,364,250.00
Total		\$7,032,114.82

BROOKLYN RAPID TRANSIT CO.—REPORT OF THE BOARD OF DIRECTORS TO THE STOCKHOLDERS

FOR THE YEAR ENDING JUNE 30, 1917.

85 Clinton Street,
Brooklyn, N. Y., July 23, 1917.

The operations of the system for the year ending June 30, 1917, with comparison for the preceding fiscal year, are shown generally in the following table:

COMPARATIVE STATEMENT OF THE RESULTS OF THE OPERATIONS OF THE BROOKLYN RAPID TRANSIT SYSTEM FOR YEARS ENDED JUNE 30, 1917 AND 1916.

	1917	1916	Increase—Decrease—
Gross Earnings from Operation.	\$29,504,018.96	\$27,948,771.81	+\$1,555,247.15
Operating Expenses	16,741,417.19	15,693,907.81	+ 1,047,509.38
Net Earnings from Operation	12,762,601.77	12,254,864.00	+ 507,737.77
Income from Other Sources	427,814.75	438,705.88	- 10,891.13
Total Income	13,190,416.52	12,693,569.88	+ 496,846.64
Less Taxes and Fixed Charges	7,995,178.23	7,081,737.70	+ 913,440.53
Net Income	5,195,238.29	5,611,832.18	- 416,593.89
Surplus at Beginning of Year.	11,562,654.04	10,621,966.45	+ 940,687.59
Total	16,757,892.33	16,233,798.63	+ 524,093.70
Other Credits to Surplus during year	22,603.07	29,958.05	- 47,354.98
Total	16,780,495.40	16,303,756.68	+ 476,738.72
Of this amount there has been appropriated:			
Accounts written off.	5,515.97	6,330.75	- 814.78
Adjustment of Expenses prior year*	1,088.36	8,621.97	- 9,710.33
Supersession and Depreciation	289,022.50	66,247.94	+ 222,774.56
Loss from operation of Employees' Restaurant	5,631.86	2,338.35	+ 3,293.51
Adjustment of Special Franchise and Real Estate Taxes	135.37	183,970.44	- 183,835.07
Expenses in connection with Thompson Legislation Investigation of Public Service Commission		4,850.00	- 4,850.00
Allowance to Employees in Military Service	17,345.81	1,425.19	+ 15,920.62
Christmas Gratuities to Employees	29,341.29		+ 29,341.29
Dividend on B. R. T. Co.'s Stock outstanding	4,467,318.00	4,467,318.00	
Total Appropriations	4,813,222.44	4,741,102.64	+ 72,119.80
Balance Sheet Surplus	\$11,967,272.96	\$11,562,654.04	+ \$404,618.92

*Credit.

The year's surplus applicable for dividends was \$5,195,238.29—equivalent to 6.97 per cent on Brooklyn Rapid Transit Company's stock outstanding.

The gross revenue from operation was \$29,504,018.96, a gratifying increase of \$1,555,247.15, or 5.56 per cent.

The operating expenses were increased by the same influences which have prevailed generally throughout the country in cumulative force since

the breaking out of the European war, namely, the rising prices of labor and materials. These expenses aggregated \$16,741,417.19, an increase of \$1,047,509.38, or 6.67 per cent—most of which increase was represented by higher wages. The percentage of operating expense to transportation revenue was 56.74, as compared with 56.15 for the preceding year. The charges to maintenance of way and structure and equipment aggregated \$5,001,637.33, a slight increase over the charges for the preceding year. The amount expended, however, was less than the amount charged by \$120,376.02, which balance was carried to the credit or reserves. The large increase in the cost of power was due primarily to two factors, namely, the higher cost of coal, and the necessity for purchasing outside power because of delay on the part of the Public Service Commission in approving arrangements for the supply of power for rapid transit lines.

The burden of taxation continues to increase, the amount charged for the year being \$2,331,104.16, which is 27.94 per cent more than for the preceding year.

Deductions from operating income were swelled by the addition of \$442,863 to interest, on account of new rapid transit properties placed in operation. Other interest and rental deductions were somewhat less than for the preceding year, making the net deductions \$400,018.89 greater. The remaining surplus is \$416,593.89 less than for the preceding year. In other words, the addition of \$1,555,247.15 in gross operating revenue, while \$507,237.77 was saved in net revenue, the net operating revenue and interest absorbed all of this saving and considerably more. Nevertheless the company was able to maintain its dividend rate of 6 per cent, and add a substantial amount to the system's surplus.

It is gratifying to note that the operations of the company's rapid transit lines in conjunction with those provided by the city under the provisions of the contracts of March 19, 1913, resulted for the year ending June 30, 1917, in earnings not only the first preferential of \$3,500,000 (which accrues under the contracts to the operator and is applied to interest on obligations outstanding prior to the date of the contracts, and to dividends), but within \$250,371.77 of interest at the rate of 6 per cent on the cost of the properties placed in operation since March 19, 1913. This deficit is cumulative and becomes a charge against the earnings before the company receives interest on its investment. The total deficiency from the beginning of temporary operation on August 4, 1913, to June 30, 1917, is \$1,037,276.78. In other words, notwithstanding that it is subsequently to be made good, has been absorbed as it accrued in the respective annual statements of the system. These results have been attained before the completion of the combined system and without the addition of any new lines which contribute materially to net earnings. The showing is indicative of the possibilities of the completed system and justifies the previously expressed confidence that it will only be a short time after complete operation when all of the operator's preferentials will have been earned and the city will begin to get interest on its investment. The Broadway subway, which is expected to contribute largely to this result, will be partially opened for operation during the next few months, but unfortunately the completion of the entire line with its resulting benefits will be still longer deferred.

SPECIAL BURDENS ON SURFACE LINES.

The street surface railroad companies of the system have applied to the Public Service Commission for a modification of its order of March 17, 1914, establishing certain rules and regulations regarding the issuance of transfers.

This order was accepted under protest and without waiving any legal rights, and upon the understanding that in case the effects should be adverse the companies would apply to the Commission for relief. The Commission's order required the establishment of over three hundred additional transfer points, and became effective June 1, 1914. Under the new regulations the passenger receipts of these companies have remained practically stationary, while during the three years preceding the order the average increase in passenger revenue had been over \$600,000 per year. The number of transfer passengers carried, however, has increased from 146,000 in 1913, to nearly 173,000,000 in 1917, and the average fare per passenger has consequently decreased from 3.41 cents in 1913 to 3.26

EMPLOYEES' SUBSCRIPTIONS TO LIBERTY BONDS.

The participation of employees of the system in the Government Liberty Loan was particularly gratifying. The number of employees making subscriptions was 7,744, and the total number of bonds subscribed for was \$578,850. Of these bonds 10,775 were in \$50 denomination. Subscriptions came from every department, and were encouraged by the partial payment plan offered by the company, whereby to those who chose to avail themselves of this plan installments on account of subscriptions are deducted weekly or monthly from the pay rolls—the period of payment extending over one year or the term of certain employees over two years, in the case of other employees. By this method not only was the volume of subscriptions made large, but employees were encouraged to set aside a portion of their earnings in a thrift fund. In order to finance the transaction the company borrowed the amount necessary to pay for the bonds originally, with the privilege of reducing its loan from week to week as installments on the purchase price are received from subscribers.

EMPLOYEES' WELFARE WORK.

For various activities in the interest of the health, social entertainments, life insurance and welfare of its employees, the companies of the system expended during the year \$132,803.78, including the application to these items of \$13,487.36 received from the collection of fidelity bond premiums. Of this amount \$32,653.68 was for pensions, and \$35,559.50 was for life insurance.

On June 30, 1917, 6,245 employees were members of the Group Insurance Plan—a net increase of 497. During the fiscal year the beneficiaries of deceased employees were paid the sum of \$61,000 under the terms of the policies.

RELATIONS BETWEEN COMPANY AND EMPLOYEES.

Throughout the labor disturbances in the summer and autumn of 1916, which temporarily interfered with the operations of most of the transportation lines of the city, our employees gave renewed evidence of their loyalty and co-operation. They repelled the efforts of outside agitators to stir up discord and to paralyze service. The sympathetic relations which had prevailed for years between men and management remained unbroken. In order that it might be strengthened, a better opportunity given for mutual consultation, the functions of the Employees' Benefit Association (comprising practically all employees) were enlarged by provision for the election by secret ballot of trustees representing the various departments of the system, who will be the spokesmen of their fellow employees, respectively, in working out in conjunction with heads of departments the improvement of working conditions. These departmental trustees meet periodically and have already accomplished much towards the purposes for which they were elected.

FIRE INSURANCE.

The Insurance Reserve Fund was increased during the year by \$59,836.84, and amounted on June 30th last to \$898,934.02. The average amount of reinsurance in effect during the year was \$25,046,494.38, upon which the fire losses made during the year total of 23.8%. On account of certain adjustments this rate was somewhat sub-normal.

The fire losses during the year aggregated \$1,959.47, of which \$399.73 was paid out of the reserve fund, and the remainder through reinsurance. The protection for prevention of fire has been rigid and systematic, and this accounts for the very small percentage of loss.

FREIGHT OPERATION.

The South Brooklyn Railway Company has continued to conduct the freight operations of the system. These have been interfered with considerably during the past year by reconstruction work on lines and terminals, and by the competition of automobile trucks in the carriage of beer, ice and asphalt. The freight revenues were \$205,556.09, an increase of 12,386.04, and the operating expense was \$304,666.22.

Several new sidings at manufacturing plants have been installed, and this seems to be the tendency on the part of Brooklyn manufacturers to take further advantage of the facilities which are offered. This is particularly true in outlying territories where freight operation can be conducted without interference with the regular passenger business of the system.

MISCELLANEOUS IMPROVEMENTS, RENEWALS AND REPAIRS.

Additions, renewal and even ordinary maintenance work have been retarded and prevented by the prevailing conditions affecting the supply of labor and materials. Not only has the work been more expensively, but on account of the impossibility or delay of getting material, much desirable work has had to be postponed. This is particularly true in renewals of tracks, where only a part of the reconstruction program has been carried out because of the failure to get rail. This condition seems likely to continue for at least another year.

Among the various expenditures for maintenance and construction during the fiscal year (other than construction and equipment expenditures on rapid transit lines referred to in a preceding part of this report) are the following:

The 30,000 K.W. Turbo Unit and Condenser Outfit, contracted for in January, 1916, for the Williamsburg Power Station, which was to have been received in August, 1916, was not delivered until recently. The condenser has been installed and the turbo unit is being erected and is expected to be ready for service about the first of October.

Repairs have been made for a further increase in power facilities by a reconstruction of the East River Power Station. The 25,000 K.W. Turbo Units for this station have been contracted for, to be delivered during May and November of 1919.

During the year 18 Taylor stokers were installed in the Williamsburg Power Station, making 24 in all. In addition, 8 blower engines have been installed, 4 of which are now in service. Orders have been placed for 36 additional stokers and 4 blower equipments, making a total of 72 stokers for the station. In the same station the rebuilding of coal downtakes for 18 boilers, and the provision of ash downtakes for 11 boilers have been completed; the main steam header was rebuilt; the work of rebuilding the auxiliary steam piping in the boiler room on account of increase in the working steam pressure is about one-half completed; 42 feed water regulators have been ordered, and a boiler was installed to provide automatic regulation of the feed water, which will result in more efficient operation of the boilers and auxiliaries.

At the Central Power Station two coal bridges have been constructed, with a capacity of 125 tons of coal per hour, and two of these bridges is in operation and the second is under way. The slip on the north side of the station was rededicated to provide for the entrance of barges in connection with the proposed storage of coal on the north side of the slip.

At Richmond Hill, the new substation was completed. The 3,000 K.W., Essex Street Substation from 3,000 K.W. to 5,000 K.W.; the Parkville Substation from 4,000 K.W. to 6,000 K.W.; part of these increases in capacity being provided by the transfer of power from other stations.

Additional switchboard panels have been installed in the Tompkins and Myrtle Substations, and additional switchboard equipment has been ordered for the Coney Island Substation.

During the year the overhead lines removed from the system 49.71 miles of overhead direct current feeders, of which 11.02 miles were reinstalled in other parts of the system; 25.09 miles of underground feeders were removed, and 14.69 miles reinstalled in other parts of the system.

There were renewed 97.40 miles of trolley wire, and 1,309 feet of conduit line were constructed on Avenue H from the Brighton Beach line to Ocean Avenue.

There were 862 trolley poles installed during the year; 419 removed; 181 reset; 375 reinforced, and 2,450 repainted.

On May 4, 1917, the surface railroad operating headquarters at Ridge-wood were transferred to the new terminal at Fresh Pond Road, and the former property was put up for sale.

Various improvements and repairs were made in buildings and other structures.

Approximately 11½ miles of surface track were reconstructed, involving the entire removal of the old track structure and foundation, and its replacement with new 7-inch standard grooved girder rail, on wood ties, with cast welded joints and tie rods, and the installation of new pavement on concrete foundation.

The surface track overhauled and repaved amounted to 12,652 lineal feet of single track.

The new lines of surface track constructed during the year aggregated 56,465 feet measured as single track. This construction was at the following places:

Palmetto St., St. Nicholas Ave. to Myrtle Ave.	944 ft.
Flatbush Ave., Ave. N. to Ave. U	8,673 "
Eighth Ave., 39th St. to Jay Ridge Ave.	15,432 "
Fresh Pond Rd., Luthern Line to Metropolitan Ave.	3,652 "
Metropolitan Ave., Dry Harbor Rd. to Jamaica Ave.	18,041 "
Surf Ave., West 8th St. to West 5th St.	591 "
New 110th St., Brighton Beach	4,932 "
Line on Ralph, Fulton and Kemble Aves. to Atlantic Gulf and Pacific Co.'s plant.	4,200 "

With the exception of the new street at Brighton Beach and the line leading to the Atlantic Gulf and Pacific Company at Mill Island, the above construction was 7-inch grooved girder rail with sheet asphalt pavement on concrete foundation. Granite curb pavement with sand foundation on Flatbush Avenue, and standard 5-inch granite on concrete foundation on the remainder of the lines.

We reconverted car tracks to the extent of 122,111 square yards of pavement, divided as follows:

New granite on concrete	74,758 square yards
New granite on sand	4,903 "
Recut granite on concrete	12,589 "
Recut granite on sand	11,234 "
Wood block	11,234 "
Sheet asphalt	14,720 "
	122,111 "

Twenty-one pieces of surface track special work were installed; 75 renewed, and 33 repaired. Twelve electric switches were installed.

The single track on Adams Street, north of Front Street, comprising 230 lineal feet, was again improved by the laying of a single track from property conveyed to the Brighton-by-the-Sea at Brighton Beach.

A dump track for disposal of snow was installed at the dock at the foot of Fulton Street.

Surface storage tracks were removed from the storage yard at Ocean Avenue and Avenue Z, upon expiration of the lease of that property.

The new drawbridge over Coney Island Creek at Stillwell Avenue and the connecting tracks were placed in operation.

Of the 1,652 lineal feet of structure were repaired; 21,998 ties were renewed, besides 106,832 lineal feet of guard rail, and 58,170 lineal feet of footwalk.

The rail and special work renewals on the elevated lines consisted of renewing 41,426 feet of 80-rb running rail; 4,988 feet of 100-lb. running rail; 702 feet of guard rail, besides various frogs and switches.

The equipment of all surface passenger cars with air brakes required by order of the Public Service Commission was completed with the installation of 128 sets of air brakes on 116 cars. The equipment of all elevated passenger cars; there were also installed 24 geared hand brakes, completing this installation.

Whiting electrically driven cranes were installed on three cars, displacing derricks and pillar cranes.

Considerable work was done in the repainting, repainting and overhauling of equipment, the number of surface cars passing through the shops for this purpose, or for damage in operation, being 3,280, and number of elevated cars 1,184.

For experiments' purpose four sets of passenger cars were equipped with enclosed platforms, the doors of which are interlocked with the power control of the car.

Various machines were added to the shop equipment.

Three hundred pairs of Brill maximum traction trucks were equipped with inside hinge brake riggings, and 87 pairs of the same class of trucks on cars of the Coney Island & Brooklyn Railroad Company were equipped with fixed wheel guards.

INCREASE IN NUMBER OF STOCKHOLDERS.

The number of stockholders at the date of closing the books for dividends in June, 1917, was 9,187, an increase of 149 as compared with the similar date of 1916.

RESERVE ACCOUNTS.

Reserves have been added to during the year as follows:	
Insurance	\$59,836.84
Amortization of Capital, etc.	\$73,229.61
Employer's Liability	\$0,451.23

Total.....\$33,517.68

As against these additions, however, payments have been made on account of Employer's Liability amounting to \$20,522.55, and charges to amortization of Capital, etc., on account of property retired, aggregate \$474,802.12, thereby reducing the accumulated reserves, as shown in the balance sheet by \$171,811.99. The adjustments for property retired which are reflected both in this statement, in the direct charges to profit and loss, and in the capital accounts) are somewhat abnormal, being increased considerably by the discard of obsolete passenger house equipment, no longer required transmission lines and by the removal of car tenders.

CONSTRUCTION EXPENDITURES.

On account of the construction and equipment of rapid transit lines under contract with the City, the New York Municipal Railway Corporation has expended during the year an additional amount of \$9,146,736.03, making the total expended from June 1, 1917, to June 30, 1917, \$11,149,308.40.

On account of contribution to City-owned lines	\$11,149,308.40
On account of equipment of City-owned lines	8,371,379.79
On account of additions, extensions and improvements of existing railroads	30,458,760.53

Total.....\$49,981,311.32

Other economies of the system have expended during the year for track and roadway (including extensions), \$1,249,326.83, and for \$256,318.12 for power plant, \$174,657.27 for cars and electrical equipment, \$22,589.00 for buildings and fixtures, \$48,608.43 for real estate, and the remainder for other purposes. Against these charges, however, credits have been made for properties displaced aggregating in value

\$957,200.82, leaving a net addition to the property accounts of other companies \$292,125.71.

BROOKLYN RAPID TRANSIT REFUNDING MORTGAGE FOUR PER CENT. BONDS.

Authenticated to July 1, 1916..... \$55,705,000.00
Authenticated during year..... 223,000.00

Converted into stock..... \$55,928,000.00
29,619,000.00

Net Authenticated and Outstanding..... \$26,309,000.00

In hands of the Public..... \$3,459,000.00
In possession of the B. R. T. System..... \$22,850,000.00

As follows:
Collateral to \$60,000,000.00 6 yr. 5 per cent. Notes..... \$10,000,000.00
Collateral to Bills Payable..... 6,690,000.00
In Treasury B. R. T. R..... 4,583,000.00
In Treasury N. E. R. R..... 587,000.00

Deposited with City of New York by The N. E. R. R. Co..... 15,000.00
Deposited with Trustee of The Nassau Electric Railroad Consolidated Mortgage..... 725,000.00
Guaranty Fund Brooklyn City Railroad Lease..... 250,000.00
\$22,850,000.00

* \$2,265,000 par value of these notes have been converted into New York Municipal Railway Corporation's five per cent. first mortgage bonds, as permitted, prior to January 1, 1916, by the terms of the trust agreement.

Detailed statements of operation, various statistics and consolidated balance sheet are appended hereto.

The Board of Directors desires to express its appreciation of the loyalty and efficiency of its employees during the past year, particularly in view of the trying conditions of the times through which we are passing.

In order of the Board,
T. S. WILLIAMS,
President.

CHICAGO, BURLINGTON & QUINCY RAILROAD COMPANY—SIXTY-THIRD ANNUAL REPORT

Chicago, January 1, 1917.

To the Stockholders of the Chicago, Burlington & Quincy Railroad Company:

As of July 1, 1916, there was issued the Sixty-Second Annual Report of your Company, covering the year ended June 30, 1916. Since then the Interstate Commerce Commission has changed its fiscal year for which carriers are required to make reports, to end December 31 instead of June 30 as heretofore. A similar change in the fiscal year has been made by most of the railroads of the country and your directors took similar action at meeting held January 24, 1917.

It has seemed best, for purpose of future comparisons, to make this report cover the fiscal year ended December 31, 1916, and the figures are so presented herein. There are included, however, for the six months period ended December 31, 1916, an Income Account Statement, and tables showing Changes in Equipment, Revenue Freight Carried and Investment in Road and Equipment.

COMPARATIVE INCOME STATEMENT, YEARS ENDED DECEMBER 31.

Per Cent.	1916	OPERATING REVENUES.	1915	Per Cent.
70.80	\$ 77,310,516.00	Freight	\$ 64,211,845.33	68.61
20.00	21,833,534.25	Passenger	20,438,621.92	21.84
2.47	2,691,304.66	Mail	2,593,884.14	2.77
2.61	2,854,713.02	Express	2,436,064.43	2.60
2.06	2,250,015.47	Miscellaneous	1,983,640.41	2.12
1.97	2,149,529.24	Incidental	1,847,724.06	1.98
.09	101,591.85	Joint facility	77,924.14	.08
100.00	\$109,191,204.49	Total operating revenue	\$ 93,589,722.43	100.00
OPERATING EXPENSES.				
11.17	\$ 12,203,996.81	Maintenance of way and structures	\$ 12,025,216.06	12.85
15.62	17,053,851.51	Maintenance of equipment	14,833,787.07	15.85
1.52	1,662,805.07	Traffic	1,577,138.03	1.69
29.32	32,014,940.04	Transportation	28,810,984.20	30.79
.93	1,013,164.78	Miscellaneous operations	846,608.48	.90
2.02	2,203,307.74	General Transportation for investment—Cr.	2,033,345.36	2.17
Cr. 84	Cr. 916,376.29	Investment—Cr.		
59.74	\$ 65,235,704.66	Total operating expenses	\$ 60,127,079.20	64.25
40.26	\$ 43,955,499.83	Net operating revenue	\$ 33,462,643.23	
	\$ 4,820,197.37	Railway tax accruals	\$ 4,262,551.56	
	36,314.88	Uncollectible railway revenues	24,157.35	
	\$ 4,856,512.25		\$ 4,286,708.91	
	\$ 39,098,987.58	Operating income	\$ 29,175,934.32	

NONOPERATING INCOME.				
	\$ 1,578,114.13	Rents	\$ 925,698.49	
	1,413,202.63	Miscellaneous interest	379,168.88	
	\$ 2,991,316.76	Total nonoperating income	\$ 1,304,867.37	
	\$ 42,090,304.34	Gross income	\$ 30,480,801.69	

DEDUCTIONS FROM GROSS INCOME.				
	\$ 2,065,577.91	Rents	\$ 1,629,870.64	
	6,960,493.46	Interest on funded debt	7,077,551.97	
	752.94	Interest on unfunded debt	6,072.27	
	55,163.52	Amortization of discount on funded debt	82,592.32	
	13,590.86	Miscellaneous income charges	12,822.16	
	\$ 9,095,578.69	Total deductions	\$ 8,808,909.36	
	\$ 32,994,725.65	Net income	\$ 21,671,892.33	

DISPOSITION OF NET INCOME.				
Appropriations for:				
	\$ 1,864,286.81	Sinking funds	\$ 1,783,800.38	
	8,867,128.00	Dividends	8,867,128.00	
	8,864,595.48	Additions and betterments	3,340,669.28	
	2,400,000.00	Fund for accrued taxes not yet due		
	6,000,000.00	Miscellaneous appropriations		
	\$ 27,996,010.29	Total income	\$ 13,991,597.66	
	\$ 4,998,715.36	Income balance	\$ 7,680,294.67	

CAPITALIZATION.

CAPITAL STOCK.

Number of Shares.	Total Par Value Authorized and Outstanding.	Dividends Declared During the Year.	
		Rate.	Amount.
1,108,391	\$110,839,100.00	8%	\$8,867,128.00

The capital stock outstanding remained without change during the year.

FUNDED DEBT.

Nominally Issued.	Actually Issued.				Interest Accrued During Year on Bonds "Actually Outstanding."
	Reacquired			Actually Outstanding.	
In Treasury.	In Treasury.	Pledged.	In Sinking Funds.		
\$9,873,000	\$3,885,400	\$31,000	\$23,466,700	\$176,487,900	\$6,960,493.46
The funded debt outstanding was reduced \$4,838,000. This					reduction was

The funded debt outstanding was reduced \$4,838,000. This reduction was in bonds purchased and held in the treasury.

held by Trustees of sinking funds..... 1,319,500
canceled and retired..... 566,000

\$4,838,000

MILEAGE.

MILEAGE OF ROAD OPERATED ON DECEMBER 31, 1916.

STATE	Line Owned		Operated Under Lease or Contract.		Total Mileage Operated.
	Main Line.	Branches and Spurs.	Total.		
Colorado	214.11	180.25	394.36	34.97	429.33
Illinois	891.48	783.53	1,675.01	114.06	1,789.07
Iowa	371.68	993.44	1,365.12	73.44	1,438.56
Kansas	12.71	246.61	259.32	.82	260.14
Minnesota	23.61		23.61	14.84	38.45
Missouri	593.62	528.68	1,122.30	13.15	1,135.45
Montana	134.38		134.38	49.54	183.92
Nebraska	1,364.76	1,485.58	2,850.34	22.37	2,872.71
South Dakota	48.88	231.07	279.95		279.95
Wisconsin	222.33		222.33	.53	222.86
Wyoming	571.54	120.91	692.45	30.76	723.21
Total	4,442.10	4,570.07	9,019.17	354.48	9,373.65

LINE OWNED.

STATE.	Miles of Road.		Second Track.		Third Track.		Yard Track and Sidings.		Total.
	First Track.								
Colorado	394.36								394.36
Illinois	1,675.01	412.94	42.40						2,130.35
Iowa	1,365.12	243.55							1,608.67
Kansas	259.32								259.32
Minnesota	23.61		2.25						25.86
Missouri	1,122.30	112.12							1,234.42
Montana	134.38								134.38
Nebraska	2,850.34	17.96							2,868.30
South Dakota	279.95								279.95
Wisconsin	222.33	136.65							358.98
Wyoming	692.45								692.45
Total	9,019.17	925.47	42.40						9,987.04

The increases during the year were:
in road owned..... 3.45 miles
in line operated..... 40 miles

TAXES.

	1916.	1915.	Increase or Decrease
Colorado	\$ 299,308.12	\$ 260,248.06	Inc. \$ 39,060.06
Illinois	1,007,460.77	996,333.36	Inc. 11,127.41
Iowa	550,365.16	534,041.13	Dec. 3,675.97
Kansas	80,230.64	67,211.30	Inc. 13,009.34
Minnesota	32,604.31	32,528.25	Inc. 76.06
Missouri	296,094.75	403,578.10	Dec. 107,483.35
Montana	58,124.72	72,670.50	Dec. 14,545.78
Nebraska	1,074,782.38	1,079,838.13	Dec. 5,055.75
South Dakota	156,068.03	108,277.83	Dec. 57,790.20
Wisconsin	235,473.54	265,206.08	Dec. 9,732.54
Wyoming	309,444.33	206,803.24	Inc. 102,641.09
Other States	199.51	280.55	Dec. 81.04
Total States	\$4,130,146.26	\$4,047,016.53	Inc. \$83,129.73
United States Government	\$690,051.11	\$215,535.03	Inc. \$474,516.08

Grand Total \$4,820,197.37
The large increase in the United States government tax was due principally to the change of rate from one per cent to two per cent of the net income.

STATISTICS OF OPERATIONS.

The large increase in Operating Revenues, and the increased efficiency of operation, resulted in reducing the operating ratio from 64.25 in 1915 to 60.58 in 1916. This operating ratio of 1916 was further reduced to 59.74 by the deduction from Operating Expenses of the credit for "Trans-

portation for Investment" as a recent requirement by the Interstate Commerce Commission.)

Increased efficiency of operation is shown by an increase of 22.7% in ton miles of revenue freight being carried with increases of only 11.7% in freight train miles and of 10.8% in freight train car miles.

STATISTICS OF OPERATIONS.

ITEM.	1916.	1915.	Increase or Decrease.
Average mileage of road operated (miles).....	9,370.39	9,368.00	Inc. 2.39
TRAIN-MILES.			
Freight—ordinary.....	18,185,157	16,282,873	Inc. 1,902,284
—light.....	124,133	111,143	Inc. 13,010
—total.....	18,309,310	16,394,016	Inc. 1,915,294
Passenger.....	17,965,959*	17,714,045	Inc. 251,914
Mixed.....	697,909	745,955	Dec. 48,046
Special.....	23,665	35,199	Dec. 12,134
Total transportation service.....	36,996,243	34,889,215	Inc. 2,107,028
Work service.....	864,423	876,051	Dec. 11,628
LOCOMOTIVE-MILES.			
Freight—principal.....	18,331,202	16,411,285	Inc. 1,919,917
—helper.....	834,914	675,270	Inc. 149,644
—light.....	876,031	767,720	Inc. 108,311
—total.....	20,032,147	17,854,275	Inc. 2,177,872
Passenger—principal.....	17,901,359	17,649,101	Inc. 252,258
—helper.....	133,119	201,075	Dec. 67,956
—light.....	336,888	354,349	Dec. 17,491
—total.....	18,371,336	18,204,525	Inc. 166,811
Mixed train—principal.....	698,060	746,059	Dec. 47,999
—helper.....	1,265	3,236	Dec. 1,971
—light.....	5,819	5,994	Dec. 175
—total.....	705,144	755,289	Dec. 50,145
Special—principal.....	23,070	35,199	Dec. 12,129
—helper.....	1,820	5,363	Dec. 3,543
—light.....	793	2,996	Dec. 2,203
—total.....	25,683	43,558	Dec. 17,875
*Includes 64,600 motor train miles.			
Train switching.....	1,098,367	1,016,172	Inc. 82,195
Yard switching—freight.....	9,458,900	8,049,747	Inc. 1,409,167
—passenger.....	668,073	656,343	Inc. 11,730
—total.....	10,126,982	8,706,085	Inc. 1,420,897
Total transportation service.....	50,359,659	46,579,904	Inc. 3,779,755
Work service.....	1,592,852	1,628,187	Dec. 35,335
LOCOMOTIVE TON-MILES.			
Freight train service.....	3,041,175,374	.....	.....
Mixed train service.....	34,266,388	.....	.....
Passenger train service.....	1,687,271,789	.....	.....
Special train service.....	2,513,066	.....	.....
Total transportation service.....	4,765,226,567	.....	.....
CAR-MILES.			
Freight train—loaded.....	529,041,014	454,886,356	Inc. 74,154,658
—empty.....	213,131,161	215,377,659	Dec. 2,246,558
Sum of loaded and empty.....	741,173,115	670,264,015	Inc. 71,909,100
Freight train—caboose.....	18,548,211	16,604,846	Inc. 1,943,375
—total.....	760,721,336	686,868,861	Inc. 73,852,475
Passenger train—passenger.....	45,919,278†	44,958,989	Inc. 960,289
—sleeping, parlor and observation.....	28,220,580	28,005,419	Inc. 215,161
—dining.....	4,958,673	4,987,581	Dec. 29,908
—other.....	38,203,438	36,199,700	Inc. 2,003,739
—total.....	117,301,319†	115,951,698	Inc. 1,349,621
Mixed train—freight, loaded.....	3,135,961	3,042,826	Inc. 93,135
—freight, empty.....	1,637,206	1,158,933	Dec. 478,273
—caboose.....	24,819	36,724	Dec. 11,905
—passenger.....	1,184,995	1,332,510	Dec. 147,515
—sleeping, parlor and observation.....	73,042	2,580	Dec. 70,462
—dining.....	296,594	106	Dec. 296,488
—other passenger—train.....	296,594	356,891	Dec. 60,297
—total.....	5,757,617	5,824,570	Dec. 66,953
†Includes 64,600 motor car miles.			
Special train—freight—loaded.....	284,393	297,077	Dec. 12,684
—freight—empty.....	46,868	15,306	Inc. 31,562
—caboose.....	1,688	30,351	Dec. 28,663
—passenger.....	99,264	103,742	Dec. 4,478
—sleeping, parlor and observation.....	152	13,919	Dec. 13,767
—dining.....	50	2,639	Dec. 2,589
—other passenger—train.....	1,117	8,131	Dec. 7,014
—total.....	453,541	471,065	Dec. 17,524
Total transportation service.....	884,233,813	809,116,194	Inc. 75,117,619
Work service.....	3,568,785	4,018,593	Dec. 449,808
FREIGHT SERVICE.			
Tons—revenue freight.....	39,278,135	32,996,554	Inc. 6,281,581
—non-revenue freight.....	9,052,606	8,996,409	Inc. 56,197
—total.....	48,330,741	41,992,963	Inc. 6,337,778

STATISTICS OF OPERATIONS (Continued)

	1916	1915.	Increase or Decrease.
Ton miles—revenue freight	10,223,326,440	8,899,951,311	Inc. 2,023,375,128
" miles—non-revenue freight	1,914,590,652	1,675,195,298	Inc. 139,395,354
" miles—total	12,737,917,092	10,575,146,610	Inc. 2,162,770,482

PASSENGER SERVICE.

Passengers carried—revenue	22,879,435	22,728,128	Inc. 151,307
Passenger miles—revenue	1,097,092,168	1,111,848,183	Dec. 14,756,015

REVENUES AND EXPENSES.

Freight revenue	\$77,310,516.00	\$64,211,845.33	Inc. \$13,098,670.67
Passenger revenue	21,833,534.25	20,438,621.92	Inc. 1,394,912.33
Passenger service train revenue	28,133,297.61	26,130,477.74	Inc. 2,003,319.87
Operating revenues	\$109,191,203.49	\$91,589,722.43	Inc. \$15,601,481.06
" expenses	65,235,704.66	60,127,079.20	Inc. 5,108,625.46
Net operating revenues	\$43,955,498.83	\$33,462,643.23	Inc. \$10,492,856.60

AVERAGES PER MILE OF ROAD.

Freight-train miles	1,954	1,750	Inc.	204
Passenger-train miles	1,917	1,891	Inc.	26
Mixed-train miles	74	80	Dec.	6
Special-train miles	2	3	Dec.	1
Transportation service (train-miles)	3,947	3,724	Inc.	223
Work-train miles	92	94	Dec.	2
Locomotive-miles—transportation	5,374	4,973	Inc.	402
Freight service car-miles	81,670	73,809	Inc.	402
Passenger service car-miles	12,695	12,561	Inc.	134
Freight revenue	\$ 8,250.51	\$ 6,854.38	Inc.	\$1,396.13
Passenger service train revenue	3,002.41	2,789.33	Inc.	213.08
Operating revenues	11,652.77	9,990.36	Inc.	1,662.43
" expenses	6,961.90	6,418.35	Inc.	543.55
Net operating revenues	4,690.89	3,572.01	Inc.	1,118.88
Ton-miles—revenue freight	1,165,728	950,038	Inc.	215,690
" —all freight	1,359,380	1,128,859	Inc.	230,521
Passenger miles—revenue	117,081	118,686	Dec.	1,605

AVERAGES PER TRAIN-MILE.

Loaded freight car-miles—freight trains	28.89	27.75	Inc.	1.14
Loaded freight car-miles—mixed trains	4.49	4.08	Inc.	.41
Empty freight car-miles—freight trains	11.64	13.14	Dec.	1.50
Empty freight car-miles—mixed trains	1.48	1.55	Dec.	.07
Ton-miles—revenue freight	574.69	519.25	Inc.	55.44
" —all freight	670.16	616.99	Inc.	53.17
Passenger train car-miles—passenger trains	6.53	6.55	Dec.	.02
Passenger train car-miles—mixed trains	2.23	2.13	Inc.	.10
Revenue passenger-miles	\$8.78	\$6.23	Dec.	\$1.45
Freight revenue	1.51	1.42	Inc.	\$.09
Operating revenues	2.95	2.68	Inc.	.27
" expenses	1.76	1.72	Inc.	.04
Net operating revenues	1.19	.96	Inc.	.23

AVERAGES PER LOCOMOTIVE-MILE.

ITEM.	1916.	1915.	Increase or Decrease.
Train-miles—freight trains	.91	.92	Dec. .01
Car-miles—freight trains	37.98	38.47	Dec. .01
Train-miles—passenger trains	.98	.97	Inc. .01
Car-miles—passenger trains	6.39	6.35	Inc. .04
Train-miles—mixed trains	.99	.99	.....
Car-miles—mixed trains	8.17	7.71	Inc. .46
Train-miles—special trains	.90	.81	Inc. .09
Car-miles—special trains	17.66	10.81	Inc. 6.85

AVERAGES PER LOADED FREIGHT CAR-MILE.

Ton-miles—revenue freight	20.53	19.44	Inc.	1.09
" —all freight	23.94	23.09	Inc.	.85
Freight revenue	\$.14527	\$.14023	Inc.	\$.00505

AVERAGES PER CAR-MILE—PASSENGER.

Passenger miles—revenue	14.55	14.63	Dec.	.08
Passenger revenue	\$.28958	\$.26972	Inc.	\$.01986

MISCELLANEOUS AVERAGES.

Miles hauled—revenue freight	278.10	269.72	Inc.	8.38
" —non-revenue freight	200.45	186.21	Inc.	14.24
" —all freight	263.55	251.83	Inc.	11.72
Miles carried—revenue passengers	47.93	48.92	Dec.	.97
Revenue per ton of freight	\$1.96828	\$1.90021	Inc.	\$.02236
" —all freight	.00708	.00721	Dec.	.00013
" —passenger	.95429	.89927	Inc.	.05502
" —passenger-mile	.01990	.01838	Inc.	.00152
Operating ratio	% 59.74	% 64.25	Dec.	% 4.51

EQUIPMENT.

CLASS OF EQUIPMENT.	Number on Dec. 31, 1915.	Number Added During Year.	Number Retired During Year.	Number on Dec. 31, 1916.	Average Tractive Power All Locomotives and Average Capacity All Freight Cars.
Steam locomotives	1,767	1	22	1,746	31,515 lbs.
Freight-train cars:					
Box cars	30,429	1,359	1,334	30,454	
Flat cars	1,549		13	1,536	
Stock cars	7,669	245	453	7,461	

Coal cars	22,971	78	22,893	
Tank cars	213			
Refrigerator cars	2,943	32	2,911	
Caboose cars	693	1	679	
Other freight-train cars	80	1	79	
All classes of freight-train cars	66,547	1,605	1,926	66,226
Passenger-train cars:				
Couches	659	28	14	673
Combination passenger cars	146	1	6	154
Other combination cars	107	2	1	108
Dining cars	41			41
Parlor cars	14			14
Gazette and express cars	213	7	1	221
Postal cars	48	5	5	48
Other passenger-train cars	39			39
All classes of passenger-train cars	1,269	56	27	1,298
Company service cars:				
Officers' and pay cars	31	16		47
Ballast cars	2,493	101	291	2,303
Derrick cars	23	2	2	23
Steam shovels	19			19
Wrecking cars	17			17
Other company service cars	2,577	426	215	2,788
All classes of company service cars	5,161	543	508	5,196
All classes of cars in service	72,977	2,204	2,461	72,720
Floating equipment:				
Steamboats and tugboats	3	1		4
Barges, car floats and canal boats	58	2	2	58
Other floating equipment	11			11
Total floating equipment	72	3	2	73

REVENUE FREIGHT CARRIED DURING THE YEAR.

COMMODITIES.	Number of Tons Originating on this Road.	Number of Tons Received Connecting Carriers.	Total Number of Tons.	Per cent of Whole.
Products of Agriculture—				
Grain	4,361,415	883,414	5,444,829	13.9
Flour	470,116	216,171	686,286	1.7
Other mill products	221,235	49,921	271,156	0.7
Hay	243,558	59,687	303,245	.8
Tobacco	2,954	3,966	6,920	.01
Cotton	8,001	56,733	64,734	.1
Fruits and vegetables	721,207	1,372,025	2,093,232	5.3
Other products	144,891	117,368	262,259	.7
Total	6,299,988	2,108,406	8,408,394	21.4
Products of Animals—				
Live stock	1,786,534	306,117	2,092,651	5.3
Dressed meats	226,030	9,207	235,237	.6
Other packinghouse products	117,204	10,513	127,717	.3
Poultry, game and fish	74,048	58,133	132,181	.3
Wool	7,921	9,642	17,563	.1
Hides and leather	23,492	5,817	29,309	.1
Other products	83,097	37,887	120,984	.3
Total	3,318,326	437,316	3,755,642	9.0
Products of Mines—				
Anthracite coal	13,829	109,265	123,094	.3
Bituminous coal	9,643,139	2,086,771	11,730,910	29.8
Coke	48,417	31,562	79,979	.2
Ores	126,725	547,098	673,823	1.7
Stone, sand, etc.	1,993,376	351,346	2,344,722	6.0
Other products	135,518	362,337	497,855	1.3
Total	11,961,004	3,670,419	15,631,423	39.8
Products of Forests—				
Lumber	283,474	1,682,629	1,966,103	5.0
Other products	121,066	107,397	228,463	.6
Total	404,540	1,790,026	2,194,566	5.6

Manufactures—

Petroleum and other oils.....	706,301	433,379	1,139,680	2.9
Sugar.....	198,747	150,136	354,883	.9
Naval stores.....	11,901	6,217	18,118	.....
Iron, pig and bloom.....	25,990	188,745	214,735	.6
Iron and steel rails.....	17,852	147,295	165,147	.4
Other castings and machinery.....	178,809	286,190	464,999	1.2
Bar and sheet metal.....	80,588	326,609	407,197	1.0
Cement, brick and lime.....	1,401,654	522,789	1,924,443	4.9
Agricultural implements.....	181,032	66,902	247,934	.6
Tools, cranes, tools, etc.....	38,362	124,837	163,199	.7
Wines, liquors and beers.....	152,279	48,779	201,058	.5
Household goods etc.....	61,716	47,216	108,932	.3
Other manufactures.....	565,222	701,699	1,266,921	3.2
Total.....	3,640,353	3,056,843	6,697,196	17.0
Miscellaneous.....	800,574	283,331	1,083,905	2.8
Less Car Load.....	1,733,346	773,663	2,507,009	6.4
Grand Total, All Commodities.....	27,158,131	12,110,004	39,278,135	100.0

There was an increase of 6,281,581 tons, 19.04%, in revenue freight carried of which 4,687,982 tons, an increase of 20.86%, was in freight originating on this road, and 1,593,599 tons, an increase of 15.14%, in freight received from connecting carriers.

The principal increases were in grain, live stock, bituminous coal and in petroleum and other oils. The increase in grain was 1,309,370 tons, 31.66%, of which 1,102,112 tons, an increase of 31.86%, originated on this road. The increase in live stock was 205,463 tons, 10.89%, of which 166,124 tons, an increase of 10.75%, originated on this road. The increase in bituminous coal was 1,935,469 tons, 20.30%, of which 1,854,056 tons, an increase of 23.80% originated on this road. The increase in petroleum and other oils was 386,011 tons, 51.22%, of which 340,166 tons, increase 92.91%, originated on this road.

The increase in bituminous coal was due to some extent to our reaching new mines, but principally to the fact that last year eastern coal found its market in the east to a much greater extent than in former years, due to increased demand from industries for coal; also increased export and transshipment movement. The car situation and serious congestion in the east also militated against free movement to western territory, resulting in greatly increased demands for western and Illinois coal.

The increase in petroleum and its products was due principally to increased oil demand in the Wyoming fields served by this Company. This tonnage has developed satisfactorily.

INVESTMENT IN ROAD AND EQUIPMENT DURING THE YEAR.

ACCOUNT.	New Lines and Extensions.	Additions and Betterments charged to Road and Equipment.		Total.
		Appropriated from Income.	Total.	
Engineering.....	\$1,027.39	\$143,054.91	\$154,082.21	
Land for transportation purposes.....	Cr. 5,668.12	\$282,962.58	277,294.46	
Grading.....	107,880.53	927,500.17	1,035,380.70	
Tunnels and subways.....	26,715.40	.....	26,715.40	
Bridges, trestles and culverts.....	225,800.01	838,013.04	1,063,813.05	
Ties.....	20,661.96	268,362.56	289,024.52	
Rails.....	33,106.44	563,043.64	596,150.08	
Other track material.....	18,610.61	466,828.28	485,438.89	
Pallast.....	13,497.45	209,143.21	222,640.66	
Track laying and surfacing.....	44,204.19	331,992.16	376,286.35	
Signal and fence.....	6,468.11	36,831.18	43,299.29	
Snow sheds and sand fences and snow sheds.....	886.63	2,993.95	3,880.58	
Crossings and signs.....	7,156.11	157,439.39	164,595.50	
Station and office buildings.....	25,090.55	236,704.08	261,802.63	
Roadway buildings.....	637.30	3,014.36	3,651.66	
Water stations.....	3,172.58	114,751.20	117,923.78	
Fuel stations.....	Cr. 42,292	44,615.91	44,192.99	
Shops and engine-houses.....	Cr. 20,553.13	933,401.78	912,848.65	
Storage warehouses.....	.....	518.87	518.87	
Wharves and docks.....	.....	10,967.13	10,967.13	
Telephone and telegraph lines.....	2,327.36	25,856.69	28,184.05	
Signs and land interlockers.....	338.34	332,967.77	333,306.11	
Power plant buildings.....	.....	71,619.96	71,619.96	
Miscellaneous structures.....	17.58	93,635.10	93,652.68	
Paving.....	.....	7,009.35	7,009.35	
Roadway machines.....	.....	9,645.21	9,645.21	
Roadway small tools.....	.....	467.18	467.18	
Assessments for public improvements.....	.....	136,604.59	136,604.59	

Other expenditures.....	.....	.....	.....	.....
Road.....	16.41	.....	58.10	58.44
Shop machinery.....	.....	.....	77,350.24	77,350.24
Power plant machinery.....	.....	.....	104,264.44	104,264.44
Unexpended construction material and supplies.....	.....	.....	.....	.....
Total expenditures for road.....	161,600	1,013,962.58	\$6,716,640.44	\$7,605,661.64
Steam locomotives.....	.....	.....	126,799.96	Cr. 126,799.96
Electric locomotives.....	.....	.....	417,488.63	417,488.63
Passenger-train cars.....	.....	.....	445,921.27	445,921.27
Floating equipment.....	.....	.....	.....	.....
Work equipment.....	.....	.....	162,077.16	162,077.16
Miscellaneous equipment.....	.....	.....	895.60	895.60
Total expenditures for equipment.....	.....	.....	884,341.11	884,341.26
Law.....	100.00	.....	.....	100.00
Interest during construction.....	6,353.57	.....	137,147.77	173,501.34
Other charges.....	.....	.....	.....	.....
General.....	2,756.00	.....	.....	2,756.00
Total general expenditures.....	3,213.57	.....	137,147.77	176,351.34
Grand Total.....	\$655,497.70	\$8,819,662.58	\$7,677,578.87	\$8,616,034.14

* Of this amount \$1,175,999.32 was charged to previously appropriated surplus. The total of appropriations made as of June 30, 1916, and December 31, 1916, was (vide pages 5 and 23) \$8,864,395.48, which covered Additions and Betterments for 6 months to December 31, 1915, \$2,363,515.92, for 12 months to December 31, 1916, \$6,501,579.56.

During the year there was a further expenditure of \$94,680 for land for Chicago Terminals, making the total expended \$51,120,634.

For the reconstruction of the Missouri River bridge at Kansas City, there was expended during the year, \$711,179, of which \$694,338 was charged to Operating Expenses and the balance to Additions and Betterments. This makes the total expended to date \$1,012,768. It is estimated that the charges subsequent to Jan. 14, 1917, will amount to \$402,000, making the total cost for the bridge \$1,414,768.

There has been expended during the year for track elevation at Aurora, Ill., \$222,993, most of which was chargeable to Additions and Betterments, the total charged to date being \$1,003,584. The estimated further cost is \$2,061,592, making the estimate for complete work \$3,065,176.

The building of the new Chicago Union Passenger Station requires a rebuilding of your Company's freight terminals at Chicago, and during the year there was expended on a temporary freight terminal \$161,860, and on the permanent work \$20,089.

During the year the work on new shops and additional tracks at West Burlington has been carried along at an expenditure of \$911,468, most of which was charged to Additions and Betterments. The estimated further cost is \$544,301, making the total estimated cost at completion, \$1,455,769.

Second track has been constructed during the year:

Steward Jet. to Flag Center, Ill.....	\$164,628
On Beardstown Division.....	525,740
On La Crosse Division.....	372,454
Forbes to Curzon.....	88,726

Making a total of..... \$1,351,548

and the estimated cost of completing these pieces of double track will bring the total to \$2,921,165.

Work has been continued on the Chalco-Yutan Cut-Off at an expenditure during the year of \$438,440, making the total expended to date \$638,216 and leaving an estimated further expenditure of \$130,000 to complete the work.

On New Line and necessary side tracks between Glenview and Thornspool, there has been expended \$335,874, making the total amount expended \$558,757, leaving an estimated expenditure of \$20,000 to complete the work.

As indicated, the operations reflected in the accompanying statements and report are those for the year ended December 31st, 1916, during part of which numerous items of expense have been affected by increased cost of materials and labor. These increases will affect the Operating Expenses throughout the whole of the year 1917; and there will be the large additional expenses now accruing through the increase in wages resulting from the "sacred" law. Effective Jan. 1st, 1917, and through increases in other wages which have been granted or are in process of negotiation. The 1917 figures will also reflect the more recent increases in cost of locomotive fuel and material and supplies, accruing on account of economic and other conditions affecting the country as a result of the European War and conditions relating thereto. Pending revenue measures likewise indicate a substantial increase in taxes payable during the coming year.

Following is the report of the General Auditor with statements prepared by him:

By Order of the Board of Directors, HALE HOF DEN,
President.

FUNDED DEBT OF THE CHICAGO, BURLINGTON & QUINCY RAIL ROAD COMPANY.

Designation of Bond or Obligation.	Term.		Total Par Value Authorized.	Total Nominally or Actually Outstanding.	Nominally Outstanding, Half of or Less Company.			Interest.		
	Date of Issue.	Date of Maturity.			In Treasury.	Pledged as Collateral.	In Sinking Funds.	Actually Outstanding in Hands of Public.	Rate.	When Payable.	Accrued During Year Ending Feb. 15, 1915.
MORTGAGE BONDS.										
C. B. & Q. R. R.:										
General mortgage	Mar. 2, 1908	Mar. 1, 1958	\$ 75,130,000	\$ 75,120,000	\$ 9,873,000	.....	\$65,247,000	4	M. & N.	\$ 1,000,000.00
Illinois Division.....	July 1, 1899	July 1, 1949	50,835,000	50,835,000	384,000	.....	50,451,000	3	M. & N.	1,765,785.00
Illinois Division.....	July 1, 1899	July 1, 1949	34,165,000	34,165,000	189,000	.....	33,976,000	4	M. & N.	1,330,145.00
Iowa Div. mtge. sinking fund bonds.....	Oct. 1, 1879	Oct. 1, 1919	3,000,000	1,944,000	70,000	.....	1,865,000	5	A. & O.	\$ 8,400.56
Iowa Div. mtge. sinking fund bonds.....	Oct. 1, 1879	Oct. 1, 1919	12,502,000	4,816,000	241,000	.....	4,575,000	4	A. & O.	1,094,458.98
Nebraska, ext. mtge. sinking fund bonds.....	May 2, 1877	May 1, 1927	29,441,000	21,341,000	2,779,000	\$31,000	18,531,000	4	M. & N.	\$16,333.44

FUNDED DEBT OF THE CHICAGO, BURLINGTON & QUINCY RAILROAD COMPANY—CONTINUED.

FUNDED DEBT OF THE CHICAGO, BURLINGTON & QUINCY RAILROAD COMPANY—CONTINUED.										Interest	
Designation of Bond or Obligation.	Term.		Total Par Value Authorized.	Total Nominally or Actually Outstanding.	Nominally Outstanding, Held by or for Company.			Actually Outstanding in Hands of Public.	Interest		
	Date of Issue.	Date of Maturity.			In Treasury.	Pledged as Collateral.	In Sinking Funds.		Rate.	When Payable.	Accrued During Year on Bonds Actually Outstanding.
MORTGAGE BONDS.											
B. & M. R. R. R. in Nebraska:											
Consol. mtge. sinking fund bonds	July 1, 1878	July 1, 1918	\$13,751,000	\$13,613,000	\$7,000	.....	\$12,782,400	\$823,000	6	J. & J.	\$60,503.96
Republican Valley R. R.:											
Mort. sinking fund bonds	July 1, 1879	July 1, 1919	1,078,000	932,800	2,200	.....	917,800	12,800	6	J. & J.	3,636.41
*Tarkio Valley R. R.:											
Mortgage bonds... ..	June 1, 1880	June 1, 1920	210,000	.....	.....	.....	.....	.....	7	J. & D.	701.74
*Nodaway Val. R. R.:											
Mortgage bonds ..	June 1, 1880	June 1, 1920	188,000	.....	.....	.....	.....	.....	.....	.....	.....
COLLATERAL TRUST BONDS.											
C. B. & Q. R. R.:											
Sinking fund bonds (Denver exten.)... ..	Dec. 1, 1881	Feb. 1, 1922	7,968,000	7,310,200	136,600	.....	6,320,500	953,100	7	J. & D.	577.71
									4	F. & A.	44,414.35
PLAIN BONDS.											
C. B. & Q. R. R.:											
Sinking fund bonds	Sept. 1, 1881	Sept. 1, 1921	4,300,000	3,667,000	67,000	.....	3,546,000	54,000	4	M. & S.	7,261.31
Total			\$232,558,000	\$213,744,000	\$13,758,400	\$31,000	\$23,466,700	\$176,487,900	...	.....	\$6,960,493.46

*Note: These Bonds paid off and retired in December, 1916.

GENERAL BALANCE SHEET.

December 31, 1916.

ASSETS.

Investments:		
Property investment—Road and equipment:		
Road	\$373,469,973.19	
Equipment	79,495,314.91	
General expenditures	350,621.62	\$453,315,909.72
Sinking funds:		
Book assets	\$ 23,469,723.71	
Par value of Company's own issues	23,466,700.00	
included	3,023.71	
Deposits in lieu of mortgaged property sold	1,238,122.93	
Miscellaneous physical property		1,463,710.90
Investments in affiliated companies:		
Stocks	\$ 27,552,292.12	
Bonds	1,238,122.93	
Advances	1,797,535.34	30,587,950.39
Other investments:		
Stocks	\$ 9,127.91	
Bonds	152,538.00	
Notes	166,671.54	
Miscellaneous	35.00	328,372.45
Total investments		\$485,928,580.22
Current assets:		
Cash	\$ 19,848,417.83	
Demand loans and deposits	25,000.00	
Time deposits	12,346,500.00	
Loans and bills receivable	4,318,801.21	
Traffic and car-service balances receivable	788,947.88	
Net balance receivable from agents and conductors	3,896,880.26	
Miscellaneous accounts receivable	2,900,219.54	
Material and supplies	7,571,610.83	
Total current assets		\$ 51,696,377.55
Deferred assets:		
Working fund advances	\$ 26,114.38	
Other deferred advances	313,300.00	
Total deferred assets		\$ 339,414.38
Unadjusted debits:		
Insurance premium paid in advance	\$ 36,646.51	
Discount on funded debt	2,270,913.56	
Other unadjusted debits	4,033,682.22	
Total unadjusted debits		\$ 6,341,242.29
Grand total		\$544,305,614.44

INCOME ACCOUNT.

OPERATING INCOME.

Railway operating revenues:

Transportation:

Freight	\$77,310,516.00
Passenger	21,833,534.25
Excess baggage	248,822.67
Parlor and chair car	2,993.89
Mail	2,691,304.66
Express	2,854,713.02
Other passenger train	47,483.90
Milk	455,545.22
Switching	1,458,247.48
Special service train	37,522.31
	\$106,940,083.40

Incidental:

Dining and buffet	\$ 678,284.43
Hotel and restaurant	100,130.24
Station and train privileges	8,260.33
Parcel room	15,438.48
Storage—Freight	42,365.15

Storage—Baggage	18,891.74
Demurrage	388,408.57
Telegraph and telephone	258,556.09
Stock yards	326,798.52
Rent of buildings and other property	141,264.52
Miscellaneous	171,131.17
	\$ 2,149,529.24

Joint facility—Cr.	\$ 106,359.14
Joint facility—Dr.	4,767.29
	\$ 101,591.85

Total railway operating revenues: \$109,191,304.49

Railway operating expenses:

Maintenance of way and structures	\$12,203,096.81
Maintenance of equipment	17,053,851.51
Traffic	1,667,805.07
Transportation	32,014,949.04
Miscellaneous operations	1,013,164.78

GENERAL BALANCE SHEET.

December 31, 1916.

LIABILITIES.

Capital stock:		
Common stock		\$110,839,100.00
Long term debt:		
Bonds held by the public	\$176,487,900.00	
Bonds held by trustees, account sinking funds	23,466,700.00	
Bonds owned by the Company, unpledged	13,758,400.00	
Bonds owned by the Company, pledged	31,000.00	
Total	\$213,744,000.00	
Less bonds held by or for the Company, included in above	37,256,100.00	
Total long term debt		\$176,487,900.00
Current liabilities:		
Traffic and car-service balances payable	\$ 1,765,513.62	
Audited accounts and wages payable	6,397,244.63	
Miscellaneous accounts payable	435,338.74	
Insurance reserves	1,707,081.00	
Dividends matured unpaid	551.25	
Funded debt matured unpaid	5,000.00	
Unmatured interest accrued	1,079,167.50	
Other current liabilities	32,366.49	
Total current liabilities		\$ 11,422,263.23
Unadjusted credits:		
Tax liability	\$ 2,701,635.78	
Income reserves	1,409,144.70	
Operating reserves	440,000.00	
Accrued depreciation—Equipment	35,969,880.45	
Other unadjusted credits	1,945,434.90	
Total unadjusted credits		\$ 42,466,095.83
Corporate surplus:		
Additions to property since June 30, 1907, through income	\$ 40,527,499.29	
Funded debt retired through income	15,436,692.85	
Sinking fund reserves	24,079,659.03	
Appropriated surplus not specifically invested	8,564,856.78	
Profit and loss	114,481,547.43	
Total corporate surplus		\$203,090,255.38
Grand total		\$544,305,614.44

General	2,203,307.74			Rent for leased road	351,470		
Transportation for investment—Ct.	916,370.20	\$ 62,335,704.66		Miscellaneous rents	21,530.26		
Net revenue from railway operations		\$43,955,499.83		Miscellaneous tax accruals, Separately operated properties—Loss	13,585.26		
Railway tax accruals	\$ 4,820,197.37			Interest on funded debt	52,136.96		
Uncollectible railway revenues	35,314.88	4,856,312.23		Interest on unfunded debt	6,960,493.46		
Total operating income		\$39,098,987.58		Amortization of discount on funded debt	752.94		
NONOPERATING INCOME:				Miscellaneous income charges	55,163.52		
Hire of equipment	\$ 946,286.33			Net income	5.60	9,095,578.69	
Joint facility rent income	445,698.16			DISPOSITION OF NET INCOME:			
Income from lease of road	2,902.12			Income applied to sinking funds	\$ 1,864,186.81		
Miscellaneous rent income	171,994.24			Dividend appropriations of income:			
Miscellaneous nonoperating physical property	9,931.03			2 per cent March 25, 1916	2,216,782.00		
Miscellaneous income	1,302.25			2 per cent June 25, 1916	2,216,782.00		
Dividend income	40,353.04			2 per cent Sept. 25, 1916	2,216,782.00		
Income from funded securities	32,041.19			2 per cent Dec. 26, 1916	2,216,782.00	8,867,128.00	
Income from unfunded securities and accounts	1,337,350.59			Income appropriated for investment in physical property	8,864,595.48		
Income from sinking funds	3,457.81	2,991,316.76		Fund for accrued taxes—not yet due	2,400,000.00		
Gross income		\$42,090,304.34		Miscellaneous appropriations of income	6,000,000.00	\$27,996,010.29	
DEDUCTIONS FROM GROSS INCOME:				Income balance transferred to profit and loss		\$ 4,998,715.36	
Hire of equipment	\$ 221,792.24						
Joint facility rents	1,734,964.75						

COLORADO & SOUTHERN RAILWAY COMPANY—EIGHTEENTH ANNUAL REPORT

CHICAGO, January 1, 1917.

To the Stockholders of The Colorado & Southern Railway Company:

Herewith is submitted the Eighteenth Annual Report of your Board of Directors for the year ended December 31, 1916. In order to conform with the orders of the Interstate Commerce Commission, your Board of Directors amended the By-Laws of the Company so that the fiscal year begins on January 1st and ends on December 31st each year.

The following report sets forth comparative statements for the newly adopted fiscal period and combines the operations and affairs of the Lines operated by the Company named on the preceding page and which are herein designated as the

"COLORADO & SOUTHERN LINES."

FISCAL YEAR JANUARY 1 TO DECEMBER 31.

Per Cent.	1916.	OPERATING REVENUES.	1915.	Per Cent.
72.56	\$1,951,001.01	Freight	\$10,560,926.15	71.62
21.39	3,322,954.82	Passenger	3,260,469.11	22.11
1.42	233,182.07	Mail	235,172.84	1.60
1.32	217,427.69	Express	230,155.82	1.56
2.11	346,961.33	Miscellaneous	277,138.54	1.88
1.09	179,361.21	Incidental	166,762.71	1.13
.11	18,390.07	Joint facility	15,039.98	.10
100.00	\$16,469,278.60	Total operating revenues	\$14,745,665.15	100.00
		OPERATING EXPENSES.		
11.43	\$1,881,738.25	Maintenance of way and structures	\$1,944,310.58	13.19
17.13	2,921,367.31	Maintenance of equipment	2,769,214.07	18.78
1.30	213,672.29	Traffic	202,159.71	1.37
28.00	4,611,102.77	Transportation	4,604,376.93	31.22
.47	72,751.41	Miscellaneous	76,130.31	3.22
2.91	479,699.87	General	475,085.10	3.22
61.24	\$10,085,331.70	Total operating expenses	\$10,071,276.70	68.30
38.76	\$ 6,383,946.90	Net revenue from operations	\$ 4,674,388.45	31.70
	\$ 757,611.27	Railway tax accruals	\$ 666,183.56	
	716.83	Uncollectible railway revenues	299.19	
	\$ 758,328.10		\$ 666,482.75	
	\$ 5,625,618.50	Operating income	\$ 4,007,905.70	
		NONOPERATING INCOME.		
	\$ 631,545.89	Rents	\$ 509,968.42	
	90,615.49	Miscellaneous interest	58,101.45	
	\$ 722,161.38	Total nonoperating income	\$ 568,069.87	
	\$ 6,347,780.18	Gross income	\$ 4,575,975.57	
		DEDUCTIONS FROM GROSS INCOME.		
	\$ 333,733.78	Rents	\$ 491,008.70	
	2,860,338.95	Interest on funded debt	2,859,257.37	
	835.20	Interest on unfunded debt	1,728.82	
	18,600.06	Amortization of discount on funded debt	18,974.96	
	123,055.03	Miscellaneous income charges	96,856.18	
	\$ 3,336,553.02	Total deductions	\$ 3,467,826.03	
	\$ 3,011,227.16	Net income	\$ 1,108,149.54	
		DISPOSITION OF NET INCOME.		
	\$ 67,432.24	Appropriations for:		
	170,000.00	Sinking funds	\$ 68,301.22	
		Dividends		

290,250.33	Additions and betterments	
500,000.00	Miscellaneous appropriations of income	
\$ 1,017,652.57	Total appropriations of income	\$ 68,301,227.44

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HALE HOLDEN,
President.

GENERAL BALANCE SHEET—ASSET SIDE.

December 31, 1916.

INVESTMENTS.			
Investment in road and equipment.....	\$111,308,508.12		
Sinking funds.....	321.47		
Deposits in lieu of mortgage property sold.....	18,393.31		
Miscellaneous physical property.....	4,660.00		
Investment in affiliated companies:			
Stocks.....	\$ 449,709.94		
Bonds.....	8,760,000.00		
Notes.....	1,440,498.05		
Advances.....	30,281.77	10,680,489.76	
Other investments:			
Stocks.....	\$1,021,610.30		
Advances.....	420,021.05	1,441,631.35	
Total investments.....		\$123,454,204.01	
CURRENT ASSETS.			
Cash.....	\$ 2,682,200.64		
Time drafts and deposits.....	2,970,000.00		
Special deposits.....	137,904.33		
Loans and bills receivable.....	7,950.00		
Traffic and car service balances receivable.....	525,693.23		
Net balance receivable from agents and conductors.....	296,492.22		
Miscellaneous accounts receivable.....	425,003.80		
Material and supplies.....	1,333,355.93		
Rents receivable.....	18,785.29		
Other current assets.....	31,935.02		
Total current assets.....		\$ 8,329,320.46	
DEFERRED ASSETS.			
Working fund advances.....	\$ 1,475.15		
Other deferred assets.....	70,773.03		
Total deferred assets.....		\$ 72,248.18	
UNADJUSTED DEBITS.			
Rents and insurance premiums paid in advance.....	\$ 8,978.98		
Discount on funded debt.....	271,153.79		
Other unadjusted debits.....	69,775.52		
Securities issued or assumed—Unpledged.....	\$5,218,446.55		
Total unadjusted debits.....		\$ 349,908.29	
Grand Total.....		\$132,305,680.94	

GENERAL BALANCE SHEET—LIABILITY SIDE.

December 31, 1916.

STOCK.			
Capital stock:			
Common stock.....	\$ 31,021,484.00		
Preferred stock.....	17,000,000.00		
Total stock.....	\$ 48,021,484.00		
LONG TERM DEBT.			
Funded debt unamortized—			
Total book liability.....	\$67,634,346.55		
Held by carriers.....	5,218,446.55		
Actually outstanding.....	\$ 62,415,900.00		
CURRENT LIABILITIES.			
Traffic and car service balances payable.....	\$ 573,582.33		
Audited accounts and wages payable.....	992,929.02		
Miscellaneous accounts payable.....	5,596.51		
Interest matured unpaid.....	126,231.25		
Dividends matured unpaid.....	248.12		
Unmatured interest accrued.....	624,065.91		
Unmatured rents accrued.....	9,401.48		
Other current liabilities.....	156,783.21		
Total current liabilities.....	\$ 2,488,834.83		
DEFERRED LIABILITIES.			
Other deferred liabilities.....	\$ 7,284.18		
UNADJUSTED CREDITS.			
Tax liability.....	\$ 433,726.37		
Accrued depreciation—Equipment.....	5,043,187.51		
Other unadjusted credits.....	143,277.93		
Total unadjusted credits.....	\$ 5,620,191.81		
CORPORATE SURPLUS.			
Additions to property through income and surplus.....	\$ 6,498,972.87		
Funded debt retired through income and surplus.....	500,000.00		
Sinking fund reserves.....	34,742.63		
Appropriated surplus not specifically invested.....	2,000,000.00		
Profit and loss credit balance.....	4,618,270.62		
Total corporate surplus.....	\$ 13,651,986.12		
Grand Total.....	\$132,305,680.94		

INCOME ACCOUNT.

OPERATING INCOME.

Railway operating revenues:			
Transportation:			
Freight.....	\$11,951,001.01		
Passenger.....	3,522,954.82		
Excess baggage.....	28,372.04		
Mail.....	233,182.07		
Express.....	217,427.69		
Other passenger train.....	2,186.56		
Switching.....	304,010.55		
Special service train.....	11,461.34		
Other freight train.....	930.74	\$16,271,526.82	
Incidental:			
Dining and buffet.....	\$ 80,120.25		
Hotel and restaurant.....	1,760.25		
Station and train privileges.....	22,068.78		
Parcel room.....	1,359.73		
Storage—Freight.....	3,613.16		
Storage—Baggage.....	4,116.76		
Demurrage.....	50,632.66		
Rents of buildings and other property.....	7,159.17		
Miscellaneous.....	8,530.95	179,361.71	
Joint facility:			
Joint facility—Cr.....	\$ 18,436.89		
Joint facility—Dr.....	46.82	18,390.07	
Total railway operating revenues.....		\$16,469,278.60	
Railway operating expenses:			
Maintenance of way and structures.....	\$ 1,881,738.25		
Maintenance of equipment.....	2,821,567.31		
Traffic.....	213,672.29		
Transportation.....	4,611,102.77		
Miscellaneous operations.....	77,751.21		
General.....	479,699.87	10,085,331.70	
Net revenue from railway operations.....		\$6,383,946.90	
Railway tax accruals.....	\$ 757,611.27		
Uncollectible railway revenues.....	716.83	758,328.10	
Total operating income.....		\$5,625,618.80	

NONOPERATING INCOME.

Hire of equipment.....	\$ 319,813.13		
Joint facility rent income.....	30,028.04		
Income from lease of road.....	263,584.82		
Miscellaneous rent income.....	18,119.90		
Separately operated properties—Profit.....	1,634.32		
Income from unfunded securities and accounts.....	88,991.17	722,161.38	
Gross income.....		\$6,347,780.18	
DEDUCTIONS FROM GROSS INCOME.			
Hire of equipment.....	\$ 264,837.59		
Joint facility rents.....	55,274.46		
Miscellaneous rents.....	13,621.73		
Separately operated properties—Loss.....	33,636.22		
Interest on funded debt.....	2,860,328.95		
Interest on unfunded debt.....	835.20		
Amortization of discount on funded debt.....	18,600.06		
Miscellaneous income charges.....	89,418.81	3,336,553.02	
Net income.....		\$3,011,227.16	
DISPOSITION OF NET INCOME.			
Income applied to sinking funds.....	\$ 67,432.24		
Dividend appropriations of income:			
First preferred stock Oct. 10, 1916.....	170,000.00		
Income appropriated for investment in physical property.....	280,220.33		
Miscellaneous appropriations of income.....	500,000.00	1,017,652.57	
Income balance transferred to Profit and Loss.....		\$1,993,574.59	
PROFIT AND LOSS ACCOUNT.			
CREDIT.			
Credit balance at beginning of year.....	\$ 3,233,879.71		
Credit balance transferred from income.....	1,993,574.59		
Miscellaneous credits.....	40,613.03	\$5,268,067.33	
DEBIT.			
Dividend appropriations of surplus.....	\$ 527.68		
Miscellaneous appropriations of surplus.....	500,000.00		
Loss on retired road and equipment.....	9,935.04		
Miscellaneous debits.....	53,683.99	649,796.71	
Credit balance carried to balance sheet.....		\$4,618,270.62	

[Adv.]

Railway Officers

Executive, Financial, Legal and Accounting

F. A. Deverell, general auditor of the Cincinnati, Hamilton & Dayton at Cincinnati, Ohio, has been appointed assistant general auditor of the Baltimore & Ohio, reporting to the general auditor; W. E. Rittenhouse has been appointed assistant auditor merchandise receipts, reporting to the auditor of merchandise receipts, and J. G. Westbrook has been appointed special accountant, reporting to the general auditor. All with headquarters at Cincinnati, Ohio.

Morley Donaldson, vice-president and general manager of the Grand Trunk Pacific, at Winnipeg, Man., has resigned on account of ill health. He was born in Edinburgh, Scotland, on May 1, 1851, and was educated privately in France and Canada. He was for some time in the engine works of E. Gilbert & Co., Montreal, and later served under Walter and Frank Shanly during the construction of the Hoosac Tunnel, Massachusetts. In 1881 he entered the service of the Canada Atlantic as chief draughtsman, and later served successively as mechanical superintendent, superintendent of traffic and mechanical departments, and as general superintendent until the Canada Atlantic became merged with the Grand Trunk in 1905, when he became superintendent of the Ottawa division of the Grand Trunk. He was appointed vice-president and general manager of the Grand Trunk Pacific in 1912, and has been a member of the Canadian Society of Civil Engineers since 1889.

William Pittman Hinton, traffic manager of the Grand Trunk Pacific, at Winnipeg, Man., has been appointed vice-president and general manager, with headquarters at Winnipeg. He was



W. P. Hinton

born on August 30, 1871, at Ottawa, Ont., and was educated at Ottawa Collegiate Institute. On May 3, 1887, he began railway work in the auditor's department of the Canada Atlantic, and in September, 1891, became rate clerk in the traffic department. From March, 1896, to July, 1901, he was assistant general freight agent, and then was general freight agent, until his appointment in February, 1903, as general freight and passenger agent of the same road. In October, 1905, when the Grand Trunk absorbed the Canada Atlantic he became general agent in the passenger department of the Grand Trunk at Ottawa, Ont., in charge of immigration and transatlantic passenger traffic, remaining in that position until January 1, 1907, when he was appointed assistant general passenger agent of the Grand Trunk at Montreal. On May 1, 1909, he was appointed general passenger agent of the Grand Trunk Pacific at Winnipeg, Man., and in January, 1914, was promoted to assistant passenger traffic manager of the same road at Winnipeg. The following October he was promoted to assistant passenger traffic manager of the Grand Trunk and Grand Trunk Pacific lines, with headquarters at Montreal, Que. In November, 1915, he returned to Winnipeg as traffic manager of the Grand Trunk Pacific, having charge of both freight and passenger traffic; he was appointed at the same time to represent also the Canadian Government Railways with the title of western traffic manager, and now becomes vice-president and general manager of the Grand Trunk Pacific, also of the Grand Trunk Pacific Coast Steamship Company, Limited, with headquarters at Winnipeg.

Operating

R. King, assistant superintendent of the Canadian Government Railways at Winnipeg, Man., has been appointed acting superintendent, with headquarters at Fort William, Ont.; D. W. Steeper has been appointed acting assistant superintendent, with office at Graham, Ont.; J. H. Brassard has been appointed chief train dispatcher, with office at Levis, Que., and J. J. McLeod has been appointed chief train dispatcher at New Glasgow, N. S.

M. F. Leamy, trainmaster of the Delaware & Hudson at Albany, N. Y., has been appointed superintendent of the Saratoga division, with headquarters at Albany; L. A. Crounce succeeds Mr. Leamy; J. W. Nolan has been appointed assistant trainmaster, succeeding F. R. Griffin, assigned to other duties; H. S. Sloat has been appointed chief train dispatcher, succeeding Mr. Crounce, and C. E. Chubb has been appointed night chief train dispatcher, succeeding Mr. Sloat. All with headquarters at Albany.

C. R. Morrill, who has been appointed assistant general manager of the Southern Pacific at Houston, Tex., was born at St. Louis, Mo., on October 12, 1869, and entered railway service with the Southern Pacific in April, 1892, as a rodman, and served successively until 1897 as a chairman, draftsman and instrumentman. On the latter date he became roadmaster, and four years later was promoted to division engineer. In July, 1904, he became assistant superintendent, and in January, 1915, was appointed superintendent, with headquarters at Houston, which position he held until his appointment as assistant general manager.

Traffic

M. Walsh, traffic manager of the Georgia Coast & Piedmont at Brunswick, Ga., has resigned and the office of traffic manager, has been abolished. Effective August 8.

W. M. Hardin, whose appointment as general freight agent of the Minneapolis & St. Louis, with headquarters at Minneapolis, Minn., was announced in the *Railway Age Gazette* of



W. M. Hardin

August 10, was born at Independence, Mo., on May 3, 1878, and entered railway service in July, 1895, as a station helper on the Chicago & Alton. In the early part of 1898 he became telegraph operator with the Chicago, St. Paul, Minneapolis & Omaha, and in September of that year he went to the Minneapolis & St. Louis in the same capacity. Later he served successively as relief agent and traveling freight agent until January 1, 1909, when he was appointed commercial agent, with headquarters at Kansas City, Mo. On January

1, 1912, he was transferred to Minneapolis, and on November 1, 1915, was promoted to assistant general freight agent at Minneapolis, which position he held until his recent appointment as general freight agent, as already noted.

F. J. Parker, chief clerk to the general freight agent of the Michigan Central, at Detroit, Mich., has been appointed division freight agent, with the same headquarters.

Joseph W. Hickson has been appointed general Canadian freight agent of the New York Central, with headquarters at Toronto, Ont., in place of William A. Wilson, who has retired under the pension system.

S. G. Linderbeck, district passenger agent of the Seaboard Air Line, at Tampa, Fla., has been appointed division passenger agent, with headquarters at Jacksonville, and R. E. Camp has been appointed district passenger agent at Tampa, vice Mr. Linderbeck.

Lawrence Snapp, chief clerk in the passenger department of the Pittsburgh & Lake Erie, has been appointed assistant general passenger agent, with headquarters at Pittsburgh, Pa., succeeding W. B. Morris, resigned.

L. F. Vosburgh, general passenger agent of the New York Central at New York, has been appointed passenger traffic manager, and C. C. Howard, assistant general passenger agent at New York, has been appointed general passenger agent. Both with headquarters at New York.

F. La Bau, freight traffic manager of the New York Central at New York, has been appointed traffic manager; W. A. Newman, general freight agent at New York, has been appointed freight traffic manager, and G. C. Woodruff, division freight agent of the New York Central and the West Shore at Albany, N. Y., has been appointed general freight agent of both roads. All with offices at New York.

J. L. Amos, general agent of the freight department of the Missouri Pacific, with headquarters at St. Louis, Mo., has been appointed general freight agent, with headquarters at Kansas City, succeeding A. T. Stewart, resigned to become general traffic manager of the Sinclair Refining Company at Chicago; H. N. Atwood, general agent of the freight department at Milwaukee, Wis., has been transferred to St. Louis.

F. L. Jenkins, division passenger agent of the Southern Railway at Birmingham, Ala., has been appointed division passenger agent at Jacksonville, Fla.; G. R. Pettit, division passenger agent at Jacksonville, has been appointed district passenger agent at New York, N. Y., and T. J. Connell, division passenger agent at St. Louis, Mo., has been appointed special passenger representative at Atlanta, Ga.

The positions of New England freight agent, at Boston, Mass., and of commercial agent at Boston of the Seaboard Air Line, have been consolidated, and F. J. Cook, who was commercial agent at Boston, is now New England freight agent, with office at Boston; F. C. Cheney has been appointed commercial agent, at Greenville, S. C., vice N. M. Martin, resigned, and B. H. Hartley has been appointed commercial agent at Atlanta to succeed Mr. Cheney.

Bruce F. Moffatt, whose appointment as assistant freight traffic manager of the Minneapolis & St. Louis, was announced in the *Railway Age Gazette* of August 10, was born at Iola, Kan., on March 28, 1873, and entered railway service with the Iowa Central in 1893, in the local office at Marshalltown, Iowa. He served successively with that company in the auditor's office, the general freight department, and as traveling freight agent in Iowa. He later became commercial agent of the Minneapolis & St. Louis and the Iowa Central, at St. Paul, Minn., in which capacity he served until November 1, 1915, when he was appointed assistant general freight agent of the Minneapolis & St. Louis, with headquarters at Minneapolis, which position he held until his recent appointment as assistant freight traffic manager.

Engineering and Rolling Stock

H. A. Empie has been appointed general fuel agent of the Delaware & Hudson, with headquarters at Albany, N. Y.

T. L. Reed, master mechanic of the Seaboard Air Line at Hamlet, N. C., has been appointed master mechanic of the Georgia division, with headquarters at Howells, Ga.

Richard J. Vaughn, roadmaster on the Union Pacific at Evanston, Wyo., has been appointed general roadmaster, with headquarters at Omaha, Neb., succeeding Thomas Scott, resigned.

J. M. Grant has been appointed engineer maintenance of way on the Chicago, Peoria & St. Louis, with headquarters at Springfield, Ill., vice E. A. Froyd, who has been commissioned a captain in the United States Army.

A. L. Moler has been appointed master mechanic of the Saratoga and Champlain divisions of the Delaware & Hudson, with office at Colonie, N. Y., succeeding J. H. Stranahan, who has been transferred to the operating department.

W. Wells, division master mechanic on the Algoma district of the Canadian Pacific at Sudbury, Ont., has been appointed division master mechanic, with office at Schreiber, vice F. Grant transferred; T. Hambley, acting master mechanic at North Bay,

has been appointed division master mechanic, with office at Sudbury, vice Mr. Wells; and C. Gribbin has been appointed master mechanic, with office at North Bay, vice Mr. Hambley.

T. J. Skillman, division engineer of the Monongahela division of the Pennsylvania Railroad at Pittsburgh, Pa., has been appointed division engineer, office of the principal assistant engineer, New Jersey division, with headquarters at New York City, and W. F. Greene, division engineer of the Delaware division at Wilmington, Del., has been appointed division engineer, Monongahela division, with headquarters at Pittsburgh, Pa., succeeding Mr. Skillman.

H. S. Rogers, maintenance engineer of the Delaware & Hudson at Albany, N. Y., has been appointed division engineer in charge of maintenance of way forces on the Susquehanna division, with headquarters at Oneonta, N. Y.; F. C. Hohn has been appointed division engineer on the Pennsylvania division, with headquarters at Carbondale, Pa., and G. D. Hughey has been appointed division engineer on the Champlain division, with headquarters at Plattsburg, N. Y.

John J. Hanlin, whose appointment as assistant superintendent of motive power of the Seaboard Air Line with headquarters at Portsmouth, Va., has already been announced in these columns, was born on June 1, 1871, in Texas county, Missouri. He was educated in the common schools and in 1888 became an apprentice at the Birmingham Foundry & Machine Company, and four years later, on the completion of his apprenticeship, became a machinist on the Louisville & Nashville, remaining in that position until 1900. He was then appointed general foreman of the Birmingham Southern at Birmingham, Ala., and in 1904 became general foreman on the Seaboard Air Line at the same place. In 1907 he was appointed master mechanic at Atlanta, Ga., which position he held until his recent appointment as assistant superintendent of motive power of the same road, as above noted.



J. J. Hanlin

OBITUARY

Edward Dickinson, formerly receiver of the Kansas City, Mexico & Orient, died at his summer home at Miltons, Minn., on August 9. He was born at Cumberland, Md., on October 8, 1850, and entered railway service as a messenger in the freight office of the Cleveland & Toledo, at Cleveland, Ohio, in October, 1861. In 1865 he became telegraph operator on the Atlantic & Great Western, and in 1868 was promoted to assistant train dispatcher. For a short time in 1869 he was clerk and telegraph operator on the Union Pacific at Omaha, Neb., and in 1870 he became train baggage man and express messenger on the Atlantic & Great Western. In 1872 he was appointed train dispatcher on the Nebraska division of the Union Pacific, and served successively until July, 1890, as chief dispatcher of the Laramie division, superintendent of the same division, general superintendent of the Wyoming division, assistant general superintendent, general superintendent and general manager of the Missouri river division. On the latter date he became general superintendent of the trans-Ohio division of the Baltimore & Ohio, at Chicago, and one year later was appointed assistant general manager of the Union Pacific. In April, 1893, he was promoted to general manager, and in November, 1902, became vice-president and general manager of the Kansas City, Mexico & Orient, which position he held until March, 1912, when he was appointed receiver.

Railway Age Gazette

Volume 63

August 24, 1917

No. 8

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One of the fundamentals of the Y. M. C. A. organization is that the work and responsibility should be put squarely up to the members and boards of management by the employed officers. Too often the members discharge their responsibilities lightly and the brunt of the work is left to an overworked secretary and his staff. An emergency confronts the Railroad Y. M. C. A. of this country that will demand the very best service of every one of its members during the coming weeks; and it is fortunate indeed that the membership campaign that was carried on a year ago resulted in such large accessions to the membership of the various associations. The wartime activities of the R. R. Y. M. C. A. look not only to the needs of soldiers who may be engaged in guarding railroad property and to rendering service to groups of soldiers who may be camped in railroad centers where such associations are in operation, but also to looking to the comfort and convenience of soldiers in transit. With the movement of the National Guard into concentration camps and the gathering together during September of 687,000 men into the various cantonments, the extent of this work will be so great that if every member does not do his full duty, splendid opportunities for service will be neglected. The Y. M. C. A. has earned the admiration of the world because of the remarkable service that it has rendered to the soldiers during the war, and the railroad branch should take pride in the faithful discharge of the important assignment that has been made to it.

The Times (London) recently published a communication from a neutral observer who had returned from Germany, referring to the use of women workers on the railways of that country. In speaking of a group of women who were working at a railway junction as mechanics he said: "I must say that these women compelled my respect, for they seemed burly and healthy and not unhappy at finding themselves in the positions they now occupy." In commenting on the future of the women workers, however, this statement was made:

R. R. Y. M. C. A. Confronted with Big Task

"There is already much complaint about the moral conduct of women workers. I am told that in Westphalia, where prisoners of war and women work together in the mines, the most deplorable condition of things prevails." These matters are particularly deserving of attention at this time when so many women are entering railway service in this country. If these workers are surrounded by proper conditions there would seem to be little danger of the lowering of moral standards. The Canadian railways have employed women for comparatively heavy work in railway shops with excellent results. Undoubtedly they profited by a study of conditions abroad. For instance, it is very noticeable that they insisted from the very start on strict and high standards of conduct on the part of both the male and female employees in their relations to each other and that exceptional care was taken to provide in advance adequate and convenient rest rooms for the use of the women. In practically all cases these are in charge of what might be termed shop matrons, who assume not only the care of the premises but act in the capacity of matrons in looking after and keeping in touch with the women workers. England's experience has indicated that in order to secure the best results from women workers in shops and factories special care must be taken to avoid overwork and the rest periods should be maintained that are customary in times of peace.

No clearer statement of the necessity for American railroads to conserve and make full use of their locomotives and freight equipment could be made than that by Daniel Willard, president of the Baltimore & Ohio, in an address before the officers of that railroad, which was printed in our last week's issue. He showed that France and Russia will require about half the output of the locomotive builders in this country, and what transportation facilities mean to Russia in the prosecution of the war. If these facilities are not provided Russia may be forced to conclude a separate peace, thus releasing over two million German troops from the Eastern front for use on the Western front, and requiring

Women Workers on Railways

Increase the Efficiency of Cars and Locomotives

just that many more American troops at the Western front. The problem resolves itself, therefore, into one that affects our national existence. Russia must have locomotives and equipment if it is to do its part in the war, and we in this country must sacrifice, work harder and use what we have with greater efficiency in order that this equipment may be furnished that country. While engineers are planning and devising means of combating the submarine menace our railroad engineers and designers must plan and devise means of making locomotives and cars do more work. The cars must be kept in good condition and when repairs are made they should be done thoroughly so that the equipment will not spend an excessive time on the repair tracks. There are a large number of locomotives that can be made to do more work by the application of devices which will increase their power and hauling capacity and they can all be made to do their work efficiently if properly maintained. The mechanics in the shops, the inspectors in the yard and the repairmen on the repair track may play as important a part in the prosecution of the war as the men in the trenches. Each one must realize this and do his part unselfishly. With only fifty per cent of the output of our locomotive plants available for domestic use and with demands for transportation which cannot be met, the men at our "shop line front" have become important factors in the situation and no stone should be left unturned to have them thoroughly understand the responsibility that rests on their shoulders.

CONSERVE THE COAL SUPPLY

THERE is a great deal of talk about the need for conserving the food supply of the United States. There has not been so much talk about conserving the coal supply, but there is probably even more pressing need for doing so. The situation with respect to the coal supply which has developed since the United States entered the great war has become alarming. Attention has been called to one phase of it by a memorandum on the movement of coal to Lake Erie ports for trans-shipment by water to Duluth which Howard Elliott, a member of the Railroad's War Board, has made public, showing that the amount of coal which has been transported to the head of the lakes for consumption in the Northwest this fall and winter is much less than it was last year. As a result of representations made on behalf of the railways the government has ordered priority given to coal shipments to Lake Erie ports. This, however, is only one phase of a serious situation to which government officers, the railways, the coal operators and miners and the public should give immediate attention.

The railways within the four months April, May, June and July, moved much more coal in the country as a whole than ever before in any corresponding period. In April, 1917, they handled 20 per cent more anthracite and 22 per cent more bituminous coal than they did in April, 1916. In May they handled 24 per cent more anthracite and 27 per cent more bituminous coal than in May of last year. In June they handled 18 per cent more anthracite and 29 per cent more bituminous coal than in June of last year. In July they handled 19 per cent more anthracite and 34 per cent more bituminous coal than in July of last year. In April, May, June and July, 1916, they moved 2,297,290 carloads of coal, or approximately 115,000,000 tons. In the same months of this year they moved 2,951,054 carloads, or about 148,000,000 tons, an increase for the entire period over the same period of last year of 28 per cent. When it is considered that the amount of coal moved in 1916 was the greatest up to that time—in other words, that the railways have this year beaten their best previous record by 28 per cent—it will be seen that if the coal situation is not satisfactory this is not because the railways have not been exerting themselves to the utmost to make it so.

What, then, is the cause of the trouble? There are several causes. Two of the most important are the following: First, before the war a large amount of coal was transported by vessels on the Great Lakes and in coastwise service which have since been transferred to other service, with the result that there has been a very large increase in the part of the burden of carrying the country's fuel supply which has been thrown upon the railroads. Second, there has been an enormous increase in the demand for coal for carrying on the country's industrial and military activities. Another fact, which has especially affected the situation in the Northwest, has been that navigation on the Great Lakes began three weeks later this year than in 1916. This, based on 1916 figures, affected the coal movement from Lake Erie ports to the head of the lakes to the extent of 926,000 tons.

What are the remedies for the situation? To make sure that the great Northwest, for which the amount of coal loaded into boats at Lake Erie ports was 2,507,000 tons less during the first six months of the year than it was during the first six months of last year, will be provided with an adequate supply, Mr. Elliott, for the Railroads' War Board, has suggested that the federal government make use of some of the extraordinary powers recently vested in it, and the government has taken action accordingly.

In order, however, that the supply shall be made adequate to the needs of the entire country it is desirable not only that the production and transportation of coal shall be increased, but also that in all ways that are reasonable its consumption shall be curtailed. The railways themselves already have made a good beginning in this direction. They have reduced their passenger service at the rate of 20,000,000 passenger-train miles a year and have other reductions in contemplation which will make the total reduction about 30,000,000 a year. It is estimated that this will effect a saving of about 2,000,000 tons of coal a year. The railways are the largest consumers of coal, and perhaps they should and will have to go still farther in curtailing their passenger service as a patriotic measure for the saving of fuel.

Why should not other industries "do their bit" along this line by eliminating all unnecessary use of coal? Why should not also every family do a part of its "bit" by refraining from using any more coal than is necessary? As deficient as is the coal supply of the United States, the fuel shortage in European countries is far more acute. In every country which has entered the war and in every neutral country of Europe one of the most serious troubles to which the war has given rise has been the almost insuperable difficulty of getting enough coal to keep the railways and industries running and to keep the people from freezing. The best way for the people of the United States to secure partial immunity from coal shortage is to conserve the coal supply. The railways can do and are doing much to reduce the consumption and increase the movement of coal, but there is a limit to what they can do.

MINIMUM WEIGHTS, WAR NEEDS AND PATRIOTISM

IN our issue for August 3 we published an editorial entitled "State Regulation Interferes with Railroad Efficiency." It was based chiefly on a letter written by E. P. Ripley, president of the Atchison, Topeka & Santa Fe, to the Chicago Tribune, in which he criticised the state railroad commissions in the Middle West for, not permitting advances in the minimum carload weights on flour and other grain products to the basis allowed by the Interstate Commerce Commission—that is, 40,000 lb. In the present issue we publish a letter from Commissioner Dwight N. Lewis of the Iowa Railroad Commission, in which he criticises, not only Mr. Ripley's views on the subject of minimum carload weights, but also Mr. Ripley's attitude, or rather the attitude Mr. Lewis attributes to him, on railway regulation generally.

Mr. Ripley needs no defense from us, but we cannot let Mr. Lewis' criticism of him pass without saying that for many years he has stood forth as one of the ablest railway managers in the world, and that no railway manager in this country has been more public-spirited in operating his own railway or has done more to get railways generally operated in the interest of the public than he has. Furthermore, the charge that he has been "a most bitter opponent of railway regulation" is without foundation. He was one of the first among the heads of the large railways to recognize the fact that the Interstate Commerce Commission ought to be given the power to regulate rates, and, while he has been an opponent of certain kinds of regulation which have been especially prevalent in the Middle West, he has not been an opponent of regulation in itself.

Now, as to the specific subject discussed by Mr. Ripley and Mr. Lewis. It is well known—or ought to be well known—that the railways, owing to past unwise regulation and to conditions created by the war, are confronted by a traffic which has exceeded their capacity and which will soon be so large that they will be unable to handle it all unless they are able to move the maximum possible amount of freight with every freight locomotive and every freight car. In recognition of this fact, the railways, under the leadership of the Railroads' War Board, have been carrying on a nation-wide campaign to secure the maximum loading of cars and their prompt loading and unloading. A large part of the shippers of the country have responded to the appeals of the railways and are vigorously co-operating with them, but there are many shippers who are not doing so and who apparently will not do so unless they are forced to. The only way to force them to load heavier is to increase minimum carload weights.

Mr. Lewis, in his letter, refers to the opinion of the Iowa Railroad Commission rendered on July 23, 1917, in which the commission refused to permit an increase of the minimum carload weight on flour from 24,000 lb. to 40,000 lb. It was a matter of record in this case that the Interstate Commerce Commission had allowed a minimum weight of 40,000 lb. to be fixed on interstate shipments. It was also a matter of record, to quote from the opinion, that "there are practically no cars in active service on any of the larger systems of railways operating in Iowa of a capacity of less than 30,000 lb., and there are very few of less than 40,000 lb. to 80,000 lb. capacity." The commission found, however, that "the average local dealer in flour and other mill stuffs in the towns and villages of Iowa is running his business upon a very small capital, making it financially impossible for him to purchase a 40,000-lb. car of flour at the present abnormally high prices, also at the prices obtaining prior to the present application for an increase in the minimum weight; that a great many of said local dealers cannot now use the 24,000-lb. minimum except that a portion of a car may be made up of feed and other mill products." The commission decided that it would not allow an increase in the minimum because "we do not believe we would be justified in taking any action that would result in financial disaster to the mills now operating in Iowa, even though they are small and of limited capacity." It was shown that the larger shippers would not object to, but would even welcome, an increase in the minimum weight.

Commenting upon Mr. Ripley's criticism of the state commissions, Mr. Lewis says: "Because state railroad commissions are undertaking to save to the small shipper and to the consumer somewhat upon the cost of his living or the conduct of his business is no reason why such state commissioners should be considered less patriotic during this war period than the president of a railroad who, in the face of greatly increased earnings, insists upon higher rates and greater minimums. Working for his company, Mr. Ripley overlooks the fact that a railroad company is performing a public service and that there are times when the public in-

terest must be placed even above private ownership and large dividends."

These statements, coming from such a source, seem to express a want of understanding of the present railway situation that is little less than appalling. Mr. Ripley did not, in his letter from which we quote, argue in favor of an increase in minimum weights because it would tend to augment the earnings or reduce the expenses of his railroad. He did it upon the ground that the amount of traffic handled per car must be increased as a means of helping the nation in the present struggle. If the greatest possible utilization of railway equipment is not secured the railways will not be able to handle the country's business, and if they cannot handle the country's business the nation will be seriously hampered carrying on the war.

Mr. Lewis reminds Mr. Ripley that there are times "when the public interest must be placed even above private ownership and large dividends." True. But Mr. Lewis apparently overlooks the further fact that the welfare of the people of the United States must sometimes be put above the convenience and profits of a few small dealers in flour and mill stuffs in the state of Iowa. As a matter of fact, the railways in their efforts to secure the greatest utilization of equipment are trying to promote the interest, not only of the public in general, but also of the very shippers of flour and mill products in Iowa that the railroad commission of that state thinks it is protecting. If the railways do not secure the greatest utilization of equipment there will not be enough cars to go around, and, in consequence, these very dealers in flour and mill products in Iowa will not have enough cars in which to ship their commodities in carloads of 24,000 lb. or any other size.

It is a notable fact that the decision of the Iowa Railroad Commission denying an increase of minimum weights was rendered on July 23, 1917. This was over three months after the entrance of the United States into the great war. In other words, after three months of war, after three months of military preparation, after three months of explanation of the railway situation and of the reasons why it is what it is, it is still possible for the railroad commission of a great state to believe that it is acting in the "public interest" when it throws obstacles in the way of the railways in their efforts to secure the greatest efficiency in their operations.

Apparently, however, Mr. Lewis does not believe that increases in carloading are in the interest of efficiency. He says: "I recently talked with one of the high traffic officials of one of our western railroads and he stated as his opinion after several years' careful observation that the railroad companies, in their mad desire for larger cars, heavier locomotives and long trains, had become less efficient in the expeditious and economic handling of the traffic of the country." Either the "high traffic official," who expressed this opinion—whatever he may be—does not know the A B C of railway operating efficiency, or all the railway executives from James J. Hill down, who have made notable records in increasing operating efficiency have proceeded along wrong lines. If railway rates had been regulated as they have been by the Iowa and other commissions, and at the same time the great and to the promotion of the welfare, not of localities or of increases in carloads and trainloads had not occurred, every railway in the United States would have been bankrupt long before this. It is big carloads and trainloads that have made possible the present high wages and low rates. What is more important at this critical juncture, without the great increases in carloads and trainloads which have occurred the railroads could not possibly handle their present traffic with present facilities, and without still further great increases in carloads and trainloads within the next few months they will not be able to handle the vast additional traffic which will be offered to them.

By subordinating the efficiency of the railways, in this terrible crisis, to the supposed interests of a few of their local

constituents, the state railroad commissions of the Middle West are using their authority to help autocracy in the struggle against democracy, to aid the Kaiser to whip Uncle Sam. If that is not putting local selfishness, or politics, or something equally reprehensible above patriotism, we do not know how to describe it. The railway managements, by voluntarily subordinating the interests of their individual lines to the securing of the maximum efficiency of all lines states, but of the nation as a whole, are setting an example of disinterestedness and patriotism which many public officials seem unable to understand, much less to emulate.

NEW BOOKS

The Life of James J. Hill. By Joseph Gilpin Pyle. Two volumes. 958 pages, 8 illustrations, 6½ in. x 9½ in. Bound in cloth. Published by Doubleday, Page & Co., Garden City, N. Y.

A true estimate of the life of a great man cannot be conveyed through the medium of ornate and abstract eulogy. Fully cognizant of this fact, the author has recounted Mr. Hill's achievements in the many fields of activity which drew his attention, at the same time indicating the scope of his work, the catholicity of his interests and the genius he applied to every undertaking. The biography impresses the reader not only with the unremitting energy, rare foresight and consummate ability of the great railroad builder but with the fact that these qualities were translated into constructive results. Indeed, Mr. Hill was a great general of peace who mobilized large forces of men, materials and capital for the conquest of an empire from the wilderness. In fact, the history of the Northwest is in no small measure a chronicle of the work of James J. Hill.

How he first engaged in the transportation business when the rivers were the commercial highways of the Northwest, how he acquired the St. Paul & Pacific when it was nothing but two streaks of rust, extended it to Winnipeg and later by gradual stages to the Pacific coast, is related in detail. His important connection with the construction of the Canadian Pacific, his acquisition of the control of the Northern Pacific and the Chicago, Burlington & Quincy, the Northern Securities case, the crucial struggle with Harriman, and the Minnesota Rate Case are high points in his life to which a considerable portion of the biography is devoted.

Throughout his career, Mr. Hill displayed the qualities of an astute and sound economist. He thoroughly understood the relation between natural resources and transportation, and realized how necessary it was to foster the development of the agricultural, lumbering and mining industries in order to create railway traffic. He was foremost in introducing higher grades of seed, mixed farming, fertilization and improved farming methods in the Northwest. He was a pioneer in the conservation movement. Throughout his business career he showed a keen conception of sound financing and efficient management. Not a dollar of the capital of the Great Northern represents what is commonly termed "water." A few years before Mr. Hill's death he thoroughly reorganized the road's finances to insure it against all contingencies for half a century to come. He was often called upon to lend his assistance to corporations in which he had little or no interest. In this way he helped the Erie and the Baltimore & Ohio to shake off financial difficulties. Shortly before his death he established a great bank at St. Paul to emancipate the Northwest from dependence on Wall street during the crop moving season. In 1907, Mr. Hill saved thousands from financial ruin as well as privation by extending credit to farmers when banks generally had practically suspended operations.

He had an excellent grasp of issues confronting the country and was in constant demand as a speaker. When "trust busting" was the popular thing he summed up the real abuses of industrial combinations and their cure in an address before the Illinois Manufacturers' Association. He

said in part: "The valid objection to many concerns, especially some of those known as 'industrials,' is that they appear to have been created in the first place not so much for the purpose of manufacturing any particular commodity as for selling sheaves of printed securities which represent nothing more than the good will and prospective profits of the promoters. . . . Under the constitutional provision allowing Congress to regulate commerce between states, any company desiring to transact business outside of the state in which it is incorporated should be held to a uniform provision of federal law; namely, that all should satisfy a commission that their capital stock was actually paid up in cash or in property taken at a fair valuation, just as the capital of a national bank must be certified to be paid by the controller of the currency." The mere size of a corporation does not constitute a danger, he said, and may often result in distinct benefits to the workingman, consumer and capitalist in the shape of higher wages, lower prices and safer and more productive investments.

Mr. Hill was one of the first railroad men to realize the extent to which railroad development had been arrested by repressive legislation and regulation. In an address before the Merchants' Club in Chicago in 1906 he declared it the most important question confronting the country since the Civil War. In a letter to Governor Johnson of Minnesota in 1907, he pointed out the great disparity between the growth of traffic and the additions to railroad mileage and equipment. He showed that in the 10 years from 1895 to 1905 the total single track mileage of the country had increased but 21 per cent, locomotives 35 per cent, passenger cars 23 per cent and freight cars 45 per cent. In the same time passenger mileage increased 95 per cent and freight ton mileage 118 per cent. Improved facilities necessary to take care of the traffic of the country could only be built with more money, and more money could be obtained only if the railroads were permitted to earn the profits accruing from other forms of investment.

Mr. Hill was an individualist. He believed the functions of our national economy could be more efficiently discharged through private initiative than through government ownership or control. Government ownership of railroads, he maintained, would mean the death knell of democracy. An administration backed by the votes of 2,000,000 transportation employees would have unassailable power.

Proceedings of the American Railway Engineering Association. 1721 pages, illustrated, 6 in. by 9 in. Bound in half morocco, cloth or paper. Published by the American Railway Engineering Association, Karpen Bldg., Chicago. Price, half morocco, \$7; cloth, \$6.50; paper, \$6.

This is the largest volume of proceedings ever published by this association under one cover. The proceedings of 1911, published in three volumes, contain a few more pages. Of the total contents of the volume for 1917, 1,438 pages are devoted to committee reports, 141 to discussions on the floor of the convention and 142 to special papers and monographs. Following the general rule, the committee on rail presented the longest report which includes an extensive report on the quick bend test of rails as a substitute for the drop test, a paper on induced interior transverse fissures, and an account of tests of rail joints. The report on electricity comprises 182 pages, of which 152 are devoted to a preliminary report of the American Committee on Electrol-ysis. The Committee on Records and Accounts submitted a large number of forms for field and office use in valuation. Service records of cross ties occupied a considerable portion of the report of the committee on wood preservation. The miscellaneous papers included the full final report of the Joint Committee on Concrete and Reinforced Concrete, occupying 63 pages; a study of fuel consumption calculations; the electric power input on movable railroad bridges; and a reprint of a paper on the cost of railroad transportation, prepared in 1874 by Albert Fink.

Letters to the Editor

TWO ANSWERS TO "INITIATIVE—ORGANIZATION AND EDUCATION"

DETROIT, Mich.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I am not in sympathy with the letter entitled "Initiative—Organization and Education" and signed by "Observer" published in your issue of August 10. Railroads of today are handled by rule. It is not expected of a junior officer to do what he knows to be good railroading, without the sanction of his superior officer, if the action is in conflict with the approved practice or system. It would not be possible to have system if junior officers were permitted to use their judgment in conflict with the general policy. Such a method, by which the judgment of inexperienced officers (as junior officers are usually), would result in chaos. It is only in recent years that railroads have become cognizant of this fact and have profited through efficiency measures and system.

What the writer says about nepotism might have been true under the old method of railroading, but it is not true today. With reference to the general superintendent who, over the heads of the superintendent, trainmaster and yardmaster, dismissed a couple of his engine foremen from one of his yards,—this might happen in one case out of a hundred. As to assigning to an agent authority to put on and take off help ad libitum this, in my judgment, would be unwise.

The greatest problem confronting railroad officers of today is to educate the old employees, rather than the new ones, into new methods. Safety in transportation is the first essential. If officers and employees make it their business to observe carefully the rules and regulations and devote their energies toward expediting the company's business along these lines, they will have done all that should be expected of them.

I consider this presentation unwise and harmful to young railroad men and junior officers. The facts are that it would not be possible for an officer of a railroad, under the old method, to "reach first base" today.

FRANK H. ALFRED,
President, Pere Marquette Railroad.

MONTREAL.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I have read Observer's letter on "Initiative—Organization and Education," in the August 10 issue, and I would like to say to Observer, "Well done."

I do not believe he is the kind of man who will worry over what a few self-sufficient, all-sufficient men in the railway service will say about his letter and his views generally. These are the men who should read this letter many times, but unfortunately they won't. Men who practice the methods he condemns will not learn, but that is not Observer's fault. He could have gone further than he has in pointing out how the initiative is destroyed, for he has failed to mention the cases where the favorite is given the credit and money due to the man who has but his work to recommend him.

There is also the official whose personal office staff can do no wrong and who never learns the great harm these lick-spittles are doing his railway. Here is a case I have personal knowledge of, I know both the man and one or two of his clerks. The man was a district freight agent with a large number of local agents reporting to him. He would find that an agent was not following out instructions as per

circular No. 00, and would call on his staff to show that the agent had received the circular. They found that through their neglect the circular had not been sent to the agent. Knowing the man they had to deal with they simply forged a receipt of acknowledgement for the circular and handed it in. The agent, or perhaps a number of agents, would then receive one of those "stingers" for which the "old man" was noted. What a loyal lot of fellows they would be for the next six months, and by that time there would be more of the same thing from the same source. These men in the mass are more important to the railway than the district agent, and individually better men than the members of his office staff.

I say again, well done Observer, let us hear from you again, and while on the subject take a look at other lines of business to see if by any chance they are all free of the evils mentioned. It is poor human nature that Observer is gunning for. Why train his "75" on the poor railway? Try a shot at the other fellows and see what you bring down.

ANOTHER OBSERVER.

COMMISSIONER LEWIS REPLIES TO MR. RIPLEY

DES MOINES, Ia.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I have long been a reader of your magazine and have always regarded it as one of the strongest, if not the strongest, railway magazine we have. Perhaps because I have always so highly regarded it, is the reason I now desire to take exception to a recent editorial.

In your issue of August 3, on page 176, is an editorial comment on the various minimum weights applying on flour and other mill products in carloads, as promulgated by a number of states therein named.

E. P. Ripley, president of the Atchison, Topeka & Santa Fe railway, whom you quote, has been a most bitter opponent of railway regulation. He is a good controversialist, and were it not for his persistent "anti" attitude his ability and long years of experience should give his opinion much weight with every one. It is true with him, however, as it is always true with those whose prejudices are permitted to color their argument, that his statements will not always bear close and careful scrutiny.

It is no argument for Mr. Ripley to cast aspersions upon the character of men who may be members of state commissions, however true his accusations might be, if those commissions, in the performance of their duties, have rendered decisions or made orders in accordance with the evidence submitted. Your editorial is occasioned by the action of the Kansas Commission in refusing to advance the minimum on flour beyond the 24,000 lb. limit, yet your comments are general. This Commission, too, has but recently declined to grant an increase in the minimum on flour, and it remains at 24,000 lb.

I do not desire to enter into any controversy with Mr. Ripley. If he believes he is best serving the public and the interests of his company by slandering state railroad commissions and continually objecting to regulation, then I leave the field to him. I do not, however, like to see so good a paper as yours accept the unsupported statements of Mr. Ripley as a basis for an assault upon state railway regulation. It may be you are right and that state regulation should be abolished; however, this will never be done upon anything Mr. Ripley may ever say upon the subject.

I but recently talked with one of the high traffic officials of one of our western railroads, and he stated as his opinion, after several years' careful observation, that the railroad companies, in their mad desire for larger cars, heavier locomotives and long trains, had become less efficient in the expeditious and economical handling of the traffic of the

country; that shorter trains, more frequent service and less insistence on enormous carloads, would move the traffic faster, cheaper and more satisfactorily. Of course, he did not mean going back to the small and inefficient cars or locomotives, but what he meant was, that loading and service should be based more largely upon the commercial needs of the country, rather than upon the possible ability of a carrier to handle immense trains and heavier carloads.

I note by the press despatches today the railroads of the United States have increased their net earnings in June, 1917, eight million dollars more than the figures show for June in 1916. Of course, you will remember 1916 was the best year the railroads ever had. The carriers are to be congratulated upon their splendid showing. But, because state railroad commissioners are undertaking to save to the small shipper and to the consumer somewhat upon the cost of his living or the conduct of his business, is no reason why such state commissioners should be considered less patriotic during this war period than the president of a railroad who, in the face of greatly increased earnings, insists upon higher rates and greater minimums. Working for his company, Mr. Ripley overlooks the fact that a railroad company is performing a public service, and that there are times when the public interest must be placed even above private ownership and large dividends.

I am enclosing you a copy of our decision in the minimum weight case. I ask as a favor that you read this opinion, as it not only gives our conclusions, but the evidence upon which such conclusions are based.

DWIGHT N. LEWIS,
Member, Iowa Railroad Commission.

GOVERNMENT OWNERSHIP AND RAILWAY RATES

TARRYTOWN, N. Y.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The New Republic, in an editorial on government ownership of railways appearing some time ago, advocated the theory that it is impossible for the public and the government to co-operate sympathetically with the railroad managers, and that the failure of railroad credit will eventually force the issue. While the recent rate decision seems to give point to such a belief, there is the possibility of a complete reversal of attitude by the Interstate Commerce Commission after the appointment of three new members. Moreover, the intimate relations that are now being developed between the government and the railroads through the railroads' War Board should surely aid in bridging the chasm.

The New Republic's latest editorial in the issue of July 21, however, evolves the unique principle that rate-fixing, being inherently a form of taxation, is therefore easily adapted to exploitation by governmental agency for the purpose of stabilizing the operation of the whole industrial and financial system.

Such a theory has little of value, but the very novelty of the argument makes it of interest. It is said that rates based on what the traffic will bear include "a charge for service and an additional charge that is essentially . . . one of the least burdensome forms of taxation, resting mainly upon unearned increment." The idea of unearned increment cannot in any true sense be applied to railway traffic as a whole, probably not to more than a small portion of the traffic. Of course, it is true that half or more of the tonnage of the average road consists of coal, lumber, etc.—commodities subject to monopoly at the source. But it is also true, I believe, that the railroad rate, though it may in a sense be called a tax, is borne more largely by the consumer than by the producer. It is easily shifted except in cases where relocalization of industry is possible.

It is not true that the average rate now consists of "a charge for service and an additional charge that is essentially of the nature of taxation." Our whole rate system is honeycombed with inconsistencies—in fact, there is no system worthy of the name. There is no "charge for service" in the sense of a cost basis. The railroads do not know what the traffic costs to handle. When the Commission fully understands the scope of its duty it will, perhaps, inaugurate a national rate system based on the cost principle rather than the tax idea—with regard, however, to the present distribution of manufacturing. Our greatest industry would then be placed on a basis of efficient relation to other industries; but such a step will require many years to develop, and there is danger in too rapid a change from present bases.

The problem of cyclic changes—periodic booms and depressions—would not be solved, as the New Republic hopes, by a system whereby railroad rates would be placed on a sliding scale. This involves the assumption that the government should become a general clearinghouse of industry, which is hardly tenable except under war conditions or a socialistic regime. The issue of prosperity vs. depression is purely a problem of credit and finance (subject of course, to political and international factors), and must be regulated as such. Moreover, an attempt at control through exploitation of railroad rates would merely thrust us on another horn of our national dilemma—the high cost of living.

The idea of using the railroad rate in a dual function of "diverting to the public treasury part of the excess profits of boom times" and of "abating the evils of speculation and unmerited enrichment" is, indeed, too fanciful for serious consideration, and deserves attention only because it appears in a journal said to be the best exponent of modern politico-economic conditions. Taxation must be based on simple principles and applied at the source; and there are many ways of despoiling monopoly of its ill-gotten gains, if we will only courageously adopt them. To use the rate-tax principle would not only befog the issue as to the fair distribution of wealth, but would deprive industry of its only stable and dependable set of values.

The welfare of the railroads themselves must always be considered as the paramount issue. Of course, if rates are to remain stationary without respect to a steady decline in the purchasing power of the dollar, the government must ultimately (and perhaps not far in the future) use its superior credit to finance the needs of the railroads; but that does not necessarily imply government ownership, although it may be considered an unwise and dangerous step toward the adoption of that policy.

OWEN ELY.

HALF PORTIONS ON DINING CARS

INDIANAPOLIS, Ind.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I notice in your publication of July 13 reference to the relative merits of a la carte and table d'hôte.

I have wondered many times, since war began and prices commenced to go up, why a similar arrangement did not work on dining cars as obtains in many of the restaurants where a la carte obtains and half portions are served so that parties can order according to their appetite.

Thus: If a whole portion of ham and eggs a la carte is 75 cents, would it not be economical to serve a half portion of ham and one egg at say 40 or 45 cents; one whole order of French fried potatoes, 25 cents and half portion, 15 cents.

Many times, while eating on the diners, a large portion of my dinner has gone back to the kitchen on account of the portions being too large.

FREQUENT TRAVELER.



New Line Along the North Side of the Canyon East of Castle Rock

Second Track Work on the Union Pacific

Heavy Grade Revision Was Made in Connection with the Improvement of a Dense Traffic Line in Eastern Utah

THE Union Pacific is now completing the construction of a section of second track in eastern Utah which is of unusual interest because of the difficult problems presented. This work comprises the last 16 miles of the 75-mile climb east from Ogden to the crossing of the Wahsatch mountains. The construction work is very heavy, involving an expenditure of more than \$3,000,000, or nearly \$200,000 per mile,

growing rapidly during the last few years and was unusually heavy during the last year, averaging 12,500 gross tons westbound and 13,500 tons eastbound daily for combined freight and passenger movement. However, in the fall of 1916 a maximum daily movement of 26,000 tons eastbound and 11,000 tons westbound was handled. This eastbound movement required 17 trains and the westbound 8 loaded trains,



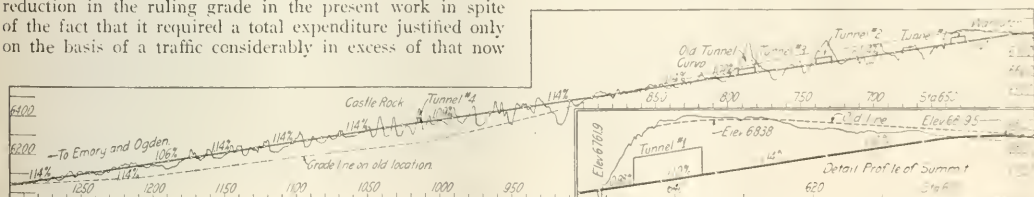
Location of the Old and New Lines in the Echo Canyon

and was undertaken primarily because of the congestion resulting from the heavy traffic and the pusher engine movements down the hill.

Since the character of the country is such that the construction of a second track on the present location would commit the railway to so large an investment that subsequent grade revision or other improvement would necessarily be set very far into the future, it was decided to include the reduction in the ruling grade in the present work in spite of the fact that it required a total expenditure justified only on the basis of a traffic considerably in excess of that now

5 light extras and 21 light engine movements. In addition to this there were 6 passenger trains in each direction.

The new work involves the portion of the line between Emory, Utah, and Wahsatch, where the old line was located up the Echo Creek canyon in 1864 by Samuel B. Reed. The existing line occupies the original location and will continue in operation under the new plan as the westbound



1.11 per cent, while the climb for the remaining distance necessitates a maximum grade of 1.77 per cent.

The new track is parallel to and 14 ft. north of the old one for the first $2\frac{1}{2}$ miles east of Emory, but for the remaining distance it is on an independent location along the north side of the canyon, where it was possible to obtain support in the vicinity of Castle Rock at a sufficient elevation to secure a grade of 1.14 per cent compensated for the entire distance. The location along the north side of the canyon was also governed partially by the fact that this side receives much more sunlight and is therefore less subject to disadvantageous winter conditions.

The new line is an improvement over the old one in other respects than grades. It is 0.342 miles shorter, the curvature is less by 757 deg., and the total length of curves is 5.7 miles as compared with 7.65 miles on the old line. The maximum curve is 3 deg. as compared to 6 deg. The reduction in rise and fall is small, only 17.48 ft.

As seen on the profile, the situation at the summit is rather unusual. The physical features of the saddle in the mountains at Wahsatch are such that no material reduction in the elevation of the tracks could be accomplished. The improvement in the grade line was secured partially by moving the summit on the new tracks about 3,800 ft. east of that for the old one. Here the two tracks are practically at grade and while the old line remains on the surface for



The Summit Cut—Old Line on the Surface to the Right

almost a mile to the west, the new line descends into a cut which has a maximum depth of 65 ft. at the lower end where it terminates in a tunnel 1,500 ft. long. This tunnel has a maximum over burden of only 35 ft. and is crossed by the old line in a cut about 5 ft. deep.

The grading of the new line is largely in the nature of side hill cuts through cliffs, containing a variety of materials varying from hard sandstone to shale with relatively short high fills in the ravines between. Some of the cuts, particularly in the vicinity of Castle Rock and further west, are over 100 ft. deep, although they contain relatively small quantities of material. One exception to this is an embankment between Castle Rock and Curvo, which is 113 ft. high and contains nearly 1,000,000 cu. yd. of material in a length of less than 1,000 ft. Another exception is the summit cut referred to previously which required the removal of 275,000 cu. yd. of material. There are four tunnels, the longest being tunnel No. 1 near the summit and they form an interesting feature of the project.

EMBANKMENT WORK

Owing to the fact that the bottoms of the ravines contain earth that could be handled economically while the cuts were

largely in rock, the grade line was established with a considerable excess of material in the embankments so that, in general, material borrowed from the bottoms was used very largely in the bases of the embankments and the material from the cuts was used principally for the upper portions of the fills. In some cases the embankments were made almost entirely from borrow, one of 175,000 cu. yd. near Castle Rock taking only 25,000 cu. yd. from adjoining cuts. In nearly all cases the borrowed material was taken out with Fresno graders working over relatively large areas



Typical Embankment Work

with limited depths of pits. This work followed common practice as a rule, but in one or two cases wagons were used having a capacity of 4 cu. yd. The team outfits were an important factor in the work on this project and a number of good records were made. In one fill of 125,000 cu. yd. west of Tunnel No. 1, a record of 1,200 cu. yd. in 10 hours was made with one grader hauled by 16 horses and served by 12 two-horse wagons.

One advantage gained by borrowing a large part of the



125-ft. Cut—"Daylighted"

material in the hills from pits in the bottom was that the making of the lower lifts by teams reduced the height of trestle required for unloading the material coming from the cuts. Part of one side hill embankment was made by a steam shovel casting directly while excavating the roadway necessary for it to reach the required elevation for the first cut. The material in the fills is of a character that will

not roll to a $1\frac{1}{2}$ to 1 slope from a trestle or over the edge of the embankment but will gradually assume that slope through the action of wind and frost. On this account the contractors were not compelled to produce a fill of standard dimensions, but the top width was made sufficient to insure a full section after natural agencies had become effective. A shrinkage allowance was made only in the width of the roadbed, the embankment being allowed to stand over the winter and the grade then restored for any settlement by raising it in the spring.

The largest single feature in the earth work was the building of the 1,000,000 cu. yd. embankment near Curvo.



The Large Fill Near Curvo

This is nearly 500 ft. wide at the bottom and was made in three lifts, the first of 30 ft. or more and the second and third of 42 ft. each. Twenty-foot berms were provided between the lifts on each side. Three steam shovels were employed for a part of the time to make this embankment, but the program of the work as carried out was equivalent to the continual performance of the two 70-C Bucyrus shovels from April 20 to November 18, working two 10-hour shifts daily. In addition to the work done by the shovels a total of 100,000 cu. yd. was placed by two Fresno grading outfits working partially on the bottom lift but principally on the

to a considerable extent because there was a marked variation in the character of the material encountered in close proximity.

The side hill cuts were daylighted whenever this could be done with the removal of not over 10,000 cu. yd. of additional material. The contractors were required to trim the slopes to the neat section and were cautioned particularly to avoid over-cutting. This was done to eliminate irregularities that would eventually lead to slides, washes or rock falls. Other special measures were also taken to overcome this last danger. One of the illustrations shows a cut having a face 125 ft. high that was provided with a bench 15 ft. wide

40 ft. above grade, in addition to which the slope was carefully cleaned by hand while the lower portion was scraped by the steam shovel to remove all loose rock. The daylighting of this cut produced a shelf 90 ft. wide. The slopes of all cuts were made 1 to 1.

The summit cut contained 275,000 cu. yd. principally of rock, although 5 ft. of black soil was encountered near the upper end. Most of the material was wasted. As this cut was arranged to drain through the tunnel at its lower end and as excavation was in progress long before the tunnel was completed, it was necessary to install pumps to remove



The New (Right) and Old (Left) Tracks Near Castle Rock

west end of the top lift. The material for this team work was secured close at hand but it was necessary to go a mile from the fill to secure borrow pits containing suitable material in adequate quantities for the shovels. The shovels were served by 4-yd. dump cars handled in 12-car trains by 20-ton locomotives on 3-ft. gage track.

INTERESTING EXCAVATION METHODS

The excavation in the cuts was troublesome because of the difficulty experienced in drilling and shooting the harder classes of rock encountered. The work was also hampered

the water during construction. Notwithstanding this the steam shovels mired badly and resort was had to a drag line excavator working from the top of the slope. This machine was employed successfully to load 30,000 cu. yd. into 4-yd. dump cars that were used to haul the material away.

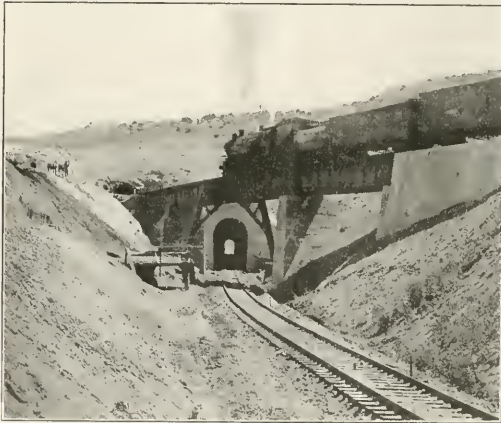
TUNNEL WORK

Tunnel No. 1 was driven through material of a character that required immediate timbering. Consequently a top heading was adopted, with a cross section that permitted

the erection of the full arch at once, down to the level of the wall plates on either side. Following the placing of this timbering, the benches were shot down and the muck from both the heading and the bench were loaded by an air-operated shovel into small cars handled by gasoline locomotives.

Jack hammers were employed throughout, using 16 holes 8 ft. deep in the heading which removed about 6 or 7 ft. of face to the shot. In some of the soft material it was possible to use augers in place of drill bits. Air for the tunneling operations was supplied by a plant containing three two-stage steam air compressors having a combined capacity of 1,440 cu. ft. of free air per minute to 100 lb. per sq. in., steam being supplied by four 100-hp. boilers.

Tunnel No. 2, which is 1,100 ft. long, pierces rock of sufficient stability to make a lining unnecessary at the start, but as the rock disintegrates on exposure the tunnel will be lined with concrete. As a measure of temporary safety a set of posts and segments were installed every 8 ft. The tunnel was driven with a bottom center heading 10 ft. wide by 12 ft. high with the bottom 4 ft. above subgrade. This was advanced by 25-ft. holes in the face, drilled with jack hammers with a crew of 10 men—two drillers, four muckers and four mule drivers—the average progress being about 17



New Line Crossing Under Old at Tunnel No. 2

ft. per day. The enlargement was made by drilling 20 radial holes at intervals of 5 ft. along the tunnel, the 7 upper ones being drilled by a stoep drill and the 13 lower ones with jack hammers. The bottom holes, which were drilled 6 in. below subgrade, were shot first about 75 ft. ahead of the upper holes, from 2 to 4 rings being shot at one time. The muck from the enlargement was taken out with an air-operated steam shovel that averaged about 20 ft. of advance per day. The air used in the tunnel work was supplied by a plant which also furnished air to the work on tunnel No. 3 only about a mile distant.

A peculiar situation obtains at tunnel No. 3, which is on a tangent parallel to and 81.5 ft. south of the tangent of the old Wahsatch tunnel of the original line with the new grade 41 ft. lower than the old one. This is shown in one of the illustrations. At the west portal the new line crosses under the old one on a flat skew, the old line being carried on a viaduct consisting of four 60-ft. deck girder spans supported on masonry abutments and two intermediate masonry piers, while the center support consists of a steel bent with a long cross girder placed astride of the new track passing underneath.

The site of this bridge is over a cut that had to be taken out before the structure could be built. The work was further complicated by a change in the alinement of the old track to replace a 5-deg. curve by one of 4 deg., a measure involving the shortening of the old tunnel by 80 ft. These tunnels are just east of Curvo which derives its name from a series of 10 reverse curves in a distance of two miles. As it has been suggested that some of these curves be eliminated by tangents on embankments between the adjacent



Tunnel No. 4

convex curves, the spoil from the new tunnel and its west approach cut was wasted where it would be applicable for this possible future purpose.

Tunnel No. 4 is 200 ft. long, extending through a short shoulder in the bluff near Castle Rock. It was driven entirely by hand work, using a center bottom heading into which the muck from the enlargement of the arch was trapped. The benches on either side of the heading were taken out last. The tunnel was lined with concrete throughout.

A LONG CULVERT WAS REQUIRED

With the exception of a viaduct at tunnel No. 3 all structures on this project are arch culverts. The largest of these



16-ft. Arch Culvert Under 1,000,000-cu. yd. Embankment

is a structure of 16 ft. span under the 1,000,000-cu. yd. embankment, having a length of 464 ft. Owing to the heavy load which was imposed by the high embankment, it was deemed desirable to put this culvert on rock foundation and to accomplish this in a location that would give

the culvert a minimum length of barrel, 50,000 cu. yd. of excavation was required. The culvert contains 4,200 cu. yd. of concrete and is reinforced with 60-lb. rails curved to the shape of the arch. The concrete materials were brought to the site on a spur track carried nearly a mile from the old main line. The materials were unloaded from cars to storage piles by a locomotive crane and were transported to two $\frac{3}{4}$ -cu. yd. Smith mixers in wheelbarrows. The concrete was delivered to the footings by chutes and to the neatwork by tram cars running on a trestle at a sufficient height to permit dumping directly into the forms. These cars were loaded by a bottom dump bucket lifted from the mixer to the level of the cars by a stiff leg derrick.

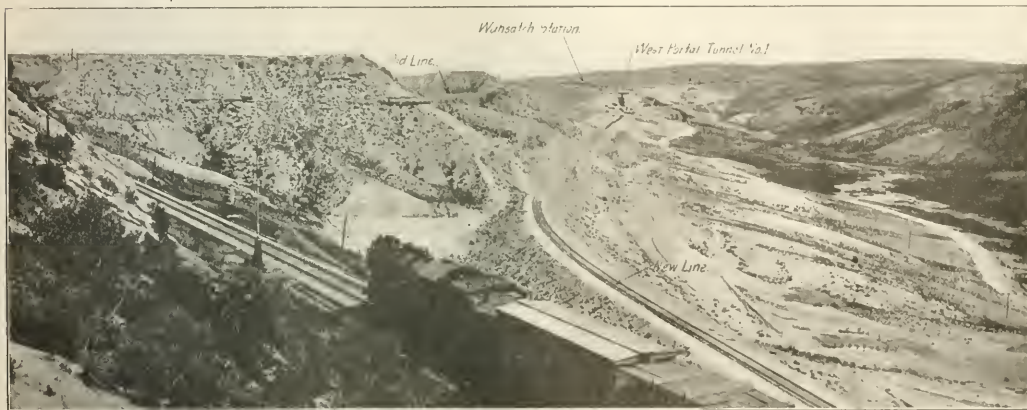
CONSTRUCTION ARRANGEMENTS

The general contract for construction work was awarded to Kilpatrick Bros. & Collins of Beatrice, Neb., who divided the work among 10 sub-contractors on a joint account basis under which the general contractor shared equally with each sub-contractor in the net profits of the work. In general, the basis of payments for the excavation and embankment work was a schedule of unit prices for earth and classified material with definite overhaul allowances, applicable both to excavation in embankment and in borrow pits. With

TRANSPORTATION OF NATIONAL ARMY TO TRAINING CAMPS

Plans for the largest movement of troops by railroad in the history of the country are now being perfected by the American Railway Association, at the request of the United States government. The citizens selected to form the National Army will begin to move to their respective training camps on September 5. The number to be selected stands at present at 687,000 men. The first movement will consist of approximately 30 per cent from each local concentration point, a total of about 200,000 men, and will begin on Wednesday, September 5, this date having been selected in place of an earlier date, at first considered, which would have brought the movement at the time of the rush of traffic incident to the Labor Day holiday. Entrainment is to be completed on Sunday, September 9. It is expected that a second movement of 30 per cent, or 200,000, will take place beginning on September 19, continuing for four days thereafter; and that a third movement of 30 per cent will begin on October 3, to continue for four days.

While plans for the National Army mobilization are being perfected the railroads are engaged in the movement of the National Guard to their training camps, which began



The Old and New Lines—Looking East Toward Wahsatch

these schedules as a guide the engineers determined where the material was to be obtained to secure the cheapest embankment, each situation demanding its individual solution. The large embankment referred to previously was paid for on a flat price per cubic yard of borrow pit measurement, independent of the haul. The tunneling was paid for at a flat price per cubic yard of neat section.

This construction work has been under the direction of R. L. Huntley, chief engineer of the Union Pacific, with W. S. Woodworth, engineer in charge, the resident engineers being W. G. Tinney, H. C. Mann and F. W. Newhart. The entire project has been under the general supervision of E. E. Adams, consulting engineer of the Union Pacific System, New York City.

FUEL SITUATION IN RUSSIA.—The Russian fuel crisis, which became marked in 1916, has grown more acute this year. It is aggravated by the deterioration of the railway locomotives, which causes them to require a constantly increasing share of the fuel available for industrial purposes. The railways and the navy now require 60 per cent, and this proportion is expected to be increased steadily until the railways are bettered.

last week and will continue in increasing volume until all have moved. This movement will include approximately 350,000 men and their impedimenta. The movement of troops and supplies to the seaboard for service abroad has also been in progress for some time but details regarding the transportation and as to the number of men involved must not be published.

A total of 4,531 points in the United States have been designated by the Provost Marshal General as points of local concentration for the draft army, at one of which each individual will be required to report at a stated time and from which the parties will proceed by railroad to the 16 cantonments to which they have been assigned. The Provost Marshal General, through the state authorities, will retain control of these men until they are placed upon the trains designated, and will designate a man in each party to be in charge of it from each local concentration point to destination.

The American Railway Association has been directed to prepare schedules for the movement of each of these parties. These schedules are being prepared by the passenger associations in conference with representatives of the operating departments. They will show the date and hour at which

trains, either regular or special, may be expected at each local concentration point to receive the men departing from such point, together with schedules through to destination in each case. When these schedules have been approved by the quartermaster-general they will be furnished from the Washington office of the Railroads' War Board to all railroads and others interested in the movement.

The individual in charge of each party will hold tickets for each member of the party and will also be furnished with meal tickets, each having a face value of 60 cents, sufficient in number to provide for the food of all the men under his charge.

In preparing schedules due regard will be paid to the necessity for providing for the feeding of these men at convenient points, either by use of eating houses, dining cars, or by furnishing box lunches on the train. The meal tickets are redeemable at their face value on presentation to the department quartermaster at the headquarters of the department in which they are used.

The American Railway Association will place a qualified official of the passenger department in the office either of the governor, or of the adjutant general, as may be deemed most suitable by the state authorities in each state. This official will keep in touch with the state authorities in any emergency which may arise and will assist them in carrying out the schedule. The schedules which are used for the first movement will also be used for the second and third movements with such modifications, to be decided later, as may be essential.

Railroads have been instructed that it is necessary that railway passenger train equipment used for the movements of the National Guard or the National Army be immediately emptied upon arrival at the camps, and immediately returned to the road from which it was received. Orders for the disposition of the Pullman equipment released will be waiting for the cars at destination. Movements of empty passenger equipment, railroad or Pullman, according to the instructions, must be made with utmost expedition that it may be available for further service at the earliest possible moment.

The movements of National Guard troops up to date have been principally of advance contingents sent to training camps for work in preparing them for the larger number of men to follow. They have been moved in day coaches where the journey did not involve more than a day and a night of travel and in tourist and standard sleeping cars where the journey was longer. Where sleeping cars are used three men are assigned to a section.

1,200 RAILROAD WAR GARDENS

Nearly 1,200 "war gardens" are being cultivated this summer on vacant land of the Pennsylvania Railroad and its Lines East of Pittsburgh by employees for the use of themselves and their families. The value of the crops raised will probably exceed \$250,000.

Altogether more than 1,000 acres have been planted, and are now producing crops of potatoes, peas, beans, tomatoes, corn, and various other garden vegetables. The average size of each plot of railroad land, tilled by an employee, falls just short of an acre.

Special arrangements were made this spring by the Pennsylvania Railroad to induce employees to take up unoccupied land belonging to the company, and plant it for the purpose of assisting in increasing the nation's food supply. Through the real estate department of the company, a plan was worked out whereby any employee could, without formality, obtain the use of as much land as he could properly cultivate, and upon a mere nominal rental. All that was necessary for an employee to do if he desired to raise a "war garden" was to apply to his superior officer and sign

a simple form of lease. The land would then be placed at his disposal.

To encourage proper and scientific methods of cultivation, every employee undertaking to plant such a tract was supplied with a copy of "The Garden Primer," issued by the National Emergency Food Commission, and also a copy of a booklet on Potato Culture, which was prepared by the Agricultural Department of the State of Pennsylvania especially for the use of the Pennsylvania Railroad.

Since March 1, 613 new leases have been made covering garden tracts cultivated by employees of the Pennsylvania Railroad. In addition, 569 other tracts of the railroad's land are being cultivated on leases dating from previous years.

Besides the land used for kitchen-garden purposes, under nominal rentals, the Pennsylvania Railroad has leased to employees and others 649 larger tracts of land, owned by the company but not at present utilized for railroad purposes.

These tracts are being cultivated as farms, or are used for cattle grazing and similar purposes. Of these tracts, 231 consist of improved farms, and 89 of unimproved farms. There are also 315 large tracts used for pasturage, and 14 tracts for miscellaneous agricultural purposes.

NEW YORK CENTRAL AGENT COUNTS ON 10 TO 15 BUSHELS OF BEANS

The illustration shows an employee's garden on the New York Central. The agent at Chaumont, near Watertown, N. Y., took a lease on a plot opposite his station, 1,500 ft.



A New York Central War Garden

long and 25 ft. wide. He reported to the manager of the road's farm bureau recently that this was the first time the land had ever been turned up by the plow and "heretofore was an ideal spot for all varieties of weeds." He planted one-quarter of his plot to white marrow beans and recently counted more than 32 full grown pods each on a number of the hills. He expects from 10 to 15 bushels of dry beans. He also reported that the further end of the garden was planted to Irish cobbler potatoes and that when he opened one hill 10 days ago he found one tuber "as large as your fist." Needless to say the garden is attracting more than passing attention from the summer tourists.

REPORT OF ENGLISH RAILWAY UNION.—The annual report of the National Union of Railwaymen of England shows that the number of branches has increased during the year from 1,240 to 1,270, and that the membership, inclusive of those at present absent from the country, has risen from 307,305 to 340,511.

What Is a "Fair Return" for Public Utilities?

To Be Well Served We Must Let Investors Earn as Much
as Men of Average Success Earn in Other Business

By William G. Raymond, C.E., LL.D.

Dean of the College of Applied Science, State University of Iowa.

SOME of you may wonder that an engineer, a man accustomed to deal with things rather than with ideals, to talk about tangibles rather than intangibles, to have visions of structures of wood, steel, stone, and mortar, rather than visions of social conditions; whose thought runs not in warm, musical, rhythmic measures, but rather finds expression in cold, hard statements of fact; some of you may wonder, I say, that such an one should be invited to address you, you a body of actual or potential teachers accustomed to deal with souls rather than things; to talk about intangibles rather than tangibles; to have visions of social conditions rather than visions of artificial structures; and whose training should tend to make the expression of your thought to flow in warm, measured periods rather than to burst explosively in cold, hard statements of dreary facts. And I wonder whether or not there is any significance in this, other than an indication of desperation on the part of the committee of arrangements, which has perchance found itself embarrassed in these times of business stress and activity. I wonder whether possibly it may be that we are coming nearer together in our thought and interest; whether possibly in this materialistic age, you of ideas and ideals, whose field of effort is the development of souls, and I of the field of steel and stone, may find it not without interest and possible profit to turn aside a little, each from his own field, to consider something that belongs in the area of no man's land, or rather everyman's land, that lies between us. I hope we may find it of interest and profit to consider for a little time a question that has puzzled lawyers and engineers, courts and commissions, and even those very positive people, economists and sociologists, namely: What is a fair return?

FROM THREE STANDPOINTS

All too briefly for adequate consideration we shall try to discuss this question from three standpoints:

1. The fair return in private business.
2. The fair return for privately owned and conducted public service.
3. The fair return for benefits received.

I should like to consider it from a fourth and perhaps the most important standpoint of all, namely, fair return for personal service. But this question asked and argued through volumes already written, yet never answered, I could not hope even to formulate fully in two or three whole addresses, to say nothing of trying to discuss the question in the fourth part of one very brief address.

Doubtless those of you who have done your major work in economics or sociology will recognize early in the discussion that I am groping in a field already well explored by experts; but I believe it is a fair statement, to make, that no person or body of authority has ever answered the question, "What is a fair return," with finality. With respect to pub-

lic utility corporations, those organizations that furnish us with water, light, heat, power, and transportation, the courts have said that the owner of a public utility property is entitled to a fair return on the fair value of his property used in the public service, but no generally accepted rule or method for determining fair value has been established, nor has an upper or lower limit of fair return been determined.

Everyone of us has contributed to the earnings of private businesses and public utility corporations. We have purchased various supplies from various tradesmen; we have paid railway and street car fares, bought electric power, gas and water, and we have somewhat arbitrarily and without much thought believed that we were paying too much, that the shop keepers and corporations were waxing fat at our expense. But how many of us have ever stopped to consider why men are in business and what they must earn to be called successful and be praised for their thrift, energy and foresight; and how many of us have considered with any care at all what we owe as fair return to those who have made it possible for us to prepare ourselves for service of a high order?

THE RIGHT TO EARN A PROFIT

Considering first a private commercial enterprise it is perhaps trite to say that the right to earn a profit over and above expenses is conceded to all men engaged in such enterprises. To the private business man the public concedes the right to include a salary for himself in his operating expense and when he does this he gets a living out of the expense of his business, and his profit may be saved and accumulated from year to year until he has secured a competence, or a large fortune. He is rated as a successful man if he accumulates a competence, as a particularly successful man if he accumulates a large fortune, and so long as his acts are considered honorable he is praised for his intelligence and business ability and his advice may be sought on public matters. There is no limit set to his rate of profit or the magnitude of his operations. Except rarely in times of greatest stress, as a time of war, the law will not attempt to regulate his earnings, for that would be interfering with his inalienable rights, and to reduce his earnings would be taking his property without just compensation, which results in a violation of the constitution of this country. How large are the profits earned?

One business man is contented with a small rate of profit if it is enough to give him a modest living, while another is ambitious and seeks a larger rate and makes a larger effort in order to secure those luxuries and that position that a large income makes possible.

THE RATE OF PROFIT

The profit rate of return is frequently spoken of in ordinary commercial business, not as a rate on the capital invested, but as a rate on the gross business done. A corner grocer in the suburbs charges a large profit rate on very small



Dean William G. Raymond

*An address delivered at the Mid-Summer Convocation of the State University of Iowa, Iowa City, Ia., on July 27.

sales that he may earn a modest living, while a Marshall Field, a Wanamaker, or a Woolworth collects a smaller profit rate on very large sales that he may earn for himself or his company a moderate rate of return on the invested capital, which moderate rate will yield a large annual income.

If on a capital of \$1,000 a small dealer does a business aggregating \$10,000 gross, he hopes to make say 10 per cent on the \$10,000, or 100 per cent on the capital actually invested, but this is not profit, it is only salary which some people count as profit. As the extent of his operations increases and he does a business of \$100,000 a year, he may hope for a net return of at least 5 per cent on his gross business over and above salary. As his business grows he invests more capital which he takes from his profits or borrows from the bank, and he does a business amounting to \$1,000,000. On this he hopes to earn from $2\frac{1}{2}$ to 3 per cent, or perhaps 10 to 20 per cent on his actually invested capital. When his business amounts to \$10,000,000 a year, he is content with perhaps 2 per cent profit, or even less, on the gross volume of the business, since this will yield from 10 to 20 per cent on his actually invested capital and this has gotten to be so large that a smaller rate of return enables him to live in the manner he chooses, and the business is established and safe.

He could probably incorporate the business and sell the stock on a 5 or 6 per cent return basis, pocket the resulting profit, invest it in safe securities yielding 4 or 5 per cent, and spend the remainder of his days in such activities as might please him. This is the successful man—the more than average successful man. It is a lamentable fact that the average man in business is a failure so far as his business results are concerned. He may not go into bankruptcy but he takes \$20 a week or \$100 a month out of the business as salary, thinks he is earning a profit but really makes no profit at all, not even interest on his actually invested capital. Such a result cannot be called success.

BANKING AS AN EXAMPLE

Men who invest their money in a new banking business, one of the more stable and certain kinds of business, expect that their money will earn not less than 10 per cent and they hope for and usually receive considerably more than 10 per cent, which is partly paid in dividends and partly by payments to the surplus fund which increases the market value of their stock. When the business is well established and is earning on the average 10 per cent on the par value of its stock, men will be willing to invest in this stock at such prices as to make their return less than 10 per cent and often as little as 5 per cent on the investment. One of the great banks of New York pays regular dividends of 25 per cent quarterly, or a return better than 100 per cent annually, and occasional extra dividends of 100 per cent, and its stock is quoted at more than 40 times its par value. This bank has established an enormous business with a relatively small capital. It charges for its service no more than its service is worth else it could not do the business in competition with other banks. There are numerous other banks whose stock is worth several times its par value because of the large returns on the originally invested capital, and the existence of a large surplus, which returns and surplus have been realized by doing a relatively large business on a small capital.

MANUFACTURING AND CONTRACTING

When one goes into any manufacturing business or into a contracting business involving considerable risks, he figures to receive a large return rate because of the risk of actual loss or very small or irregular return, which frequently results. He plans to make from 50 to 100 per cent if all conditions prove favorable and to make 10 per cent if conditions prove to be as unfavorable as he thinks at all possible. Not

infrequently conditions prove more unfavorable than he thought possible or he makes some mistake or oversight in his estimates and as a result he loses money; on the other hand occasionally conditions prove to be much more favorable than he had hoped for and he makes a large profit. The thinking public permits and expects such profits, and must pay them or it does not get its work done.

NO DEFINITE FAIR RATE

These considerations seem to indicate that in private business there is no rate of return that can be called in general a fair rate of return. Any business man or corporation seems to be permitted by common public consent to earn any rate of return on the actually invested capital that is possible by honorable dealing. In general business then there is no standard for determining a fair rate of return. The laborer is worthy of his hire and whether he makes his talents return an hundredfold or only tenfold, he has earned no more than a fair return if he has dealt honestly and has not defrauded or oppressed his neighbor. Indeed, a fair return in general business might be defined as any return a business is able to earn fairly through the use of honorable methods.

AS TO PUBLIC UTILITIES

Does the same definition hold for public utility properties? In considering this question it must be remembered that men go into the business of furnishing public service—service that is generally recognized to be a proper, if desirable, public function—for exactly the same reason that men go into any other business, namely: to make money. Perhaps this is not the most laudable ambition and it may be that it is not to be compared favorably with the ambition of the scholar in pure science, whose ambition is to discover something new and valuable to the world; but it is an ambition regarded as worthy by most men, possibly because it is the principal ambition of most men. And it seems fair to say that the business man, who has reached the point where he is satisfied with simple interest on his money has passed the period of greatest usefulness to his community and to the world unless he devotes his life to gratuitous public service; he has lost his ambition to create wealth; (I believe the successful distributor of wealth is almost certain to be also a creator of wealth) he has lost a human quality most essential to the material progress of the world. Let it be granted at once that material progress is not more important than spiritual progress if indeed it is as important, but, also, let it be recognized that material progress is essential whichever sort of progress may be deemed the more desirable.

If then we prefer to have men of ambition and courage undertake to serve us in certain ways rather than to serve ourselves, to provide our water supplies, our light, heat, and power, and our transportation facilities, must we not expect to permit them to earn at least as much as men of average success earn in other business of equal risk and magnitude? Of equal risk and magnitude is a simple and well sounding phrase, but close acquaintance will develop difficulties of determination. On the other hand if we give these men of ambition and courage the practically exclusive privilege of supplying us with certain necessities of life, may we not say to them: "You must deal fairly with us. You must charge us no more than the service is worth to us, and this must be determined by its cost to you, because its cost to you may be considered to be what it would cost us to serve ourselves. To this cost to you we shall expect to add a good profit to pay you for relieving us of the burden of serving ourselves, but we shall look to you to see that this profit is not more than successful men in private business of equal risk and investment expect to earn. Come, let us agree as to what this shall be and how we shall treat and share from time to time in the

beneficial results of advance in the art of furnishing the service you propose to furnish."

NECESSITIES AND LUXURIES

It may be that the fair return will depend on the nature of the business. The furnishing of an absolute necessity, like water, by a monopoly company should call for a less rate of return than the furnishing of a luxury like gas or electricity for two reasons:

1. A sociological reason—because absolute necessities should be supplied always at the lowest possible cost.

2. A business or economic reason—because there is less risk in developing a property to supply an absolute necessity, for which there is no practicable substitute, than in developing a property to supply gas or electricity, either of which is always in partial competition with the other and both in partial competition with oil.

To be sure as time goes on gas and electricity tend to become necessities, but there is always much more to be done to develop this condition than to develop the necessity for a pure water supply. The possibility in the development of demand for gas and electricity is much more unlimited than is that of developing a demand for water. Though the demand for water may be limited, yet water will always be needed; it will never go out of style or be superseded by something better. Gas properties have already suffered by the introduction of electricity, and the art of electric lighting and power development and transmission is advancing so rapidly that new machinery and appliances of today must be discarded tomorrow. Functional depreciation allowances must be large or great risk must be recognized as a reason for allowing a high rate of return.

CAPITAL AND INTEREST RATE

Again different businesses require differing ratios of capital to annual volume of business done. The successful private mercantile business has as a rule gross annual receipts far in excess of its invested capital, so that 2 per cent of the gross annual receipts may mean from 6 to 20 per cent of the invested capital, while in a railroad business one finds exactly the opposite condition. In this business the invested capital is always larger than the gross annual receipts, so that, as an average for the United States, perhaps it is fair to say that a profit of 20 per cent of the gross annual receipts will mean not more than 5 per cent and perhaps less on the honestly and reasonably invested capital. Thus a relatively large rate of return measured as a percentage of business done must be allowed such enterprises in order to make the return measured as a percentage of invested capital compare favorably with the returns in purely private enterprises.

The legal rate of interest in a given state or country may influence the conclusion as to fair rate of return. If the legal rate has been determined by the people to be 6 per cent and not more may be charged without involving the charge of usury, then it would seem to be clear that 6 per cent is not enough to warrant a company investing its money in a business which requires effort and the taking of certain risks from both of which the money lender is free, if he lends on good security.

IS 6 PER CENT ENOUGH?

The foregoing matters influence private business as well as privately owned public utilities; the two are unlike only in the greater degree of control exercised by government over public utilities, and the fact that these are as a rule more nearly monopolistic in character than private business, which though not always so, is more often entirely competitive. Because of the monopolistic feature of public utility service, a feature in some cases less existent than is often supposed, we are apt to feel that such enterprises should be subject to many more restrictions than private business, and that they should be limited to a very moderate rate of return on

their invested capital, some persons believing 6 per cent to be sufficient. The considerations thus far developed ought to indicate that no uniform rate of return can be fixed that will be fair to all utilities; that we cannot expect business men to go into public business with an expectation of earning less than they could earn with any success in other enterprises of like risk and magnitude, because they go into public business for the same reason that they go into private business—to make money—and until private business is limited by law there would seem to be no good reason to limit the earnings of privately owned public utilities to less than the return of the average successful private business of like risk and magnitude. No definite percentage can be fixed as measuring this return, but that it is more than the 5 or 6 per cent that some would fix as the limit, a glance at a purely hypothetical but entirely reasonable example will serve to show.

The banking business, while competitive and complex in its details is in general theory one of the simplest businesses to reason about, and being pretty well controlled by law furnishes a fairly good example from which to begin reasoning with respect to other business. It involves some risks but when well managed is perhaps reasonably free from most of the risks attending many other kinds of business. The banking company has capital invested, and generally the law makes it necessary that its capital shall be all actual; that if \$100,000 of capital stock is issued, \$100,000 of cash must be behind it actually paid into the treasury of the company. The banking company has operating expense consisting of rentals, stationery and printing, advertising, wages, and other incidentals, and interest paid to depositors. It performs service for its depositors, stores their money, furnishes them with books, checking blanks, etc., and pays out their money on their order, keeping track of receipts and payments. For the use of the depositor's money, the company pays this service and from nothing to perhaps, 4 per cent interest. The rate depends on the character of the deposits, whether savings or open account, and on their magnitude, very large open accounts receiving, perhaps, 2 per cent on the average daily balances, small accounts nothing.

The banking company lends its depositor's money to others and charges from 5 to 8 per cent or more depending on the size of the loan, the nature of the security furnished, the law fixing the maximum rate, the demand for money, and competition, although there is little variation in the rate due to competition. It also has a small amount of incidental charges for commissions, protests, etc. As a result of its charges and expenditures the company may clear from 1 to 2 per cent on the loans; that is to say, if the average interest charges are, say 6 per cent; then from $\frac{1}{10}$ to $\frac{1}{3}$ of its charges or gross business will be profit. If a banking company with \$100,000 capital has loans amounting to \$1,000,000, which is a not uncommon ratio, and its average interest charge is 6 per cent yielding \$60,000, and if $1\frac{1}{2}$ per cent on the loans, or a quarter of the charge is profit, the banking company earns net \$15,000, or 15 per cent on its invested capital.

This is not at all an unusual or peculiar result of the operation of a moderate banking business in a moderate sized community. It will be noted that as in the case of railroad property, the income is less than the capital. If the loans are two million dollars with the same ratio of expense and profit, the net earnings will be 50 per cent on the capital, while if the loans are only half, or \$500,000, the net earnings will be but $7\frac{1}{2}$ per cent on the capital. Of these two latter conditions the first is rare and represents unusually profitable business, and the second, though not to be called rare, represents somewhat less than an average success in banking. In the first case the income is more than the capital.

If the foregoing is fairly representative of the conserva-

tive business of banking—a business hedged by regulatory statutes—and such results are recognized as fair and reasonable, does it not appear that we should hesitate to limit any public utility to a 5 or 6 per cent return on the capital reasonably invested?

REASONABLE ATTITUDE

Now without question when business properties, any of them, purely private or privately owned public utilities, are firmly established and earning, say, 15 per cent on the outstanding capital, there will be those who will be glad to buy the securities on a 5 per cent basis, and the market price of the stock may be 300, or three times its par value. The stock may then be increased—watered as it is sometimes called—to three times the original amount, and the increase distributed gratis to the stockholders of record. Other things may be done that are less defensible. It has been not uncommon for public utility corporations to keep their evidences of capital, bonds and stocks, at such an amount that the return should appear to be not more than from 5 to 8 per cent, largely because of the fear that the public noting larger returns would take action to reduce the earnings.

This would be made unnecessary by a reasonable attitude of the public toward its service corporations; a realization that those engaged in public utility work are not public agents entitled to a wage only and guaranteed that wage, but that they are business men engaging in a business for the same reason that other men engage in other business, *with no guarantee against failure*, and that subject to certain limitations of fair dealing when supplying common necessities, they are entitled to make their talents earn other talents just as other business men, praised for their foresight, judgment, and ability, make their talents earn other talents.

Must not the conclusion of the matter be that the "fair return" on the "fair value" of a public utility property, that the courts have talked about so much and have judged to be the right of every public utility corporation to earn, means any return the corporation can earn by honorable methods when operating freely without rate regulation, so long as it does not exceed on the reasonable investment, the rate of return expected by the man or corporation of average success in other business of equal risk and magnitude; and may not the rate exceed this average successful rate if thereby incentive is given to develop economies in which the public may share?

PLEA FOR AN OPEN MIND

My plea is not for the corporation but for an open mind when considering great questions of public policy; for a spirit of fairness when considering private or corporate acts as they affect us; for freedom from hasty judgment without adequate evidence. You all have read of the plea of the railroads to the Interstate Commerce Commission to be allowed an advance in rates in this time of high prices and increased expense due to governmental action fixing the length of the working day. Many of the larger private businesses, some, to be sure, whose prosperity is closely linked with railroad prosperity, have seen the justice and need of an increase in transportation rates, but the farmers of the country have appeared by counsel before the Commission to try to prevent the increase in the rates. The farmers of the country are heavy shippers and feel the effects of changes in rates, but it is worth while to call attention to a fact brought out in a recent editorial in the *Railway Age Gazette*, that whereas farm products have increased in value tremendously in the past six years, railway rates have stood almost still. In 1910 the freight rate on wheat from Chicago to New York was 11 per cent of the farm value of the wheat; last year it was only 6.3 per cent of the farm value of the wheat. In 1910 the freight rate on corn from Chicago to New York was 18.6 per cent of the farm value of the corn; last year it was but 10½ per cent of that value. To increase

the rate by the amount asked by the railroads would advance the freight charge on grain but a very small amount measured as a percentage of the value of the grain, and would leave it still much less than it was a few years ago.

I am not arguing the case of the railroad. I do not say whether the increase demanded is necessary; there are other factors to be considered; but I call attention to this curious fact to emphasize my plea for an open mind in considering questions of public and private concern, and for fair dealing between men. The need must be evident from this example of the farmer and the railroads. It may be that in the years to come government will over-turn all the theories of supply and demand, of competition and combination, now held by economists, and will fix the reward for all public and private effort. I do not look for this time in the near future, and until it shall come, who shall say with justice that this man may make his talent earn ten talents, but this other man shall make his talent earn but one talent? Let us be fair.

HEAVIER CAR LOADING AND THE RAILWAY BUSINESS ASSOCIATION

Winning the war by making every freight car do all it can has now enlisted in cooperation with the Railway Business Association trade organizations having a total membership of 20,000. These are national, state and local bodies which have recommended to their members the performance record blanks through which the president of each company can measure from month to month the progress maintained by his shipping department. A vigorous effort is afoot to extend the number of the associations participating in this movement in order that the heavy traffic of coming months will find thousands more shippers conserving car supply by system.

George T. Smith, of Jersey City, chairman of the Association's Freight Car Thrift Committee, has made public the names of 40 bodies which have already responded. He issues a new appeal to the others. All the secretary of such an organization has to do is to multigraph a letter, ask the Railway Business Association for the requisite sets of blanks and drop in the mail.

Following are the organizations which have recommended performance record blanks to their members:

- American Face Brick Association.
- American Feed Manufacturers' Association.
- American Hardware Manufacturers' Association.
- American Iron, Steel & Heavy Hardware Association.
- Associated Industries of Massachusetts.
- California Redwood Association.
- Carriage Builders' National Association.
- Hardwood Manufacturers' Association.
- Hard Yarn Spinners' Association.
- Illinois Manufacturers' Association.
- Knit Goods Manufacturers of America.
- Manufacturing Chemists Association.
- Michigan Manufacturers' Association.
- National Association of Automobile Accessory Jobbers.
- National Association of Furniture Manufacturers.
- National Association of Garment Manufacturers.
- National Association of Glee and Gelatine Manufacturers.
- National Association of Stationers and Manufacturers.
- National Association of Stove Manufacturers.
- National Confectioners' Association.
- National Lumber Manufacturers' Association.
- National Machine Tool Builders' Association.
- National Paper Trade Association.
- National Petroleum Association.
- National Pipe and Supplies Association.
- National Varnish Manufacturers' Association.
- National Wholesale Grocers' Association.
- Ohio Manufacturers' Association.
- Richmond, Va., Chamber of Commerce.
- Rochester, N. Y., Chamber of Commerce.
- Rubber Association of America.
- St. Joseph, Mo., Commerce Club.
- Silk Association of America.
- Sioux City, Ia., Commercial Club.
- Southern Hardwood Traffic Association.
- Southern Pine Association.
- Southern Supply and Machinery Dealers' Association.
- Syracuse, N. Y., Chamber of Commerce.
- Toy Manufacturers of the U. S. A.
- United States Sugar Manufacturers' Association.

Possibilities of a Market-Train Service*

Primarily Designed to Aid Small Producers and City Consumers and to Operate Over Short Distances

By G. C. White and T. F. Powell

Transportation Specialists, Office of Markets and Rural Organization.

IF the statement be true that more than one-half of the industrial and commercial energy of the civilized world is expended in the provision and preparation of food, it becomes all the more important, as the density of population and the economic conditions of the United States approximate those of the Old World, that the producing areas in the vicinity of large consuming centers be utilized to their full capacity, and that the products of such areas be accorded an efficient and economical transportation service.

Conditions controlling the commerce of England have developed a railway freight service characterized by light trains of high speed and frequent movement, cars of small capacity and very low minimum weights. The settlement of the greater part of the United States and its industrial development followed the advent of the railroad. The long distances separating the sources of raw material from the mills and factories utilizing it, as well as the character of the raw material, have developed high minimum weights for large cars of great weight capacity drawn in heavy trains by powerful locomotives. The development of these features of the freight service of the railroads of this country has received relatively more attention than has been given to the improvement of facilities for short-distance local traffic.

The greater part of the trading at the principal live-stock markets of the United States is done on certain designated days each week, and special trains carrying nothing but live stock reach these markets in large numbers on those days. From a comparatively small area in the Imperial Valley of California approximately 5,000 cars of melons are shipped to market each year, the bulk of the crop being handled during four weeks in June. During the height of the shipping season special trains carrying nothing but melons move east across the desert. From certain of the Gulf ports special trains carrying only bananas run on frequent and fast schedules to northern cities. Solid trains of milk daily supply New York City with that commodity. All these may be termed "special market trains," and, for the most part, they are additional examples of the efficient handling of long-distance, high-speed traffic of large volume.

In that section of the United States lying north of the Ohio and Potomac rivers and east of the Mississippi, known in railroad parlance as official classification territory, has taken place the greatest industrial development of the country. Here is situated much agricultural land in small units, the individual farm yielding dairy products, poultry, small live stock, and fruits and vegetables, which mature at different seasons, and produce less than a carload quantity of any commodity at one time; here are our most populous cities, daily demanding a supply of perishable foodstuffs; and here density of population and economic conditions are beginning to approximate those of the Old World. In this section are presented many opportunities for developing the possibilities of a market-train service along the lines of the service now furnished by milk trains.

Steam and electricity in passenger transportation have relieved some of the congestion of the population of large cities, but the suburban development of residential districts has withdrawn a proportionately much larger area from tillage, until most of the market gardeners have been pushed back beyond wagon range of the city markets, and many of

them beyond the range of the autotruck. Coincident with this development has come the increasing demand for greater quantities of foodstuffs, and it becomes necessary, therefore, that the commutation passenger service of the large cities find its counterpart in a similar freight service. The relatively small number of postal cars as compared with freight cars, or even with express cars, makes improbable any considerable amount of relief by the parcel post at the present time, and express service has not fully met the need.

The limited market-train service maintained by certain of the roads serving New York City, and the somewhat more extensive service of the same kind maintained by roads serving Philadelphia, were foreshadowed in some of the marketing practices which developed with the construction of the first railroads in the United States. Following the analogy of turnpike operation, the first railroad companies furnished roadway only; horses were the only motive power; farmers furnished their own motive power, paid the necessary tolls for the use of the track, and hauled their produce to market in their own vehicles.

More than 50 years later, in 1888, the reports of the Interstate Commerce Commission disclose a special market-train service by four of the railroads leading to New York City, and doubtless there were other roads that offered a similar service. The service consisted in transporting on the daily milk trains, in the same cars with the milk, such commodities as fresh meat, berries, butter, and eggs, and in returning to the shippers the empty containers, such as meat baskets, berry and egg crates, and butter carriers.

The rapid increase in the milk business and other conditions peculiar to its transportation and marketing in the course of time made it necessary to restrict the milk cars almost exclusively to the transportation of milk. However, many, if not most, of the tariffs covering the transportation of milk to Boston and New York include pot cheese as a commodity which may be included in mixed carload lots of milk, cream, and buttermilk. A railroad in Vermont and another in Massachusetts permit the transportation of butter in milk cars, and a road in Maine includes eggs. One road serving sections of Pennsylvania and New York and participating in the New York City milk traffic handles in its milk cars practically every class of farm produce except fresh meat. Another road serving an extensive section of New York makes tariff provision for a similar service by its milk trains. One of the trunk lines serving New York City has had in operation since 1890 a produce train giving a carload service for farm products on one of its divisions; and on another division the same class of commodities is given a less-than-carload pick-up service by milk trains.

The examples given of special facilities and service, in the transportation of less-than-carload quantities of farm products, are merely some of the best-known examples and, of course, do not include all the cases throughout the country to which attention might be called. The most conspicuous examples are the market trains running to Philadelphia over the rails of two of the carriers serving that city.

The first road runs its market trains over the several divisions only once a week. The trains leave the most distant stations, some 60 miles from Philadelphia, about 7.30 a. m. and reach Philadelphia about 2 p. m. Some of the cars used are box cars fitted with adjustable ventilators in the

*Abstract of a bulletin issued by the Department of Agriculture.

doors and in the side walls. Some of the cars are equipped with hooks along the walls for hanging fresh meat, a fact which makes it easier to keep the meat both clean and cool. Some of them are combination stock-and-poultry cars, one end being slatted for small live stock and the other end of the solid, box type for the reception of coops of poultry. Refrigeration by means of ice bunkers built into the cars is unnecessary because of the short time of transit. Some of the cars are assigned to the more important stations and are lettered with the name of the station to which they are assigned.

The rates named are any-quantity rates, and range from 10.5 cents to 28.4 cents per 100 lb. They apply on "marketing," which is defined as including dairy products (except milk or cream); poultry-yard products; products of the orchard, garden, or farm; fresh or dried fruits or vegetables; and such small live stock as calves, sheep, lambs, pigs, and hogs. The charges must be prepaid or guaranteed; and the rates apply only on shipments handled on designated market trains.

The railroad disclaims responsibility for loss or damage resulting from neglect on the part of marketmen to comply with its instructions, which read as follows:

All marketing must be properly packed for safe transportation and protection against loss, theft, or damage to contents of packages, plainly marked with consignee's name, and promptly and properly claimed upon arrival of market train at destination.

The suggestion is made that, for obvious reasons, shipments should be accompanied by the owners, but the freight rate does not include the transportation of the owners; they have to pay passenger fare.

The facilities are excellent for handling and taking care of the shipments on the arrival of the market trains at Philadelphia. The terminal station for the market trains is centrally located, directly adjacent to a wholesale market, and is itself equipped with a cold-storage plant. Immediately on the arrival of the trains the shipments are unloaded. They can be transferred directly from the cars to the station cold-storage rooms, or to stores of dealers in the wholesale market. If it is desirable or necessary to take them to other parts of the city, it is possible to unload them directly from the cars into wagons backed up to the cars. Apparently the one thing lacking to make the facilities complete is a retail market or a row of farmers' stands along the sidewalk in front of the station. Under the plan of this railroad, the freight is handled and delivered in the same way as general merchandise.

The second road inaugurated its market-train service more than 25 years ago. The trains are run daily, except Sundays and holidays, and the speed is that of the average passenger train. The farthest point served is not more than 75 miles distant from Philadelphia; consequently there is no need for car-lot refrigeration, although some shippers at times do ice their own packages.

The rates charged the shippers are slightly higher than the first-class freight rate, ranging from 15.8 cents to 31.5 cents per 100 lb. and applying on "marketing" "carried on market or milk trains, when accompanied by shipper holding trip or excursion ticket." The tariff naming the rates is an intrastate tariff, and does not give a list of the articles or commodities included in the general term "marketing." The charges must be prepaid, and the rates include the return of empty containers.

The principal retail market of Philadelphia occupies the street-level floor of the passenger terminal of this company, but this is not the terminal for its market trains. Freight arriving by market trains is delivered at freight stations at other points. On the whole, the facilities at these stations are not so good as those of the other road whose service has been described. Shippers or their representatives must be on hand, on the arrival of the trains, to claim and unload the consignments, as the carrier does not perform this service.

The transportation is at owners' risk, the carrier disclaiming responsibility for count or condition of the packages on delivery.

RESULTS AND ADVANTAGES

It must be borne in mind that a market-train service, such as is discussed here, designed primarily for small producers and city consumers, is of equal advantage to the carriers, and is in fact an economic necessity. It is of no interest to growers whose production is sufficiently large to enable them to ship in carload lots; nor would it be of any advantage to those communities where co-operative associations have united to combine into carload shipments the output of many small farms devoted to the production of the same commodity. When the distance to market is so great as to make protection of perishable commodities by refrigeration necessary, shipping in carload lots is essential for that reason alone. Aside from the question of refrigeration, and regardless of distance, producers should combine their shipments into carload lots, whenever it is possible, for economy in transportation charges. But, for farmers living along a single operating division of some railroad, within a hundred miles of a large city, or along a branch line terminating at some large city, who can produce a variety of foodstuffs almost continuously the year round, a market-train service would be of the greatest advantage.

The fruits and vegetables on such farms mature at intervals throughout the summer; the dairy products, eggs, and poultry, to say nothing of such commodities as apples and potatoes, can be shipped throughout the year as they are ready for shipment or as the market demands. There is not enough of any one commodity on a single day along the entire division or branch line to make a carload, even if it were otherwise feasible to combine it into a carload; and there is not enough of all commodities at one station on a single day to combine into a carload, even if the great variety of products and containers did not make it impossible to load the usual minimum weight into a single car. Such are the products of farms of this kind, and the success or failure of the farmers is in proportion to their ability or inability to market their products at a profit.

Other things being equal, the market nearest to him is the best market for the small farmer who produces a great variety of commodities and does not specialize on one or two. As has been shown, distant producers can reach any market with car-lot shipments, while the small producer here described, unable to ship in carload lots, is confined to the near-by market. His nearness to the market enables him to keep in closer touch with market demands, and he can quickly adjust his supply to the demand. To a distant shipper, large quantities in transit may bring loss by reaching destination on a falling market. In comparison with the large producer, the small farmer is doing a retail business. With a retail market adjacent to or in the city terminal of the market train, he would be in a still better position to do a retail business in every sense of the word and to sell directly to consumers.

This is just what was done during a part of the summer of 1912 in the case of a market train run to East Pittsburgh, Pa., by one of the roads serving that point. The farmers shipping by the train were organized in a farmers' exchange association, and the association had a representative at East Pittsburgh, who disposed of the shipments. Some of them were sold to wholesale and retail dealers, but the greater part was sold to factory employees. While the usual facilities of a retail market were wholly lacking, the service quickly developed a retail market, as sales were made in the railroad yard directly from the car to the householder. So popular had the service become and so great a reputation had it attained at the time it was discontinued, that a more affluent class of people was beginning to take advantage of it, some

of them coming long distances by automobile to do their daily marketing there.

Apparently all classes of people who bought supplies of foodstuffs here found some advantages over previous methods. It is quite evident that those who came long distances to buy got either a better quality of goods or lower prices, if not both.

This particular service was given for only 46 days during the months of April and May, when it was discontinued. The reason given for its discontinuance was that the terminal facilities were not satisfactory to the health authorities from a sanitary standpoint. The season of the year and the short period during which the train was run did not give sufficient opportunity to make a correct estimate of its probable continued success. Apparently there was no lack of patronage.

FACTORS NECESSARY TO SUCCESS

Market-train service is not a panacea for all the ills that afflict the small farmer in the marketing of his products. Every item of labor performed by the farmer in serving the consuming public is from one point of view an element of his co-operation with others. From the standpoint of his returns for the service that he performs he alone is responsible for the efficient performance of many of the items of labor. Sometimes he fails to recognize fully his own responsibility in co-operative effort, and sometimes he is mistaken in the causes to which he attributes the failure to market his products at a profit. Again he alleges cheaper methods of production on the part of his competitor or a disadvantage against himself in the matter of freight rates.

Mention has been made of co-operative associations whose efforts are directed toward consolidating into carload shipments the output of many small farms producing the same commodity. A market-train service with adequate terminal facilities in the way of a retail market offers an ideal opportunity to the producing community served of forming a co-operative association for the sale of its products directly to city consumers. No better opportunity can be asked for restoring the custom of direct exchange between producer and consumer, as far as it is possible to restore it, in those sections where changing economic conditions coincidentally have brought about the abandonment of that custom and have developed the necessity for a market-train service. With a representative of the association at the terminal to dispose of products directly to householders, all questions of variation of price on account of quality and condition are determined at the time of the sale by an actual joint inspection of the commodities by the seller and purchaser; no vexatious correspondence is afterwards necessary in adjusting claims—correspondence which may terminate established business relations by arousing mutual suspicion of lack of good faith; and, what is by no means the least important advantage, it is a cash transaction and the purchaser avoids the annoyance of remittance by letter.

As a step-toward the successful marketing of his products, the farmer must be brought to a realization of the justice of many of the criticisms against some of his methods. He must produce the commodities that the consumer wants; and only their superior quality will command prices higher than are being paid for the same commodities shipped from remote sections. If his products are not graded as carefully nor packed in containers as attractive as those of the long-distance stuff, he will not get the prices that are paid for the long-distance stuff.

One of the roads furnishing a market-train service to Philadelphia states that if the service were not already established it is hardly likely that it would be established "in view of the very light yield of revenue therefrom." As the inauguration of the service in the beginning was the result of judgment based on careful estimates, no figures of actual

operation being in existence, the statement would seem to indicate a desire to withdraw the service. The road that served East Pittsburgh in 1912 rendered a similar service at two other cities, Butler and Allegheny, Pa., from 1907 to the close of 1914, when the service was discontinued. The service to East Pittsburgh was inaugurated under the jurisdiction of the passenger department, as it was intended at first to handle the shipments on passenger trains. Later it became necessary to transfer it to the freight-traffic department. This road handles a large volume of heavy traffic to and from the iron and steel mills in the Pittsburgh district. Eighty-eight per cent of its entire tonnage for the fiscal year 1915 consisted of products of mines, while its total tonnage of agricultural products and products of animals was less than four-tenths of 1 per cent of its entire tonnage. Under the circumstances it readily can be seen that a market-train service would be of little interest to its freight-traffic officials from the standpoint of either tonnage or revenue.

It is true that some producers have begun to utilize the parcel post to some extent and that the reduction in interstate express rates which became effective in the early part of 1914 has attracted some shipments by express. In some sections freight service by interurban electric lines has afforded a slight measure of relief, but the advantages of that kind of service are too frequently offset by the lack of adequate and centrally located city terminals and the restrictions imposed on the running of freight cars through city streets. In some cases the growth of intermediate towns has attracted a considerable portion of the commodities that formerly went to the large city terminal. City boards of health have imposed restrictions making it necessary to exclude other commodities from milk cars, which increases the cost of performing the transportation service on lines where one car would hold all the shipments. This competition is pointed out by roads now giving a market-train service; and roads that do not now give such a service offer these and other facts as objections to its inauguration.

The small farmer is dependent on either local freight-train service, which is too slow, or on express service, which relatively is too expensive. The slowness of local freight-train service was pointed out in the Report of the Mayor's Market Commission of New York City, submitted in December, 1913, where it was said that it took from ten days to two weeks to get freight from some places distant for passengers only two hours from New York. The same conditions that now prevail with reference to the transportation of small quantities of miscellaneous foodstuffs formerly prevailed with reference to the transportation of milk to the large cities. The problem was solved in the case of milk, and it would seem that it can be solved as readily in the case of the other commodities. To cut off a city's supply of milk produces a crisis quickly; attention is called sharply to the situation, and a remedy is devised promptly. Lack of marketing facilities for the small farmer affects the producer more vitally than the city consumer, but the bad effects, while they make themselves felt more slowly, are none the less sure and none the less harmful to the community at large.

A market-train service affords an excellent method of restoring, as far as it can be restored, where it has been abandoned, the custom of direct dealing between producer and consumer. It contemplates the shipper loading his products into the car at point of shipment and taking possession of them immediately on arrival of the train at destination. There should be a retail market, or at least a wholesale market, in or adjacent to the city terminal. The service is more valuable to the shipper than ordinary local freight-train service. The time in transit is practically that of trains carrying express matter, but collection and delivery is made by the shipper. Such a service, to be successful, depends on the organized effort of the producing community intelligently directed in sympathetic co-operation with the carrier.

Increased Utility of Modern Malleable Iron

Facts versus Current Fallacies Regarding the Manufacture and the Physical Characteristics of the Metal

By A. H. Weston

Sales Engineer, T. H. Symington Company

THERE are a number of fallacies, both in connection with the manufacture of malleable iron castings and with the physical characteristics of the metal itself, which are unfortunately still entertained as facts by many engineers. These fallacies, based largely on hearsay, and to some extent on experience with the product of manufacturers who have



Fig. 1—Malleable Iron Wedge Tested Under a Light Drop Hammer

not kept in touch with developments in this industry in the past few years, may be cited as follows:

(1) That the strength and ductility of malleable iron castings lie principally in the skin.

(2) That malleable iron castings with thickness of sections exceeding $\frac{1}{2}$ in. cannot be completely annealed.

(3) That malleable iron castings are frequently over annealed.

(4) That the ultimate tensile strength of malleable iron does not average much over 40,000 lb. per sq. in., and the average elongation does not exceed 6 per cent in 2 in.

(5) That malleable iron is frequently unreliable due to non-uniformity in methods of manufacture.

The outer skin of a malleable casting does not by any means supply the major part of its strength and ductility, as the core has both of these qualities. In fact, there is very little, if any, difference between the strength of the metal in the core and that in the skin.

A malleable iron wedge is shown in Fig. 1 which has been subjected to the wedge test adopted as one of the standard test practices of the Associated Manufacturers of Malleable Iron. For this test the wedges are cast 1 in. wide by 6 in. long and are $\frac{1}{2}$ in. thick at the base, tapering to $\frac{1}{16}$ in. at the top. They are held upright under a small drop hammer shown in Fig. 2, and are repeatedly struck by this hammer until fracture commences. Each blow delivers 70 ft.-lb. of energy. The number of blows required to start fracture and the shortness of the uncurled portion of the wedge are taken as one means of measuring the strength and ductility of the iron.

The record of the following test conclusively proves the ductility of the core of a malleable casting. Several of the wedges as above described were cast of the standard width and length, but were made five-eighths inch thick at the base and three-sixteenths inch thick at the top. These wedges then had one-sixteenth inch machine off the 1 in. by 6 in. faces, leaving a wedge of the same dimensions as the un-machined standard wedge. Since the skin of a malleable casting is only about one thirty-second inch thick, the removal of one-sixteenth inch insured the removal of the skin. After machining, these wedges were put under the drop-hammer and subjected to the standard test. Their appearance after test was as shown in Fig. 3.

These results compared with tests made at the same time of un-machined wedges from the same furnace and annealed in the same oven are tabulated below:

	Unmachined wedges, blows.	Machined wedges, blows.
Afternoon heat, June 3.....	18.5	13.20
Afternoon heat, June 4.....	29.75	26.30
Afternoon heat, June 6.....	19.75	21.20
Average	22.67	20.27

It will be noted that the average result of the three tests of un-machined wedges is but slightly above that of the three



Fig. 2—Wedge Method of Testing the Ductility of Malleable Iron

tests of machined wedges, and in one case a machined wedge actually stood more blows than an un-machined wedge. Assuming this one case to be unusual and considering only the other comparative results, it is evident that malleable iron, even with its skin removed, is both ductile and dependable.

All parts of a malleable iron casting, even if the sections are as thick as 2 in., can be completely, thoroughly and uniformly annealed. The micrographs shown in Fig. 4 are illustrative of this fact. These micrographs show the typical

structure of first class malleable iron after anneal, the white areas being ferrite (pure iron) and the dark spots temper carbon. The structures shown range from the extreme edge to the exact center of a 2-in. section. It will be noted that the structure is practically the same in every case.

Heavy malleable iron castings are readily annealed, and insofar as this last step in the production of malleable iron is concerned, the process with heavy section castings is not different from that used with castings of light section. All that is required to anneal malleable iron castings is to raise them to a temperature at which the cementite and pearlite in the hard iron break down into ferrite (carbonless iron) and carbon, to give the action time to be completed and to cool slowly. It is obvious that a heavy section casting can be heated to the annealing temperature as readily as one of light section; for no matter how heavy a mass may be it can be heated throughout to any desired temperature if surrounded by a medium at that temperature for a sufficient time. The annealing of malleable iron requires about seven days, more than enough time for a heavy section to reach the temperature of its surroundings.

The annealing process, however, is not the one which alone controls the successful production of heavy malleable iron castings. An equally important factor is the foundryman's close adherence to the somewhat different procedure required in the production in the "hard iron" of castings of heavy section from that required for castings of light section. Regardless of thickness of section the prerequisite in making good malleable iron is to have practically all the carbon in the "hard" or "white iron" castings in the "combined" state. If carbon to any extent occurs there in the uncombined state the iron will be bad. Several factors tend to cause this condition; notably excessive carbon or silicon in the molten metal at time of pouring, and rate of cooling.

The rate of cooling has a very sensible influence on the appearance of "uncombined" carbon in the "white iron" castings; the slower the iron cools in the mold the greater the tendency for graphite to separate out. Obviously a casting 2 in. thick will cool much slower than one of $\frac{3}{8}$ -in. section. Consequently, in the manufacture of heavy-section castings the carbon or silicon, or both, in the molten metal must be lower than when light-section castings are made. This is taken care of by the operation of different furnaces



Fig. 3—Machined Malleable Iron Wedges Tested Under the Drop Hammer to Show the Ductility of the Core Metal

with different charges, suitable for very light work, medium weight work, or for very heavy castings.

Malleable iron castings cannot be over-annealed. It has been determined by very exhaustive tests that no marked deterioration in quality results if a casting is exposed to the proper annealing temperature for even four or five times the normal length of time of the anneal. This fact is evident from the appearance of the fractures shown in Fig. 5, which illustrate malleable iron that had been annealed from one to eight times. The strength and ductility of the iron showed no noticeable change until after the fifth anneal, and even then the deterioration was very slight. The illustrations of the fractures, made from ordinary photographs of the

polished and etched sections indicate that after the second anneal a ring of pearlite appears, working steadily towards the center during each successive anneal. The structure on each side of this ring is still the free ferrite and carbon characteristic of superior malleable iron.

It is true that malleable iron castings can be burned, as can all iron and steel products if heated to too high a temperature, but in all malleable iron foundries deserving of the term "modern" the annealing ovens are equipped with an electric pyrometer with terminals at various points in the ovens. In this way the temperature throughout the ovens is accurately known at all times.

Malleable iron with a tensile strength of 38,000 lb. per sq. in. and an elongation of 5 per cent in 2 in. was considered satisfactory under the old methods. At the present time good malleable iron has an average tensile strength somewhat above 45,000 lb. per sq. in. and an average elongation of 8 per cent in 2 in., seldom falling below these values and frequently rising above them. That this statement is conservative and as indicative of what quality of malleable iron can be produced and is quite often produced

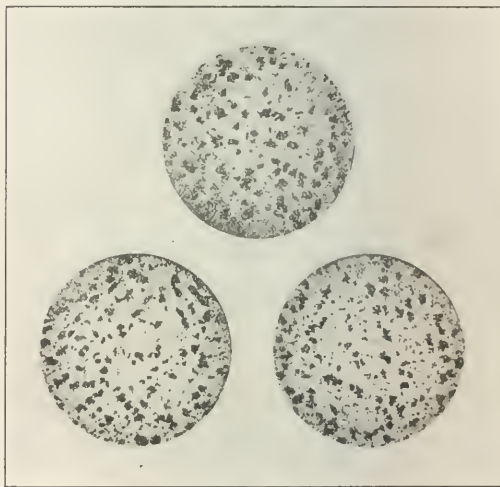


Fig. 4—Photo-Micrographs Showing the Structure, from the Edge to the Center, of a Malleable Iron Casting of Two-Inch Section

today, the following data, taken from a record book of one of the association's foundries, show 16 consecutive heats from one furnace:

Heat	Tensile strength, lb. per sq. in.	Per cent elongation in 2 in.
November 1, A. M.	53,800	10.91
November 1, P. M.	57,300	10.51
November 2, A. M.	56,100	11.71
November 2, P. M.	54,400	12.50
November 3, A. M.	55,800	12.50
November 3, P. M.	54,100	11.71
November 4, A. M.	54,100	11.73
November 4, P. M.	53,800	10.95
November 5, A. M.	56,100	14.09
November 5, P. M.	60,000	14.05
November 6, A. M.	52,100	7.89
November 6, P. M.	54,100	10.90
November 8, A. M.	55,400	9.37
November 8, P. M.	55,100	10.89
November 9, A. M.	57,700	9.42
November 9, P. M.	55,400	14.09
Average	55,300	11.45

The Associated Manufacturers of Malleable Iron have recently voluntarily adopted a specification for railroad malleable iron castings, applying to the product of some 30 member companies, embodying a minimum tensile strength of 45,000 lb. per sq. in. and a minimum elongation of 7½

per cent in 2 in. This specification they will offer to all purchasers of such castings and agree that their product shall be accepted or rejected on this basis.

Assertions are still frequently made that malleable iron is unreliable due to non-uniformity in methods of manufacture and other defects inherent in this metal. This was doubtless true of the product as a whole made some years ago, and may still be true of iron made by those manufacturers who have not kept abreast with recent developments, but it does not apply to malleable iron produced by the Associated Manufacturers of Malleable Iron. This association, comprising a large number of malleable iron manufacturers in this country, has had in its employ for some time metallurgical experts who have by patient research insured the production of an iron which is ductile, strong and uniform in quality. The three means of investigation made use of by these experts, and in continued use, are the chemical laboratory, the physical laboratory and photo microscopy. Standards of procedure adopted by and compulsory with members of this association may be briefly described as follows:

After the castings are poured an analysis is made to disclose any irregularity in furnace operation and to give assurance that the desired composition of the iron is obtained. At the same time necessary test bars are cast from each heat to be used to determine the tensile strength, transverse strength and ductility. These test bars are distributed at different points in the oven in which the castings from this

quality of malleable iron, are preventive of considerable economy in car and truck construction due to the unnecessary use in many cases of cast steel car members instead of the less expensive malleable iron parts.

With respect to the stated inferiority of malleable iron to cast iron "under loads subjecting it to pure compression," this reiteration of a well known fact is superfluous, as the comparison made applies with equal force to all ductile steel products, and further, with the exception of wheels the inability of cast iron to resist shocks should eliminate its use on freight cars.

It will be noted from the above quoted statement, that "malleable iron is greatly inferior to cast steel in strength and ductility," and further, "It should not be used subject to high tension or bending strains unless breakage will not involve danger or damage to other parts of the car." Comparing malleable iron as produced today with cast steel, the actual facts as proved by tests at once controvert this opinion and recommendation.

In testing a cast steel rod having an ultimate strength of 65,000 lb. per sq. in., the elastic limit was reached at 32,200 lb. per sq. in. A malleable iron bar, having an ultimate strength of 53,500 lb. per sq. in. under tensile test, showed an elastic limit of 38,500 lb. Thus the elastic limit of the malleable iron bar was 9.38 per cent higher than that of the cast steel bar. It would seem hardly necessary to emphasize the advantage of this particular characteristic of malleable iron when it is recalled that the elastic limit and

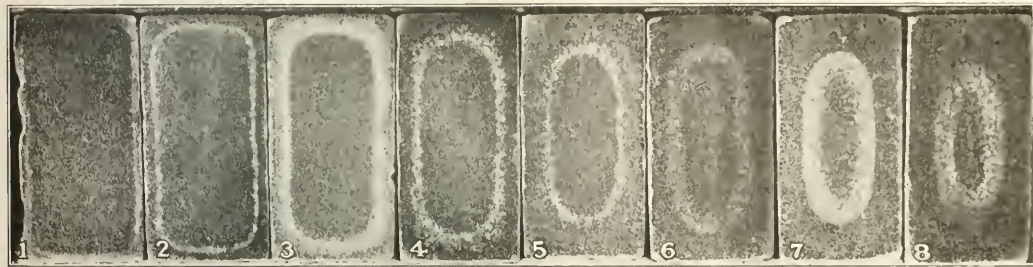


Fig. 5—Photographs of Polished and Etched Fractures Showing the Effect of Successive Annealings on Malleable Iron

heat are annealed. After the castings, test bars and wedges have been annealed the bars and wedges are tested. Each one must come up to a certain standard before the castings are considered fit for service. If any bar fails to meet this standard, sections are cut from the casting, examined under the microscope, and the cause of the failure thus ascertained.

The following statement appears on page 13 of the 1914 report of the M. C. B. Committee on Car Construction:

"Malleable iron varies greatly in quality and is generally inferior to cast iron under loads subjecting it to pure compression. It is ductile, and has ability to resist shocks without cracking, which makes it superior to cast iron for car details not subjected to high tension or bending strains. It is greatly inferior to cast steel in strength and ductility. It should not be used subject to high tension or bending strains, unless a breakage will not involve danger or damage to other parts of the car."

This statement, while without question made in good faith at the time of this report, if now reviewed by the same committee members would doubtless be considerably modified, but it unfortunately stands on record as part of the last published report of an M. C. B. Committee on Car Construction. The assertions made, with one exception, do not now apply, are misleading, and where seriously entertained by those not in touch with the great improvement in

not the ultimate strength is used by engineers as the proper basis in designing castings. Despite the high ratio of elastic limit to ultimate strength, the unquestionable ductility of malleable iron is proved by the wedge tests as above described and illustrated, and by the figures given for percentage of elongation.

The not infrequent failure of steel castings due to interior flaws which cannot be detected by surface inspection is a matter of common knowledge. Examination of steel castings which have failed in service will in almost every instance disclose flaws in the core of the casting which were not in any way apparent on the exterior surfaces.

Malleable iron shrinks and cracks less than cast steel, and very rarely contains blow holes. This is because malleable iron castings are poured at a lower temperature than steel castings. The higher the temperature to which a metal is heated the more gas it takes up, with resultant greater liability to blow holes. Likewise the higher the temperature of the molten metal the more rapid its rate of cooling in the mold, with resultant tendency to shrinkage, flaws and cracks.

Much of the adverse opinion concerning malleable iron is due to the misconception as to its adaptability to heavy as well as light-section castings and lack of co-operation between designer and manufacturer. An engineer, with the erroneous belief that it will not do to design a malleable iron

casting with sections in excess of $\frac{1}{2}$ in. in thickness, has his attention called to such castings in service failing in considerable number, and forthwith decides on the substitution of a steel casting of such increased thickness as to weigh 60 to 100 per cent more than the malleable iron casting which it replaces. Had only a part of this additional metal been put into a properly redesigned malleable iron casting, equal or better results would have been obtained with less dead weight and less expense. Again, an engineer without precise knowledge of the peculiarities of malleable iron designs a car casting in such a way as to cause hidden shrink cracks and internal strains sufficient to result in a large percentage of failure in service. Experience has demonstrated that by intelligent co-operation with the foundryman developments of this character are entirely avoidable. The malleable iron manufacturer knows his metal. With this knowledge he is well informed how best to design any given pattern so that unequal shrinkage in the component parts of the casting made from it will not occur; thus affording maximum strength for a given weight. While he may not be fully informed as to just what is required in service of a certain part, he knows that failure because of structural defects, at once apparent to the experienced malleable iron foundryman, can be avoided by making the casting a little thicker here, a little thinner there, bracketing at one place and altering at another.

Freight equipment draft gear and attachments are admittedly subjected to greater abuse in service than any other car members. Modern friction draft gears and many of the draft attachment parts have always been and are still made of malleable iron, and yet it is a matter of record that the percentage of failure of these malleable iron parts of friction draft gears and draft attachments is not greater than that of the steel couplers. As a matter of fact, malleable iron draft castings can be and are designed so as to make them proof against failure in the severest kind of service.

The writer submits that malleable iron as produced today by reputable manufacturers is on the whole just as dependable as cast steel, comparing the two metals in castings of the same thickness of sections and of length not over six feet. The truth of this statement, in view of the lower cost of the malleable iron casting, should merit the careful investigation of those engaged in the design and maintenance of freight cars.

GERMAN RAILWAY RESTRICTIONS.—References have recently appeared in our columns and those of the daily press relating to the growth of transport difficulties on the German railways. The latest official document on the subject available enumerates a series of drastic restrictions. To begin with, it is laid down that cars must be loaded and unloaded with all possible speed, and that work must proceed by day and night, including Sundays and all public holidays. The military authorities are given powers regarding the employment of soldiers and civilians when the railway staff is inadequate, and the necessity for quick unloading is especially urged on the owners of private sidings. Consignees are not to ask for cars unless they can be loaded in the time officially specified, and it is further provided that "no merchandise should be despatched unless the possibility of unloading is assured beforehand." Consignees handling large quantities of merchandise are required to give the railway authorities advance information of expected deliveries, and in order to avoid unnecessarily long journeys buyers of all commodities are requested to make their purchases at the nearest possible centre to the place of destination. Another regulation provides that "every despatch which is not indispensable should be avoided." These regulations followed on certain passenger traffic restrictions, which have since been added too.—*Railway Gazette, London.*

NEW HAVEN BUILDING LARGEST NEW ENGLAND FREIGHT YARD

The New York, New Haven and Hartford has started work on a new classification yard at Montwese, Conn., near New Haven, which, when completed, will be the largest and most complete in New England, and in comparison with the character and volume of business handled, it will rank with the great railroad yards of the country. The plans for the new yard have been drawn with the idea of increasing and improving the service of the New Haven and to provide the facilities for handling the peak load at all times without delay or congestion.

The new classification yard is to be located near New Haven because of the relative importance of that city to the whole New Haven system. It is similar to the hub of a wheel. Important lines radiate from New Haven to New York; to the west over the Poughkeepsie bridge route; to Waterbury and Winsted; via the canal line to Holyoke, Northampton and other points; to Hartford and Springfield; via the air line to Middletown, Willimantic and points in the northeast; and over the low grades of the shore line to New London, Providence and Boston, and other points in Rhode Island and eastern Massachusetts. The essential purpose of the classification yard will be to receive trains from all routes made up of cars for all destinations. In the yard the cars will be sorted out and made up into trains for their proper destination. All trains will leave the yard in station order for all the important destinations, many of them being straight made up trains for each of the more important commercial centres.

The yard will be of the hump type. There will be two distinct sections, one for eastbound and northbound traffic, and the other for south and westbound traffic. Each section will have three units. The first will be the receiving yard into which arriving trains pull in. The tracks in this yard will practically eliminate the standing of freight trains in the cuts and on the main line, both east and west of the New Haven station. It will also prevent delay to freight trains at other points in the vicinity of New Haven. The next unit is the classification yard. There will be about 25 tracks in the east and northbound unit and 15 in the west and southbound. They will be short tracks into which cars will be delivered by cutting them off at the hump and letting them drop into the various tracks by gravity. Each track in these two classification units will represent a single classification. The third unit is the departure yard. After being classified the cars are switched into this yard from the classification yard and are made up into trains.

A 16-stall roundhouse and a large merchandise transfer that will hold three or four hundred cars will be included in the layout. The plans for the new yard provide for the separation of grades at Air Line junction, where the westbound shore line passenger trains will be carried overhead all the tracks. The freight will pass underneath in the middle and the northbound passenger line will pass underneath and around the east side of the yard. Under this arrangement through passenger and through freight trains will not cross each other at any point at or in the vicinity of New Haven. In a similar manner, the freight tracks leaving the shore line east of the junction will be separated from the grade of the westbound passenger track.

The New Haven, in anticipation of this improvement, purchased nearly all the property required some time ago. At the present time five steam shovels are in operation and it is hoped to have a few of the tracks of the first unit completed within three months.

FRENCH LIGHT RAILWAYS.—France has a much greater mileage of light and secondary railways than is generally imagined, one company alone operating 1,366 miles.

Full Cars Are Essential for Train Loading

Five Discussions Which Point Out Some of the Basic Principles Underlying the Securing of Heavier Tonnage

THE first essential to a heavy train load is fully loaded cars. In the discussions of means of increasing the train load printed below several of the authors emphasize this and other primary factors which must be considered in a campaign of this kind.

SOME PRACTICAL ILLUSTRATIONS

By W. Wilson

Assistant Superintendent, Southern Pacific, Portland, Ore.

Train loading, engine efficiency and train miles are in the hands primarily of three men: the chief dispatcher, engineer and yardmaster. The average yardmaster is ambitious to keep his track clear and in doing so frequently overlooks the importance of a full train load. On a certain division the engine rating is 2,000 tons. Two trains are due to arrive a few hours apart. The first has 1,750 tons, the second 2,250 tons. In order to save a few minutes' work, the yardmaster runs the first train on arrival, 250 tons light, and the second train on arrival, reducing it 250 tons. If the first train had been made up and the 250 tons from the second train added, the delay would have been nominal and all tonnage would have been moved, securing 100 per cent engine efficiency with a full train load on both trains.

In figuring tonnage it often happens that to add one load to a train would make it ten tons over the engine rating. Instead of adding a 20 ton load, the yardmaster lets the train go out ten tons light. By doing this he has lost 20 tons, or one per cent on the train load and one-half of one per cent on engine efficiency or he has lost one train in 100 trains.

On a 700-mile division, of which the first 250 miles is on easy grades, two trains of fruit are moving; the first on time, the second three or four hours late. The first should be run with 90 per cent of the engine rating and be kept on time, and the second with 70 per cent of the engine rating to enable it to close up on the first at the end of the 250-mile run and be consolidated with it, filled to 90 per cent of the engine rating and so run for a distance of 250 miles, or over the various grades, furnishing the necessary helper engines that are adapted to such grades. This class of helper engines should be located at the different helper stations to handle the tonnage in the train, and at the same time correspond with the engine rating. With proper train despatching this train will have gained 30 min. to 1 hr., putting it that much ahead of time, leaving, say 200 miles of easy grade to be run, over which full tonnage and 100 per cent engine efficiency could be maintained.

On some divisions local freight trains make the division in six to eight hours, handling only a few cars. They should be filled to tonnage that will enable them to make the division in eight or ten hours.

In a large commercial center, several roads are competing for early morning delivery of merchandise at intermediate points. The time is very fast, making it necessary to handle a light train load. As a rule it is not essential to deliver Saturday's loading until Monday morning and Sunday's loading is very light, if any. On Saturday and Sunday these trains should be filled to full tonnage. A train including ten cars of bananas arriving at Chicago at 6 p. m., Saturday, for Monday morning delivery, would be time thrown away. Some of this time should be consumed on

the last 300 or 400 miles of the run for handling tonnage.

Chief dispatchers have been known to run several sections of fast freight trains a few minutes apart over long divisions, and in the prevailing direction of traffic, some of the sections gaining several hours and being delivered to the connection several hours ahead of time. By proper supervision on the part of the chief dispatcher, this time should have been used to haul full tonnage or to consolidate some of the sections, which would ultimately result in the saving of several trains.

Most engine ratings are made by the mechanical department, and the result is that our engines are underrated. While we make a good showing in engine efficiency we are losing in train load as against what our engine can actually handle.

It is not necessary to run test trains in order to arrive at what an engine can haul, or to figure engine ratings mathematically except to attain a fair rating. The proper way to test an engine to determine what it can haul is to add a load or two until you have gotten it where it will handle every pound possible of dead freight at a speed of 12 miles per hour over a freight district.

On a certain division the largest number of cars of perishable freight that had ever been handled in any one train was 50 cars. The connecting division delivered 60 cars of perishable freight on short notice. There was nothing to fill out with in order to run two trains. The chief dispatcher, knowing the engineer, instructed the yardmaster to let the 60 cars go in the one train, stating "Russell will handle them." He did and made the schedule, and from that time on, with the same class of engine, 60 cars of perishable freight has been the maximum. In fixing such schedules the chief dispatcher should take into consideration all conditions, including the number of trains to be met and passed, the weather, slow orders at the foot of short grades, whether the train consists of heavy or light loads, or mixed loads and empties.

LOADING TRAINS FOR THROUGH MOVEMENT

By H. S. Noble

Office of Division Superintendent, Pennsylvania Railroad, Erie, Pa.

On certain portions of a railroad there are usually a number of junction points where cars are interchanged, and also, on account of variable grades, numerous locomotive ratings have been established between local points. To operate such divisions by endeavoring to pick up and set off cars to suit the grades, will result almost invariably in a reduced train load. Theoretically it would appear that the maximum average train load is obtained by loading locomotives to their maximum rating between interchange points. In actual practice, however, a congestion will form at some outlying point where cars have been set off on account of encountering heavier grades, and it will become necessary to run an engine and crew light to the point of congestion to clear up the accumulation. The light locomotive mileage made in this operation increases the total mileage to the extent that the train load invariably falls off in proportion to the number of times the train master permits tonnage to accumulate at the outlying points. To overcome those difficulties through tonnage ratings with proper helping service on the grades will have the effect of increasing the average train load and incidentally reduce the coal consumption, overtime and draw-head failures.

On one division the writer found trains being operated

*Other papers received in the contest on Methods of Increasing the Train Load were published in the issues of June 22, page 1401; July 13, page 63, and August 3, page 201.

on the local tonnage basis, and owing to the heavy business and considerable overtime which was being made a heavier class of power of the superheater type was substituted in place of the smaller engines. Comparative records were kept to indicate the advantages of the heavier engines, during which time the old basis of setting off and picking up cars was practiced; this resulted in an increased train load of only 8.5 per cent. At the same time the overtime decreased 13.7 per cent and the coal consumption decreased 12.8 per cent. By the application of through tonnage ratings and the establishing of one regular pickup train each day, the train load was increased 21 per cent, the overtime decreased 68 per cent and the coal consumption reduced 27.4 per cent as compared with the corresponding period when the smaller power was used.

TEMPERATURE REDUCTION

On account of the fall in temperature during winter months, a reduction in the tonnage of freight trains must be made in order to produce a total resistance of the train equal to the power of the locomotive. No definite dynamometer car figures have been produced to show accurately the proper reduction to make in order to meet the various low temperatures. However, the following table indicates the percentage reductions that can be made for various grades, according to the amount of increased resistance due to fall in temperature.

TABLE SHOWING TEMPERATURE REDUCTIONS

Symbol	Pounds increment in resistance	Per Cent Reduction in Tonnage		
		0.3 Per Cent Grade	1 Per Cent Grade	1.5 Per Cent Grade
A	0	0	0	0
B	1	8.1	4.8	2.8
C	2	18.7	8.5	5.7
D	3	28.2	11.5	8.3
E	4	30.7	14.8	10.8
F	5	35.7	17.8	13.1
G	6	40.0	20.7	15.4
H	7	43.7	23.3	17.5
I	8	47.0	25.8	19.5
J	9	50.0	28.2	21.4

In applying the reductions on a division where at one terminal the grade is 0.3 per cent, and at the opposite terminal 1.5 per cent, it will be noticed that the reduction on the heavier grade is much less than that on the lighter grade. From observations noted on various railroads, the percentage reduction made for a given division is uniform and therefore no consideration is given to the smaller reductions necessary on heavy grades. In actual operation it has been found that where the temperature was about 15 deg. below zero, that 50 per cent reduction was found necessary on a 0.3 per cent grade, while on a 1.5 per cent grade only 25 per cent reduction was necessary for the same temperature. As the former ratings used on the division in question carried a flat reduction of 50 per cent for a temperature of 15 deg. below zero, it is evident that an increased trainload of 25 per cent is obtained through the use of the above table.

HOW THE ILLINOIS CENTRAL MADE PROGRESS

By O. O. Carr

Statistician, Office of General Superintendent of Transportation, Illinois Central, Chicago.

The revenue train load on the Illinois Central for 1916 was 550 tons, an increase of 182 tons over 1912, or 49 per cent in four years. About 6.4 per cent of this increase was accomplished by the greater tractive power of locomotives, about 1 per cent by grade reduction, and the balance by reducing the empty car mileage in the direction of the full train load, increasing the car load by heavier loading and increased car capacity, increasing the tonnage rating of locomotives by the equated method, rerouting fast freight trains to avoid three operating districts having unfavorable grade conditions, and by close supervision.

The supervision has been improved by a system of daily

tonnage reports compiled in the superintendent's office and distributed to the chief dispatcher, train masters, traveling engineers and others concerned, showing the per cent of the full engine rating handled by each train, the total for the trains run that day and the total for the month to date compared with previous periods. The data are taken from conductors' wheel reports. The work of compiling mileage and tonnage statistics from wheel reports has been transferred from the office of the car accountant to that of the superintendent in order to have the comparative train tonnage data available daily.

In addition to the daily check kept on each division, monthly graphic charts are distributed from the office of the general superintendent of transportation showing comparatively by months the gross and net train load in the direction of heavy traffic and in both directions, the car load, the percent of loaded cars to the total and the car miles in the direction of heavy traffic and in both directions.

The principal increase in train load was accomplished by adding tonnage to the trains handling the heavily loaded cars, as under the single rating for all lengths of trains, the short trains were underloaded.

KEEPING EVERLASTINGLY AT IT

By J. L. Coss

Dispatcher, Chicago, Rock Island & Pacific, Haileyville, Okla.

The problem of increasing the train load where the tonnage fluctuates rapidly and where many connections that interchange cars are located is a serious one. However, the fact that tonnage can be increased under these conditions has been demonstrated on the Indian Territory division of the Rock Island. There are 12 interchange stations on this division of 353 miles. These, in connection with local stock pick-up trains, long trains of empties in one direction and short trains of coal in the other, the bulk of the tonnage east-bound for a part of the month and westbound for the remainder, require a constant study of transportation matters to keep the train load normal, to say nothing of increasing it.

In the latter part of 1912 the average gross tons per freight train, which included three mixed runs on branch lines, was 1,025, while in August, 1916, it had reached 1,240, an increase of 215 tons per train, or 20.9 per cent. This was accomplished little by little during the intervening time with the same engines, with the exception of six which were converted into superheaters and delivered to this division at intervals of approximately 30 to 60 days. The superheater engines are capable of handling from 160 to 200 tons, or about 10 per cent more than the other engines.

From 12 to 18 engines, including the superheaters and small engines on the branches, are generally used on this division to handle the traffic. Local trains handle full tonnage in the direction of heavy traffic over the division.

Trains doubled over the line where the physical condition permitted and turn-around runs were handled in order to place tonnage for local trains that carry short cars for trains which were expected to pick up stock but which failed to load for various reasons and for trains that set out cars short of destination on account of their becoming bad order.

Agents have been cautioned repeatedly to see that cars are loaded to capacity and frequent checks are made with a view of correcting any errors in light loading. During the cotton loading season if an agent has 10 or 15 bales to load for the compress he loads them in a car and the car is then moved to some other station where a similar amount is loaded in the car, thereby avoiding light loading of cars in the direction of the compress. The mechanical department is pressed continually to keep the engines in good shape to handle the tonnage and the attention of the car department

frequently is called to the importance of seeing that boxes are well oiled and packed and brakes properly adjusted to prevent their sticking.

The roadmasters and bridge and section foremen are required to see that all bad track and bridges on which slow orders are placed temporarily are repaired as soon as possible and that no time is lost in reporting the repairs to the dispatchers' office in order that the restrictions can be taken off, thereby possibly preventing a train stalling and making the consequent reduction in the train load. The dispatchers take personal pride in seeing that the train is put on the side track that can get out of the siding most readily at meeting points and also to locate meeting and passing points with the least stopping of trains, all of which works to the advantage of the heavy trains. Agents are required to report to the chief dispatcher's office the moment loads are ready to move and when received from connecting lines in order that such cars can be figured on to fill trains that might have short or disabled cars.

The tonnage handled by conductors is frequently checked with the way bills at the end of trips to ascertain if they are handling the tonnage reported on their register slips and if the result reveals a light discrepancy the conductor is required to make an explanation.

When for any reason an engine fails to handle its rating, an immediate explanation is due from the engineer. The matter is not allowed to drag along until perhaps forgotten, but it must be investigated at once by the trainmaster and a representative of the mechanical department and a suitable explanation made.

In brief, the fundamental reason for this increase in train load is the diligent methods pursued day after day. The subject is not taken up one day and then allowed to lie dormant for a week or so, but it is pursued daily without any let up.

OTHER PRACTICAL SUGGESTIONS

Two Handicaps.—There are today entirely too many small classification yards in which a maximum train load cannot be approximated with a reasonable amount of switching. First of all, the territory to which heavy classification falls must be analyzed carefully. No classification yard is in a position to give a full train load unless it is sufficiently well junctioned, and its capacity great enough to accommodate the in-going and out-going movement of the maximum tonnage accruing to that territory.

During the days of active solicitation the railroads and shippers interested are inclined to establish specific train numbers or symbols, to protect the business of a certain district by exceptionally fast movement and prompt delivery. Many trains were operated in this way that were not necessary at the beginning or today. If a train was of a certain symbol it sometimes carried 25 cars or less, because there were no more ready at the scheduled time that contained the class commodity that this symbol or train was to carry, yet there were many cars for the same destination or classification that might have been despatched on the same schedule without delaying it, the only exception being that they carried another class commodity.—*A. E. Aumiller, Chief Clerk to Freight Agent, Pennsylvania Railroad, Harrisburg, Pa.*

Supervision.—Intelligent supervision and persistent action are necessary requisites in the successful prosecution of any scheme. The secret of increased train loading is nothing more nor less than the secret of concentration and intensified action. The responsibility for increasing the train load with existing facilities rests with the division superintendent and his subordinates. Enthusiasm, efficiency and activity should not begin with the dispatcher and go up to the superintendent, but should begin with the superintendent and permeate down through his organization. If the superintendent is not

personally efficient and active, he can not expect his subordinates to be. The superintendent should keep up enthusiasm by his constant activity; he should know from day to day the tonnage his trains are handling.—*H. E. McCier, Superintendent, Missouri, Kansas & Texas, Greenville, Tex.*

Avoid Car Delays.—In their zeal for increased tonnage, operating officers should not lose sight of the fact that the average car detention is increased. Holding a train for an hour or two in order to fill out may result in the failure to unload 50 more or less per diem days upon your neighbor, which is quite an item at the present time. In order to obtain maximum efficiency from the cars available, they should be given a maximum load promptly and then moved with despatch. An idle car should be viewed with alarm. The operating officer should keep before him the figures showing the average detention to foreign cars for each month and focus his energy on reducing them. It behooves all railroads at the present time to handle all cars with the least possible detention, to help alleviate the serious car shortage. Maximum tonnage is commendable as evidenced by the visible saving, but at the same time let us keep an eagle eye on the lookout for a possible invisible loss.—*H. S. Hanley, Superintendent of the New Orleans Great Northern, Bogalusa, La.*

Car Efficiency.—The present car shortage forces upon us the question of car efficiency. It has been said that if all cars used were fully loaded over a million cars could be released from service. This may exaggerate, but it is the firm belief of many that the present number of freight cars is sufficient provided they were kept busy, both as to movement and loading efficiency.

If fewer cars can be made to do the work, operating expenses will decrease. In moving grain from its lake port to the seaboard one railroad made an examination of the car axles on its 80,000 lb. capacity cars last year and found they would safely carry 94,000 lb. It loaded these cars with an average of 1,563 bushels, or 93,803 lb., and on a total movement of 17,769,391 bushels of wheat saved the use of 750 cars and a haulage of dead tare of over 9,000,000 ton miles. There was not a single accident due to the cars carrying the excess tonnage, although the total car miles plans for increasing railroad revenues. Whenever car earnings can be increased without increasing the rate per hundred was about 4,700,000.

Another way in which fewer cars may be made to do the same service is by increasing the minimum weights. To shippers this seems the least objectionable of the various pounds no one is injured and great economy is practiced. It is a fact today that minimum loads oftentimes do not fill one-half the cubical or weight capacities of a car. While it is true that the carriers in some instances might utilize the unused space in such cars for less carload freight, it is not ordinarily done, and there are many reasons why it is not a good thing to do. Roads with long hauls can doubtless use some of this space, but it is not a common practice.—*Geo. C. Conn, Freight Traffic Manager, Pere Marquette, Detroit, Mich.*

PIG IRON PRODUCTION IN 1917.—In the first half of 1917 the United States produced 19,258,235 tons of pig iron, comparing with 19,619,522 tons in the first half of 1916, and 19,815,275 tons in the second half of 1916.—*Bulletin of the American Iron and Steel Institute.*

CARS FOR PASSENGERS WITH BULKY PARCELS.—The 1916 report of the Metropolitan, the Paris underground railway, mentions that a number of second-class compartments without seats are now in use, for the special convenience of passengers with bulky parcels. The results of this experiment should be of interest in other large centers of population.

INCREASED LOADING OF FRUITS AND VEGE- TABLES

The Commission on Car Service has issued Car Utility Bulletin No. 2, addressed to shippers and receivers, pointing out ways in which the car loading of fruits and vegetables may be increased and showing that increased car loading will help eliminate the car shortage. The bulletin states that the ability of carriers to move the crops depends upon the co-operation of shippers in the full loading of cars and then gives plans illustrating how cars may be loaded to capacity with potatoes, cucumbers, tomatoes, onions, cabbages, beets, oranges, grape fruit, lemons, watermelons and apples, together with photographs showing how the contents of a car are frequently damaged when a car is not loaded full. One page of the bulletin gives suggestions for relieving freight congestion as follows:

"The demand for freight cars at the present time is far beyond that of any previous period in our history. When our troops are actually in the field this demand will be greatly increased. The following suggestions for relieving car shortage and freight congestions are recommended to the attention of shippers and receivers of merchandise:

- "1. Unload promptly all loaded cars received.
- "2. Load promptly all outgoing cars and release them immediately to the railroad.
- "3. Anticipate disposition of freight before its arrival.
- "4. Do not order specimen types of cars when ordinary types will serve.

"5. Eliminate use of railway equipment in trap or transfer service when tonnage can be handled by motor truck or wagon.

"6. Load all cars to their full carrying capacity, (110 per cent marked capacity) or cubical capacity, so that maximum use of each car will be obtained. This can be accomplished by:

- (a) more careful supervision of loading;
- (b) producers and buyers agreeing to disregard established trade units and increase the units as a war measure;
- (c) waiving rights in regard to minimum weights under tariff and traffic regulations;
- (d) buyers increasing their orders so as to fill the car, and producers disposing of their output on a basis of full carrying capacity of equipment furnished;
- (e) buyers who cannot handle larger quantities clubbing together with other buyers to make full capacity cars;
- (f) showing customers who desire, merely as a matter of convenience, smaller units than maximum how they can help the general situation by enduring inconvenience.

"(7) Load freight requiring refrigeration to the safe carrying capacity for the commodity loaded.

"(8) Load freight requiring ventilation to the safe carrying capacity for the commodity loaded, but understand that this class of freight can be loaded much heavier than freight requiring refrigeration, although not always to the full visible capacity.

"By more intensive loading, there will be a reduction in the number of cars under load, which will particularly relieve congested territory, where it is a question of track room rather than of equipment, so that business can and will be handled more promptly. Cars detained by congestion will thereby be relieved, and since congestion exists in the great consuming centers a reduction in the number of cars under load will result in better equalization of equipment throughout the country.

"In all cases keep the cars moving with a full load and settle differences of opinion afterwards.

"NOTE:—This Bulletin has the approval of the United

State Department of Agriculture, together with a number of leading railroads.

"Mr. Shipper, Mr. Wholesaler and Mr. Distributor, there is already an acute car shortage. This car shortage can be greatly reduced if you will make better use of car space.

"EFFICIENCY IS AS NECESSARY AS PATRIOTISM.

"WE ARE SURE OF YOUR PATRIOTISM.

"WE MUST HAVE YOUR EFFICIENCY."

USE AND ABUSE OF STATIONERY AND OFFICE SUPPLIES*

By M. K. Barnum

Assistant to Vice-president of Operation and Maintenance,
Baltimore & Ohio

The fact that the Baltimore & Ohio spent about \$410,000 for stationery and printing during 1916 shows the possibility of large savings in the ordering and use of stationery and small office supplies. The amount does not include typewriters, computing machines, tickets, passenger and freight tariffs, time-tables, etc.

As an illustration of the large cost of small items used in quantities, the stationer sent out 8,300 lb. of common pins, valued at \$5,677.65 during 1916.

Some of the other small articles which were furnished in large quantities, were the following:

611,159 pencils	498,264 pens
13,494 rubber stamps	11,500 sponges
18,537,620 envelopes	3,912,310 sheets of carbon
22,807,100 second sheets	10,104 pen holders
70,000 thumb tacks	2,615,600 file backs
421,000 blotters	3,924 message hooks
33,264 rubber erasers	10,620,730 rubber bands
2,487,000 McGill fasteners	900,720 clip fasteners

As an example of the lack of care used in some offices in making up stationery requisitions, one division superintendent's office recently ordered over 2,000 lead pencils for a 60 days' supply, although other offices on the division made separate requisitions for their own supply of pencils.

The following are among the bad practices in the use of stationery:

1. Cutting up printed blanks in current use for scribbling paper, instead of ordering pads.

2. Use of a large envelope where a small one will serve; also, not enclosing in one envelope as many communications as possible.

3. Discarding sponges instead of washing and re-using them.

4. Discarding carbon paper which is still serviceable.

5. Throwing rubber bands, pins, and fasteners into the waste basket which tends to reduce the value of the waste paper when sold, in addition to the loss of the bands, pins and fasteners.

6. Allowing the stationery to become scattered and soiled.

A few suggestions in the use of stationery are:

1. Carefully check supplies on hand before making requisition.

2. Have requisitions made up by some one with sufficient experience and responsibility to insure the correct amounts.

3. Return at intervals to the stationer at Baltimore, all surplus or obsolete forms on hand.

4. Save all waste paper and report accumulation.

5. Check over the records, correspondence, old catalogs, etc., and arrange for scrapping those which it is not necessary to keep.

It is estimated that from \$40,000 to \$50,000 a year can be saved by a general observance of the foregoing suggestions.

* Abstract of an article from the Baltimore & Ohio Employees' Magazine.

Judge Lovett Appointed Priority Director

Coal Given Preference for Northwest; Remarkable Operating Results in June; New Tariffs Filed in a Hurry

WASHINGTON, D. C., August 21, 1917.

ROBERT S. LOVETT, chairman of the executive committee of the Union Pacific and member of the War Industries Board of the Council of National Defense, in charge of priority, has been designated by the President as administrative officer under the provisions of the priority of shipments law, which authorizes the President, during the war, if he finds it necessary for the national defense and security, to direct that such traffic or such shipments of commodities as, in his judgment, may be essential to the national defense and security shall have preference or priority in transportation by any common carrier. Judge Lovett came to Washington shortly after the war was declared to offer his services and was appointed chairman of a committee of the Red Cross. Recently he was appointed a member of the new War Industries Board and given jurisdiction in particular over questions as to priority in manufacture. With his new appointment his function will be to determine the relative importance of various kinds of commodities to the work of winning the war, to the end that the articles and materials most essential shall be given precedence in both production and distribution over others less important to the national interest.

PRIORITY FOR COAL FOR NORTHWEST

The need for such an authority had been especially emphasized recently by the situation as to coal shipments across the lakes to the northwest and Judge Lovett's first official act after his appointment was the issuance of an order on Monday directed to 46 roads engaged in the transportation of bituminous coal to Lake Erie ports directing them until further order "daily to give preference and priority in the distribution of cars to coal mines served by them" and to transport the same so that bituminous coal for transshipment by vessel to ports on Lake Superior and Lake Michigan shall have preference and priority. The lake carriers were also ordered to accept and receive all cargoes of such coal tendered to them for shipment and to so load, transport and deliver them that it shall have preference and priority in transportation.

The order stated that "it has been made to appear, and the President through the undersigned finds, that under present conditions and volume of shipment, sufficient bituminous coal will not be transported via lake movement to Lake Superior and Lake Michigan ports before the close of navigation to supply the requirements of the territory contiguous thereto, which is necessarily dependent upon movement by lake for supply of bituminous coal, and that an adequate supply of bituminous coal in that territory is necessary to the

national defense and security, and that a condition exists requiring the exercise of the powers vested in the President" by the aforesaid act of Congress and conferred by the President upon Judge Lovett.

The fact that an adequate supply of coal has not been moving across the lakes, although it is said that ore boats loaded from the upper ports have in many cases returned empty, has been giving great concern for some time to the people of the northwest, the railroads, the Committee on Coal Production and the governmental authorities. Members of Congress from the northwestern states have been

agitating the question for some time both in Congress and at the White House and the Committee on Coal Production, the Commission on Car Service and the Interstate Commerce Commission have all given much attention to the situation. The consensus of opinion seems to be that the railroads have done everything in their power to move the coal but they have had no way of compelling shippers to use the cars furnished them to send the coal in the desired direction and many of the coal operators have preferred to ship elsewhere. It has also been said that the buyers in the northwest had delayed placing orders in the hope that coal prices would be further reduced.

At a meeting of representatives of the coal interests, the railroads and the Interstate Commerce Commission last week a resolution was adopted expressing the sense of the meeting that the situation could only be met by orders requiring coal operators

in the Pittsburgh, Fairmont and No. 8 Ohio districts to ship at least 50 per cent. of the cars furnished to their mines to the lake ports for transshipment. After this meeting further conferences were held with the Railroads' War Board and a committee composed of Daniel Willard, Howard Elliott, and G. L. Peck, F. S. Peabody, chairman to the Committee on Coal Production, and A. G. Gutheim, of the Division of Car Service of the Interstate Commerce Commission, was appointed to make a tentative draft of a priority order. The definite order was issued by Judge Lovett after a conference with the President on Monday.

STATEMENT BY HOWARD ELLIOTT

On Saturday the Railroads' War Board had issued a statement that in order to meet the exigencies of the situation in the northwest the roads had appealed to the national government to make use of the powers conferred by the priority law to force the movement of coal across the lakes before the closing of navigation. The entire situation was explained in



R. S. Lovett

a memorandum filed by Howard Elliott, which showed that the Railroads' War Board had been giving continuous attention to the subject since its organization, that on April 26 the roads were ordered to give preference to the movement of coal and iron ore and to confine the use of open top cars to this business so far as was reasonably practicable. As a result of this order, it was shown, the total number of cars of coal loaded and moved by the railroads in the United States has been as follows:

	1916	1917	Increase	Percent
May	692,316	876,591	184,275	26.6
June	899,378	1,146,334	246,956	27.5
July	658,200	862,026	203,826	30.9
Total	2,249,894	2,884,951	635,057	28.2

At 50 tons to the car, this represents 31,752,850 tons of coal loaded and handled in 1917 more than for the same period in 1916.

For reasons entirely beyond the control of the railroads, Mr. Elliott said, much of this very large increase in the movement of coal has sought markets other than those reached by Lake Erie ports and there had also been a reduction in the amount of coal loaded into boats at the ports because the season of navigation had been three weeks late this year, and in spite of the co-operative efforts of all there remained 17,110,000 tons of bituminous coal to be loaded and moved across the lakes in the 16 remaining weeks of lake navigation. Mr. Elliott said that as the fuel for domestic consumption in the northwest is largely supplied through Duluth and contiguous ports it was especially important to grant relief at once because it will be most difficult, if not impossible to obtain relief during the winter months by rail shipments because of the distance from the mines and weather conditions. He also pointed out that there are 18,000,000 tons of iron ore to be moved and that if coal is forwarded freely to Lake Erie ports empty cars are provided for iron ore going back, which will give a load in each direction and increase the total efficiency of the railroads, besides providing the necessary fuel and the iron ore needed for the furnaces up to June 1, 1918.

A somewhat similar shortage of coal shipments to New England has also been causing grave concern. A large part of the supply is customarily transported by water and the water shipments have been reduced because the government has commandeered so much of the boat capacity that would otherwise have been used for coal. A number of conferences have been held to discuss the situation but the northwestern situation has been dealt with first because it must be handled during the season of open lake navigation.

INCREASE IN COAL TRANSPORTED IN JULY

Reports received by the Railroads' War Board show that the railroads carried 129,721 more carloads of bituminous coal from the mines in July this year than during July, 1916. This increase, which amounts to 20.4 per cent, makes available for consumption 6,486,000 tons of coal in excess of the amount that would have been available had the railroads merely duplicated their July, 1916, performance. Through co-operative effort, however, and by giving preference to the movement of coal, the roads that handle the bituminous product loaded 764,965 cars last month as against 635,244 cars in July, 1916.

The railroads also achieved an increase in their average daily loading of bituminous coal in July this year over the average amount loaded in June this year, loading an average of 30,599 cars a day in July as compared with 30,059 cars in June. There was an increase in the average daily loading in all districts east of the Mississippi and an actual increase in the number of cars loaded in July this year compared with the month previous in the low volatile fields of Pennsylvania, Maryland, West Virginia and Eastern Kentucky and the high volatile coal fields of West Virginia.

The most notable increase in the total shipments in July this year as compared with July, 1916, occurred in Illinois,

Indiana and Western Kentucky. It amounted to 84 per cent.

The total increase in the amount of bituminous coal handled by the railroads for the months of April, May, June and July this year over the same months last year amounts to 578,536 cars or approximately 28,886,000 tons. This is 25.10 per cent more than the amount handled for these four months in 1916, and is indicative of the increased efficiency shown by the railroads since they voluntarily agreed to merge competitive activities and co-ordinate their operations in a single continental railway system in order to produce a maximum of national transportation efficiency during the period of the war.

INCREASED EFFICIENCY IN JUNE

Twenty-nine railroads, operating about half of the country's railway mileage and owning about half of the freight cars performed 25 per cent more freight service with only 3 per cent more cars in June, 1917, than in June, 1916, according to reports thus far submitted and compiled by the Commission on Car Service. This was accomplished not only through the co-operative efforts to bring about an increase in the loading of cars, thereby securing a greater utilization of their capacity, but also by a large increase in the trainloading and in the mileage per car per day, with a reduction in the empty car mileage. The comparison of the reports for June, 1917, with those for June, 1916, is as follows:

	June, 1917	June, 1916	Per Cent Increase
Mileage operated	125,488	125,338	0
Freight cars loaded	1,284,644	1,248,160	3
Revenue ton miles	19,676,463,348	15,650,194,737	25.7
Non-revenue ton miles	1,877,249,235	1,738,781,962	8.0
Total ton miles	21,553,712,583	17,388,976,699	24.0
Freight car miles	1,228,765,973	1,049,407,942	17.1
Tons per train	656	589	11.0
Tons per car	25.3	22.6	12.0
Average miles per car per day	31.8	28.0	13.6
Per cent empty car miles	30.8	30.2	0.6

EFFECT OF NEW LAW ON TARIFF FILING

Railroads apparently took advantage of the opportunity afforded them by the Interstate Commerce Commission's notice of August 10, that approval of a proposed advance rate must be secured from the commission before the tariff is forwarded for filing, but approving the filing of tariffs in transit or forwarded for filing prior to August 15, by rushing to Washington before midnight on August 14 as many tariffs as could be got together in the short time allowed, proposing advances in rates which were under consideration. Tariff clerks in the employ of the commission have estimated that the number of tariffs filed on August 14 and 15 suddenly jumped from an average of around 250 a day to nearly 3,000. Among those filed are a large number proposed by the eastern roads proposing advances in commodity rates which are based directly on class rates and which have usually fluctuated with them, for the purpose of bringing them up to the level of the increased class rates allowed by the commission in the fifteen per cent case. The commission has specifically ruled that such rates were not included in the meaning of its decision in that case but the roads had decided to make an effort to have them advanced correspondingly and therefore filed as many of the tariffs as possible to get them into the files before the taking effect of the new procedure caused by the amendment to the interstate commerce law requiring the approval of the commission before the filing of tariffs containing advanced rates until January 1, 1920. Among the articles on which advances are proposed in the new tariffs are livestock, dressed beef, iron and steel articles, and grain and grain products. Also many commodity rates are proposed to be advanced by the filing of supplements cancelling the commodity rates and referring to the class tariffs.

The filing of the new tariffs does not, of course, render

them immune from further proceedings in the way of protests or complaints leading to informal or formal proceedings, but avoids the formalities now made necessary before a tariff can even be filed. While no official notice has been made public it is understood that a tentative form of procedure has been adopted by which carriers wishing to file advanced rates will explain their purpose in advance to J. M. Jones, chief of the tariff division, and the members of the suspension board. In simple cases the filing will probably be allowed as a matter of course. In more important cases shippers would probably be notified and an informal hearing held similar to those now held where shippers ask the commission to suspend a tariff that has been filed but not yet become effective. In a case like the fifteen per cent case the commission might institute a formal ex parte proceeding as it did in the recent case.

TO REDUCE ACCOUNTING REQUIREMENTS

The Railroads' War Board has under consideration a plan for requesting the Interstate Commerce Commission to reduce during the war its requirements of the railways in the way of reports and statistics. The Committee on Corporate, Fiscal and General Accounts of the Association of American Railway Accounting Officers has been asked to study the question and consider a possible reduction in the accounting system now required by the commission.

WILL KEEP RECORDS OF PUBLIC'S CO-OPERATION

Admitting that public co-operation and helpfulness, inspired by patriotism, are chiefly responsible for the remarkable record of increased transportation service shown under pressure of heavy war demands, the eastern railroads will compile a record that will show just "when, where and how much" this friendly treatment has helped their efforts.

This unique contribution to war-time business literature—a "Chronicle of Co-operation" or "History of Helpfulness"—will be written in an effort to extend and perpetuate the new spirit which, the transportation chiefs aver, bids fair to be a most potent force in aiding them to fulfill their pledge to the government to "produce a maximum of national transportation efficiency" for the winning of the war. The record will be made up from day-to-day reports of specific acts of shippers, passengers, employees, public officials and others which definitely contribute to greater service, with an accurate accounting of the benefits of such helpful acts in mileage, cars, tonnage, fuel or dollars saved.

In an official request sent to railroad executives last Friday by L. F. Loree, president of the Delaware & Hudson and chairman of the Eastern Department of the Railroads' War Board, he said: "Co-operation of patrons and public, in many quarters where there has been indifference or hostility, it must be admitted is largely responsible for the splendid results thus far attained. A spirit of helpfulness on the part of persons dealing with the railroads, prompted by patriotism in face of actual war, has permitted economy and efficiency in operation previously not attainable. Fully to meet, on the part of the railroads, this friendly spirit, and to develop and extend such co-operation as a potent means toward gaining maximum service to win the war, it is deemed desirable that a record be kept showing just how the public attitude has helped."

A WAR LESSON OF LASTING BENEFIT

Chairman Loree in explaining the new move said: "Actual value of friendly co-operation by the public with the railroads—as measured by larger, better and more economical service—necessarily has been a matter of theory, subject to contradictory opinions, in the past. We now expect to be able to show by actual experience what a fair attitude toward

the railroads by the public means in the way of benefits to the public. This should furnish one of the many valuable lessons of the war, and it is our duty to make the most of it.

"The railroads have gone the limit to help the government in winning the war, surrendering their property and subordinating every personal advantage and profit to the nation's needs. The people have responded by greeting our efforts with appreciation and approval, in many quarters affording aid and co-operation that is invaluable and necessary to the best results.

"If we are able to extend and perpetuate this constructive, helpful spirit toward the railroads it will bring good results that are almost incalculable, and which will be permanent in their effect on American business, prosperity and progress.

"Railroad operators constantly are engaged in intensive studies for efficiency, economy and general improvement which the public hears nothing about. The theory that better public relations would yield improved service has been generally accepted, and we have sought earnestly to bring them about. In view of the accomplishments of the past hundred days, some have asked why the railroads have not reached such a height of service before this. Recent experiences have furnished the answer in striking fashion.

"The action of the Committee on Coal Production of the Council of National Defense in pooling their shipments alone has permitted the railroads to haul to Atlantic ports 6,640,000 tons more bituminous coal than they did last year, with an estimated saving of 153,000 freight cars. The coal producers have eliminated the great accumulation and the long delays of cars at the ports by patriotic action.

"Latest reports from about 60 per cent of the mileage of the country show that these lines rendered 16.1 per cent more freight service during May than last year, with practically the same number of cars and locomotives.

WAR REQUIREMENTS TO BE STILL GREATER

"The demands upon the carriers will be greater and greater as the war proceeds, and much remains to be accomplished in the way of improvement. The Nation's needs in transportation certainly will call for the utmost of patriotic co-operation from every citizen concerned, both in and out of the railroad service.

"Two items of co-operation, which lie with our public authorities should be afforded the railroads forthwith: First, the local, state and national government officials should not press for improvements and new construction that will not directly operate to increase the capacity of the lines for national service and contribute toward winning the war. With every man, machine and dollar available necessary to the war work, non-essential improvements such as new station buildings and grade-crossing changes should be deferred. Second, the so-called 'full-crew laws' still existing in some 20 states should be repealed or suspended for the war period, inasmuch as these statutes are compelling the railroads to transport an aggregate of over 20,000 trainmen in idleness, these able bodied and experienced employees being greatly needed to man additional freight trains and troop trains.

"Splendid progress is being made, and with a better public understanding of the benefits to be derived, still greater results may be hoped for."

MR. LOREE'S LETTER

Mr. Loree's letter to the presidents of all the railroads in the eastern department follows:

"The great increase in transportation service—particularly freight-carrying capacity—shown by the railroads since the special organization was formed to meet war demands, has occasioned considerable surprise and wonder, with some misunderstanding, on the part of the public. The question

has been asked, 'Why was not this greater efficiency attained before?'

"Co-operation of patrons and public, in many quarters where there has been indifference or hostility, it must be admitted is largely responsible for the splendid results thus far attained. A spirit of helpfulness on the part of persons dealing with the railroads, prompted by patriotism in face of actual war, has permitted economy and efficiency in operation previously not attainable.

"Fully to meet, on the part of the railroads, this friendly spirit, and to develop and extend such co-operation, as a potent means of gaining maximum service to win the war, it is deemed desirable that a record be kept showing just how the public attitude has helped.

"The savings effected in time, men, equipment and capital—with consequent increase in capacity of public service—by shippers' bettered practices, by more considerate and reasonable action of public officials, by care, energy and intelligence of employees, might be recorded, with credit bestowed where due, and the facts given to the public as the war work proceeds. The record should consist of definite, confirmed facts, with specific instances in point, and the benefits given in units of mileage, tonnage, cars, fuel or dollars added to capacity.

"The American public at home, and our citizens risking their lives abroad, alike will be interested to know what persons and forces have exerted every effort for national safety and for victory.

"Specific reports of gains and benefits might be noted in the following general branches: (1) Promptness in loading of freight cars; amount of former delay in idleness of equipment eliminated, and value thereof in number of cars added to service, and in use of warehouse, track and landing space. (2) Extent of loading cars to full capacity, or to desired 10 per cent in excess of marked capacity, with percentage of reduction of former 57 per cent of unfilled space in cars. (3) Reduction of premature ordering of cars, or ordering in excess of needs, through careless checking of cargo or unreadiness for loading. (4) Minimizing of damage and delay in transit and at destination by improved methods of packing cargoes. (5) Elimination of avoidable reconsignments, 'blind' shipping orders and kindred practices causing delays and extra handling. (6) Public authorities' and officials' actions toward reasonable and intelligent imposition of regulations and restrictions, tending to prevent unnecessary obstruction, inconvenience, loss and delay to the free flow of traffic. (7) Acts of employees of all ranks toward eliminating waste and lost motion; and also their conduct in meeting properly and supplementing the co-operative efforts of patrons. (8) Any and all specific instances wherein the action of a patron of your railroad has been the means by which greater service and efficiency has been attained.

"We deem it our duty to omit no effort to encourage and reward the 'win-the-war' spirit and believe that a general interchange of experiences and ideas on the subject, with full information given to the public, will be of lasting constructive benefit."

COAL DISTRIBUTION COMMITTEES IN ENGLAND.—The mayors of all the principal towns in Great Britain recently received a letter from the Controller of Coal Mines, asking them to organize a local committee for the distribution of coal during the coming winter. The suggested constitution of such a committee was as follows:—The mayor or deputy, the chief constable, two coal merchants, one representative of each railway, one representative of each canal, and a secretary. The railway and canal representatives were to act in an advisory capacity only. A letter suggesting labor representation was sent to each mayor or deputy at a subsequent date.

THE RUSSIAN RAILWAYS SITUATION

The following is taken from correspondence of the Associated Press in the (New York) Mail:

John F. Stevens and his associates on the American Railway Commission now in Russia to assist the administration of Russian railways to increase their efficiency, have discovered many ways in which transportation may be speeded up on all lines without additional equipment.

The commission has advised the United States government to supply Russia with 2,500 more locomotives and 40,000 more freight cars as soon as possible. However, it will be long before this rolling stock can be manufactured and shipped to Russia. The shortage of bottoms on both Atlantic and Pacific will delay delivery of the new rolling stock, and additional shops must be erected at Vladivostok before such great quantities of locomotives and cars can be put together speedily.

The Russian roadbeds are in excellent condition. Virtually all lines were well built and the tracks have been kept up, chiefly through work of peasant women, in spite of the shortage of labor created by the heavy war draft upon the male population.

After traveling the full length of the Trans-Siberian line and inspecting many important lines in central and southern and European Russia, the American engineers found that Russian railway men are working at great disadvantage in not having up-to-date equipment for coaling, watering and cleaning locomotives.

At nearly all stations in both European and Asiatic Russia, engines are watered by 8-in. pipes. From 12 to 20 minutes is required for work which is accomplished in the United States in four or five minutes.

By the Russian methods 24 hours is required to clean a locomotive, coal it and get up steam again. The Russian engine houses lack the hot water equipment. Engines are allowed to cool before they are washed.

Oil is used as fuel for locomotives in southern Russia, but in Siberia and northern European Russia coal and wood are fuel. The facilities for loading wood are bad and plans are under way to improve the system. Water is supplied to passenger cars by buckets at most stations. Few stations have the hose necessary to water cars in a hurry. These have not been required because engines took water so slowly and labor was so abundant that it was possible to supply the cars with water by hand while the locomotive was being cared for.

But now even the labor of women must be economized as much as possible. Women are required in the fields. They are the baggage handlers at most stations, and are even firing locomotives. Wages necessarily have risen with the increased cost of living and every possible labor saving device must be used.

Because of the lack of skilled labor, the inadequacy of repair shops and the scarcity of metals and other supplies many locomotives on the Russian railways are out of repair. The American engineers have advised an immediate extension of repair shops and employment of foreign mechanics if necessary to restore these locomotives to service immediately.

Pig iron is among the needs of Russia which officials have reported to the American experts. Worn rails and other iron and steel have been used prodigally by the railways in construction work. At nearly every railway station in Russia tons of old steel rails are in use as hand railings.

They are used at railway crossings for fences and are found in many other places on railway property where wood would serve as well. In the larger centers hundreds of tons of old steel and iron could be collected by the government from railway property on short notice. This material would meet the urgent demand for iron without placing further

burden upon overloaded ships, and it is not unlikely that the government will avail itself of this metal.

Railway administration in Russia is not centralized sufficiently to get the greatest possible service out of tracks. Trains are operated on local orders. By the employment of division superintendents and institution of a more general system of dispatching, the American engineers believe, greater service can be obtained from all lines.

Since the overthrow of the emperor, railway employees have chosen their own officials. The success of such a system is doubtful. But it was necessary, apparently, to throw off the domination of the old bureaucracy.

THE PRESIDENT FIXES THE PRICE OF COAL

President Wilson in accordance with authority granted by Congress has issued the following proclamation:

WHITE HOUSE,
Washington, Aug. 21, 1917.

The following scale of prices is prescribed for bituminous coal at the mine in the several coal-producing districts. It is provisional only. It is subject to reconsideration when the whole method of administering the fuel supplies of the country shall have been satisfactorily organized and put into operation. Subsequent measures will have as their object a fair and equitable control of the distribution of the supply and of the prices, not only at the mines but also in the hands of the middlemen and the retailers.

The prices provisionally fixed here are fixed by my authority under the provisions of the recent act of Congress regarding administration of the food supply of the country, which also conferred upon the Executive control of the fuel supply. They are based upon the actual cost of production and are deemed to be not only fair and just but liberal as well. Under them the industry should nowhere lack stimulation.

WOODROW WILSON.

Note.—Prices are on f. o. b. mine basis for tons of 2,000 pounds.

	Run of Mine	Prepared Sizes	Slack or Screenings
Pennsylvania	2.00	2.25	1.75
Maryland	2.00	2.25	1.75
West Virginia	2.00	2.25	1.75
West Virginia (N. River)	2.15	2.40	1.90
Virginia	2.00	2.25	1.75
Ohio (thick vein)	2.00	2.25	1.75
Ohio (thin vein)	2.35	2.60	2.10
Kentucky	1.95	2.30	1.70
Kentucky (Jellico)	2.40	2.65	2.15
Alabama (big seam)	1.90	2.15	1.65
Alabama (Pratt, Jagger and Corona)	2.15	2.40	1.90
Alabama (Cahaba and Black Creek)	2.40	2.65	2.15
Tennessee (Eastern)	2.30	2.55	2.05
Tennessee (Jellico)	2.40	2.65	2.15
Indiana	1.95	2.30	1.70
Illinois	1.95	2.30	1.70
Illinois (third vein)	2.40	2.65	2.15
Arkansas	2.65	2.90	2.40
Iowa	2.70	2.95	2.45
Kansas	2.55	2.80	2.30
Missouri	2.70	2.95	2.45
Oklahoma	3.05	3.30	2.80
Texas	2.95	3.20	2.40
Colorado	2.45	2.70	2.20
Montana	2.70	2.95	2.45
New Mexico	2.40	2.65	2.15
Wyoming	2.50	2.75	2.25
Utah	2.60	2.85	2.35
Washington	3.25	3.50	3.00

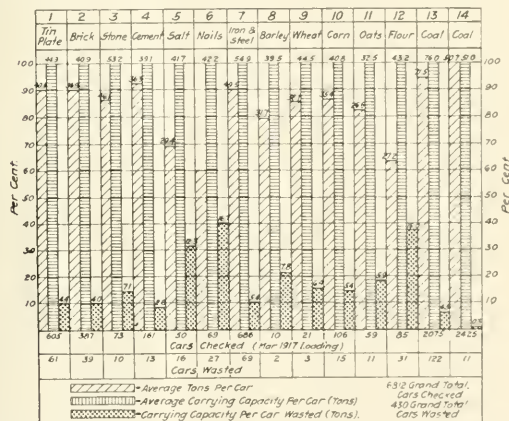
ITALY EXTENDS AERIAL MAIL SERVICE.—In addition to the recent establishment of aerial mail service between Turin and Rome, Consul General David F. Wilbur, of Genoa, Italy, reports the successful inauguration of an aerial postal service between the Italian mainland and the island of Sardinia on June 27, and between Naples and Palermo (Sicily) on June 28.

DETERMINATION OF CAR REQUIREMENTS OF A RAILROAD*

During the course of a recent conversation with Mr. A. I was asked the question, "How many freight cars should the North & South Railroad Company own in order to meet the demands of commerce upon it?"

My answer to the question was in substance that freight cars owned by the North & South Railroad Company, considered without reference to classification were probably sufficient to meet satisfactorily a large percentage of what might be termed normal or average requirements, providing the cars be maintained properly, handled efficiently, and the carrying (or cubical) capacity utilized fully, but that the classified freight car requirements could be determined only by analyzing carefully those details of operations applicable to a series of months which reflect clearly the relationship of the supply of each class of freight cars to the demands for each class of freight cars, and that I would undertake to develop such facts as could be accepted as a reliable basis for a formal answer to his question.

Many theories and opinions have been advanced with reference to the true measure of a railroad's obligations from the standpoint of freight cars required to enable it to render reasonable service as a common carrier, these theories and



Statement Used by the Pennsylvania Lines West of Pittsburgh Showing the Percentage of Journal or Cubical Capacity of Freight Carrying Cars Utilized by Shippers of Various Commodities at "Car Load" Rates During March, 1917

opinions having crystallized into two quite distinct and logical conclusions, namely:

1. That on account of the diversity of traffic conditions, and the fact that to a large extent each individual carrier line serves territory which produces traffic not common to territories served by all other lines, forming parts of through routes over which traffic moves, the obligations of an originating carrier should be to provide a sufficient number of cars to accommodate traffic of shippers served by it regardless of what might be the destination of the traffic, this conclusion being especially significant in its relation to the products of certain industries in the Pittsburgh district, which are distributed throughout the United States, including Mexico and Canada, although cars conforming to a special design are required for the transportation of them; and

*Excerpt from letter written by a transportation officer of one of the larger railroads relative to the classified freight car requirements of that system.

2. That traffic which comes to a railroad irrespective of the character, or source of the traffic, constitutes the measure of that company's obligations in the nature of car supply as a common carrier, the measure of responsibility as between (or among) carriers which participate in earnings from the transportation of traffic via a joint through route being dependent upon different factors, the more prominent of which are:

(a) The *permanency* of traffic, i. e., the known ability of a carrier to prevent diversions of traffic to other roads;

(b) Ratio of mileage (road-haul) of each carrier forming part of a joint through route to the total mileage (length of the joint through route);

(c) Ratio of gross earnings of each carrier forming part of a joint through route to the total gross earnings of all interested carriers derived from the transportation of traffic;

(d) The general nature of service other than road service incident to the handling of traffic on each of the lines forming part of a joint through route;

(e) The average detention per car to cars engaged in through service; and

(f) The ratio of the empty mileage on each line forming part of a joint through route of cars engaged in the through service, to the total mileage made by such cars on the joint through route.

The correctness of the first conclusions could not be questioned if disposition of the majority of all classes of freight which represent the larger volume of traffic handled by carriers, conformed to spasmodic and irregular orders requiring distribution of the traffic among a great variety of destinations, but this is not true, the fact being that producers of practically all classes of traffic find permanent markets for it and establish permanent arrangements governing its movement, the exceptions to this customary or general order of things being:

First. The outgrowth of such extraordinary conditions as those which prevail at the present time;

Second. The natural consequences of inferior service on the part of certain carriers in comparison with service on the part of other carriers;

Third. The results of radical commercial developments in new localities; and

Fourth. Demands for cars of a peculiarly special type required for the transportation of traffic which will ordinarily seek markets where the most favorable prices obtain.

In support of the first conclusion, it seems proper to state that if the business conditions were to remain permanently on substantially the same basis as the basis which we consider extraordinary, and attributable to the war involving both the old and the new world, a common carrier could not afford to authorize large expenditures for the acquisition of new cars for the reason that its representatives would be without any means whatever of controlling the movement of traffic via a certain route, laws and decisions of the Interstate Commerce Commission prohibiting carriers from dictating as to the routing of traffic, but compelling them to permit of the movement of freight cars to any destination in North America covered by a joint route and through rate.

If history of the past may be accepted as a reliable guide for speculation pertaining to the future, it is reasonable to believe that carriers should not base their developments with reference to increasing the number of freight cars upon the extraordinary situation now prevailing, but upon the more substantial and normal business conditions which preceded and which will follow the present conditions; hence I feel that the second conclusion rests upon the correct principle, and my efforts to determine the classified car requirements of the North & South have been exerted in that direction.

From my standpoint, neither the kind of traffic which offers for movement via the lines of a common carrier, nor information with reference to its origin or destination, has

a direct bearing on the obligation of that carrier to furnish cars beyond the limits to which the volume of traffic varies from time to time, and that result is determinable by the consideration of three details, namely:

I. The average number of classified cars on the lines of a common carrier, daily;

II. The number of classified cars owned daily during a period to which the first detail applies; and

III. The ratio of classified cars furnished applying on orders to the total number of classified cars ordered during a period to which the first two details apply.

In other words, were all carriers to decide arbitrarily that not a single system car would be permitted to go beyond the limits of their lines, and that not a single foreign car would be accepted in interchange, the obligation of each carrier from a car supply point of view, would be represented by the number of cars required to take care of strictly internal business; through traffic from junction points with connecting lines to junction points with other connecting lines; traffic from junction points with connecting lines to local stations; and traffic from local stations to junction points with connecting lines.

We have, of course, grown beyond such a scheme, but the principle underlying it is perfectly sound in its application to the present arrangement, which contemplates the free interchange of cars among various parts of what the Interstate Commerce Commission has elected to term the "National Railway System." Under this (present) arrangement, there are a certain number of each of different classes of freight cars in the possession of the North & South each day, or an average number daily within each calendar month; and calendar year. Numerous conditions affect this detail, and it is therefore a variable one, the changes being influenced largely by variations in business conditions. These facts preclude the use of the detail, applicable to the operations of one period, as a measure for freight car requirements, but they lead logically to the conclusion that if the detail applicable to operations of each of a number of months when the car supply is slightly under the actual demands, considered in conjunction with the additional details, number of each class of cars owned, and the ratio of each class of cars furnished applying on orders to the number of each class of cars ordered, the results thus obtainable can not be other than the number of cars of each class required to handle the traffic. Example: the average number of box cars on a line daily, based on operations of several months, is represented by 6,000 cars. The number of box cars owned during the same period of several months is represented by 4,000 cars. The average number of cars required daily for loading at local stations during the period is represented by 2,000, of which 95 per cent are furnished. On this basis of the operations, 6,000 cars were used daily to meet the various demands; the average number of cars available daily for application to local orders was 100 cars short of the requirements and the average number of cars on the lines daily exceeded the ownership 2,000 cars, hence the cars owned were equal to about two-thirds of the cars required.

Unfortunately, records available did not embrace details which were essential to a satisfactory study of the operations of the North & South Railroad Company, in connection with the handling of cars during several years, but from information which I have obtained from special reports and statistics, the diagram was prepared and has been used as the basis for conclusions as to the classified freight car requirements of the North & South.

AGED MEN RUN BRITISH ENGINES.—Overcome by the heat, a London & North-Western engineer, aged 71, fell off the footplate of his engine at Birmingham and was killed. Owing to the war, the company, it developed, has many men over 70 years of age working local trains.

THERMOSTATIC METAL

The General Electric Company, Schenectady, N. Y., has perfected a new product designated as G-E Thermostatic Metal which takes a curve or regains its original straightness in accordance with well defined laws as the temperature rises or falls. As a result of this responsiveness to temperature change and the mechanical force developed, this metal is used to actuate various mechanisms which tend to neutralize either the temperature change or its effect upon devices.

The metal is made up of two strong non-corrosive metals possessing a wide difference in co-efficients of expansion, the widest difference possible for any known stable combination of metals. These two metals are firmly attached to each other throughout their entire length so that there is absolutely no slip of the one upon the other. Thermostatic metal can be cut, stamped or pressed into practically any desired shape, and when annealed will have all its original inherent qualities; moreover, it will not deteriorate nor take permanent set under applications of heat or force within definite practical limits. The metal is manufactured in various standard thicknesses ranging from 0.25 to 0.015 in.; the maximum width is 4 inches and the maximum length is 36 inches.

This metal can be used for temperatures as high as 500

The length or thickness of the metal alone affect the deflections of the metal, the width of the piece having no influence. From these curves it will be found that the deflection for any given temperature change varies directly as the square of the length of the piece of thermostatic metal and inversely as the thickness of the piece. As previously pointed out, the deflection of any piece of metal varies directly as the temperature change.

This metal is used in the products of many different industries owing to the fact that it can be successfully worked into different shapes and forms. In some of its applications it is used to actuate mechanisms directly by means of the force developed within itself when its tendency toward assuming a curved shape is restrained. In other applications it is used to close and open the contacts of electrical circuits by means of which various devices are operated.

STANDARD GAGE IN EUROPE.—The disadvantages of the variety of gages within this Empire has been keenly felt during the war. Had there been a universal gage rolling stock might have poured in from all parts to points where it was most wanted. But something more than a universal track-gage is wanted if the full benefits are to be obtained from it. When it was proposed to exhibit some of the French locomotives in England it was found that they could

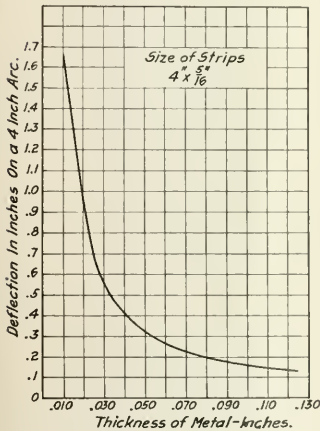


Fig. 1.—Deflections Caused by a Temperature Change of 100 Deg. F.

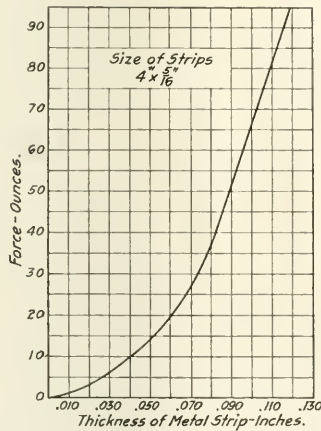


Fig. 2.—Force Required to Give Permanent Set

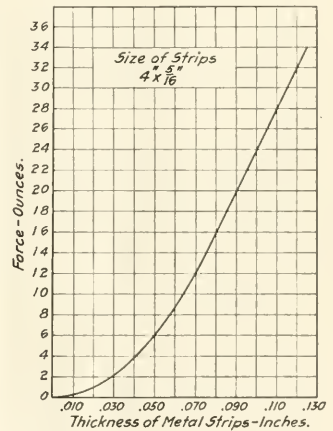


Fig. 3.—Force Exerted by Metal Strip at 100 Deg. F.

deg. F. The deflection per degree temperature change besides being quite considerable as shown by Fig. 1 is a constant for any definite piece of the metal, and since a definite and considerable opposing force is necessary to cause the metal to take permanent set (see Fig. 2), the metal can be depended upon when used in devices where extreme accuracy is required.

If the curving of this thermostatic metal on heating or cooling is opposed, the metal will produce a mechanical force (see Fig. 3), which is limited only by the force required to produce permanent set. For example, Fig. 3 shows that a piece of thermostatic metal 0.1 in. thick, $\frac{5}{16}$ in. wide and 4 in. long will exert a force of 24 ounces ($1\frac{1}{2}$ lbs.) on being restrained from bending when subjected to a temperature change of 100 deg. F. This curve illustrates the laws that the force exerted by this metal varies as the square of the thickness, directly as the width and as the square of the temperature.

not be run over English lines to their destination owing to their rolling stock dimensions fouling our minimum fixed structures. This fact will tell heavily against the usefulness of the channel tunnel, as it will prevent that free interchange of rolling stock without which traffic will be greatly hampered. The world is shrinking so rapidly that the different gages in Africa, in India, in Russia, and even in Ireland are rapidly becoming an intolerable nuisance, and, in time, it will be found absolutely essential to bring them all to one standard, including the running and fixed dimensions; if the smallest of these, on the 4 ft. 8 $\frac{1}{2}$ in. gage, be selected as the standard, the conversion could be effected gradually at comparatively little cost. A difference in gage has been considered a safeguard against invasion, both in Russia and in India. As regards Russia's European and Eastern Asian boundaries the break of gage has not stopped invasion and has hampered the defenders as much as it has the offenders.

General News Department

The National Association of Railway Agents concluded its semi-annual meeting at Cedar Point, Ohio, on August 16.

The old stone arch bridge, which was described in the *Railway Age Gazette* of August 17, 1917, page 278, is located at Gwynn's Falls, on the Mt. Clare branch of the Baltimore & Ohio, near Baltimore.

Senator Owens has introduced a bill to authorize the Interstate Commerce Commission to determine when a car shortage exists on a railroad, and to order the road to provide sufficient and suitable cars.

According to the Southern Pacific Bulletin the Southern Pacific reports that the average carload on the Portland division has been increased to 26.5 tons in June, 1917, as compared with 22.3 tons for the same month in 1916, or an improvement of nearly 19 per cent.

The Atchison, Topeka & Santa Fe has announced an increase in wages, ranging from 11 to 15 per cent, to car and locomotive employees. This increase is in addition to the ten per cent bonus which will be paid at the end of December. The new scale will go into effect September 1.

Because of the increased value of scrap paper, the Southern Pacific has adopted a policy of retaining magazines, old records, newspapers, etc., for shipment to the stationery storekeeper at West Oakland, Cal. During the month of June the West Oakland collecting office disposed of nearly 16,000 lb. of waste paper that had been forwarded from all parts of the Pacific system.

Announcement is made in another column of the appointment of Elisha Lee, general manager of the Pennsylvania Railroad, as acting vice-president in charge of operation during a leave of absence granted to W. W. Atterbury. No official announcement has been made of the reasons for the leave of absence granted Mr. Atterbury, but it is understood that he will go to Europe, and be in charge of certain phases of the transportation system of the Allies.

The Southern Pacific has announced that nearly \$4,000 in bonuses will be paid to the 86 employees of the system who have left the service of the company to enter the army or navy. By leaving the employ of the road employees forfeit all claim to the second half of the ten per cent bonus which was payable on June 30 to employees in active service, but notice has been given that such breaks in the service as were occasioned by enlistment will be waived and the bonuses paid.

Heavier loading enabled the Baltimore & Ohio to save the use of 6,238 cars in the handling of less than carload freight in July, compared with the same month last year. At the same time the company handled 12,000 more tons of this class of freight in 4,000 less cars, according to the report of the transportation department which has just been compiled. Last month the Baltimore & Ohio handled 1,393,660 cars in freight trains, 928,684 of which were loaded. While the loaded car movement is indicative of the general business activity, hot weather interfered somewhat. It is expected that the company will handle more than 1,000,000 loaded cars monthly during the fall.

The Rock Island Lines have issued a colored map of the United States showing the locations of national guard mobilization training camps, national army cantonment camps, reserve officers' training camps and government aviation sites. The regular army departments are shown by solid dividing lines, and are also named. The 16 new national army divisions are shown in separate colors, each camp being indicated by a circle, name and number. The national guard camps are indicated by blue stars, with the name of each, together with the names of the state which will be represented at each camp. Reserve officers' training camps and aviation sites, as well as forts, are shown in a distinctive way.

R. J. Clancy, assistant to the general manager of the Southern Pacific, has pointed out that railroad transportation is probably the only product, relatively speaking, that has decreased in price. "As indicated by the purchasing value of commodities," says Mr. Clancy, "railroad transportation is now approximately 50 per cent cheaper than three years ago. A bushel or sack of wheat, corn or barley, a bale of cotton or wool, or a ton of copper, iron or steel will buy approximately double the amount of railroad transportation it would three years ago. This is regardless of the fact that during the last three years wages of railroad employees and the cost of capital have greatly increased along with an increase of 100 per cent in the cost of fuel oil for locomotives and an increase of from 50 to 500 per cent in the cost of railway supplies, equipment and material."

The Committee on the Safe Transportation of Explosives and Other Dangerous Articles, of the American Railway Association, recently issued a bulletin to members containing additional rules and recommendations prepared by the Bureau of Explosives, covering the handling of dangerous traffic, with special reference to conditions incident to war requirements. The rules provide that properly qualified railway representatives shall be put in charge at all points where explosives or dangerous articles are handled or held for any purpose, whose duty it shall be to see that all employees comply with safety regulations. The regulations also provide that authorized persons only shall be permitted on railroad property used for the storage, handling, loading or unloading of dangerous articles, and specify in detail who shall constitute "authorized" persons. Necessary safety precautions which must be enforced at points where dangerous freight is handled are enumerated.

Mileage Allowance on Refrigerator Cars Increased

The American Railway Association has issued a circular announcing an increase, effective on October 1, in the mileage allowance paid for the use of refrigerator cars from $\frac{3}{4}$ of a cent to one cent per mile in eastern and southern territory, where the $\frac{3}{4}$ -cent rate now applies. The rate in western territory has been one cent.

American Railroad Men Needed in Russia

J. F. Stevens, chairman of the railroad commission making an investigation of the railway situation in Russia, has telegraphed to Washington requesting that an American railway unit of 129 men, consisting of division superintendents, dispatchers, trainmasters, engineers, master mechanics and one telephone expert, be despatched to Russia to educate the Russian railway men in American operating methods. The request has been referred to S. M. Felton, director general of railways, in charge of the organization of railway forces for service abroad.

Railroads Help Potato Conservation

A pledge made by the representatives of the railroads of practical co-operation in handling this year's big potato crop will greatly help plans for potato conservation, according to a statement issued by the Food Administration.

Equitable distribution of the crop is a great problem concerning the grower, the government and the public at large. The harvest of late potatoes runs for about six weeks, and the railroads have stated that it will be possible for them to handle approximately one-third of the crop during this time if shippers will see to it that cars are loaded to a maximum capacity of from 46,000 to 50,000, instead of 40,000 pounds, and also see to it that they are unloaded within 24 to 36 hours of their arrival at destination. Under the recent ruling of the Federal Reserve Board another one-third of the crop may be stored, later to be distributed as market demands afford opportunity, the remaining third to be stored by owners.

The recent ruling of the Federal Reserve Board in favor of

the issue of warehouse receipts, negotiable at member banks, on potatoes when properly graded, sacked and stored, is said to assure ample money with which to handle the big reserve stock, and to a large extent eliminate the waste of former years, caused by poor market facilities or glutted market terminals.

War Convention of American Business Men

A war convention of American business men has been called by the Chamber of Commerce of the United States, to be held at Atlantic City, N. J., September 18 to 21, inclusive. The general subjects discussed will be: The duty that business owes the government in war; How may the business of the country render greater service in winning the war? Ways and means by which business may most readily adjust itself to the conditions produced by the war, and For what readjustments after the war must business prepare? Under the general subject of How business may render greater service in the war, will be discussed the question, How shall greater efficiency of land and water transportation be developed?

New York Port Commissions Organize

The two commissions appointed by Governor Edge, of New Jersey, and Governor Whitman, of New York, to investigate the port conditions at New York, organized Wednesday in New York by electing J. Spencer Smith and William R. Willcox, respectively, chairman of the two commissions. General George W. Goethals was appointed chief consulting engineer, and will confer frequently with the commissioners.

The work, Mr. Willcox explained after the meeting, will pertain to all matters which affect the development of the port, the Jersey Meadows and all territory contiguous to the port, and when completed, it is expected, will result in more harmonious relations between the two states. The railroads will be consulted in the working out of terminal plans, etc., as will storage, warehouse and steamship companies. The commissions, after they have concluded their investigations, will make reports to the New Jersey and New York legislatures.

On the New York commission are William R. Willcox, E. H. Outerbridge and Arthur Curtis James, while on the Jersey commission are J. Spencer Smith, De Witt Van Buskirk and Frank R. Ford. Offices will be established at 115 Broadway, New York.

Frankness as an Element in Efficiency

Under the title, "Some Facts to Remember," E. E. Loomis, president of the Lehigh Valley, has posted, for the benefit of the employees of that road, a placard on the hackneyed subject of efficiency, but the placard is not hackneyed; it is notable for its freshness, and also for its excellent typography. Extracts follow:

Real Service: When we sell a ticket we sell more than a ride. When we issue a bill of lading our obligation extends beyond the mere movement of freight. In each case our patrons are entitled to and must receive prompt, courteous and accurate information and attention.

Passenger Service: If a train is late, say so. If you don't know how late it is, find out. If you expect or can get a later report, state when it will be available. Give special attention to the comfort of women and children. Help passengers to work out their train connections. Do not tell passengers Pullman space is unavailable until you are sure other stations cannot release space to you.

Do not argue. Passengers have a right to criticize railroad service. Criticism is frequently the basis of improvement. Improvement is the everlasting mark at which we must aim.

Trainmen: You are the official hosts of the company. You can make every passenger's trip a pleasant one. Make the passengers feel they are at home on one trip, and they will be with you on their next. This is more than good business policy; it is a manly—a courteous policy. It is the only policy.

Freight Service: Accepting freight is but the beginning of our service to a shipper. When he asks for information about that freight he is exercising a right—not seeking a favor. When a car is delayed, say so, and try to expedite its movement. If a car is lost, start the machinery that will locate it. Don't promise a shipper to place a car today if you know it cannot be placed until tomorrow.

If a shipper needs reports to satisfy a consignee, see that he gets them promptly and accurately. Help the shipper to hold his customers, and you will help us to hold the shipper as a customer. Give the shipper a maximum of service, attention and courtesy if you wish him to give you a maximum of tonnage.

GIVE REAL SERVICE.

The Extra Crew Law in New Jersey

The State Board of Public Utility Commissioners of New Jersey will begin hearings on September 17 relative to the application of railroads operating in the state to reduce the crews of specified trains. The trains affected are mostly freight trains, but there are some passenger trains on the list.

The roads contend there are now more men carried in the train crews of these trains than are needed. Applications are made under the repealer of the Full Train Crew law which was passed last winter, and became effective July 4. The law puts the matter in the hands of the Public Utility Commission. Railroads making the applications are: Central of New Jersey, Lehigh Valley, Delaware, Lackawanna & Western, Pennsylvania, West Jersey & Seashore, Philadelphia & Reading, Atlantic City, Lehigh & New England, Lehigh & Hudson River, and the Baltimore & Ohio.

It is understood that the trainmen have refused to accede to the withdrawal of any men of any train crew as now constituted. The trainmen intend to make each company prove that each reduction proposed is one where a full crew is not needed.

Army Section for Embarkation Service

A new section of the army general staff has been created to handle all business pertaining to the shipment of troops and supplies to Europe. Brigadier General Francis J. Kernan, assistant chief of staff, has been detailed temporarily as chief of the embarkation service, with Col. Chauncey B. Baker of the Quartermaster's Corps as his chief assistant. The functions of the section are explained in the following general order issued by the War Department:

"To enable the Chief of Staff to exercise effectively his supervisory and co-ordinating powers in respect to overseas movements there is hereby created in the office of the Chief of Staff, for the period of the existing war, a section to take charge of the embarkation of troops and supplies for transatlantic transportation, and to exercise under the Secretary of War the direct control incident to this service.

"The officer in charge is designated as the Chief of the Embarkation Service, and he will be given such assistance, commissioned and civilian, as may be necessary, with office rooms in the War Department building.

"The function of this section is to co-ordinate all shipments of munitions and supplies of every kind, and all troop movements whose ultimate destination is Europe, and to advise and assist the Chief of Staff in reference thereto. It will have direct supervision, under the Chief of Staff, of all movements of supplies from points of origin to ports of embarkation; will supervise the operations of the latter; and will control the employment of all army transports engaged in the transatlantic service and such commercial shipping as may be used to supplement that service. It will arrange with the navy for convoy service.

"It is made the duty of all chiefs of supply bureaus to keep the Chief of the Embarkation Service informed fully of the condition of supplies in their several bureaus, and to this end they will correspond directly with that officer. Direct correspondence between the Chief of the Embarkation Service and the commanding officers of ports of embarkation is authorized. Copies of all requisitions, requests, and information of every character received from the commanding general of our forces in Europe, or his subordinates, which bear upon reinforcements or renewals of supplies will be transmitted to the Chief of the Embarkation Service; and, in general, under the supervision of the Chief of Staff, this officer is charged with the duty of arranging that all supplies for our forces in Europe shall be forwarded in the most expeditious and convenient manner, and to that end he is authorized to call upon all supply officers for information and to exercise control in matters of shipment, both within the territory of the United States and in the overseas haul."

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE, 1917

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses				Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decrease) last year.	
		Freight.	Passenger.	Total (inc. misc.).	Maintenance of way and structures.	Traffic.	Transportation.	Miscellaneous.					
Ann Arbor	294	\$234,120	\$45,057	\$298,469	\$31,163	\$8,107	\$133,331	\$650	\$10,658	\$221,061	\$74,408	\$61,307	\$21,081
Atlantic City	234	100,370	196,104	310,539	29,552	2,993	18,331	99	919	310,539	86,384	18,273	1,714
Canadian Pacific Lines in Maine	234	100,370	196,104	310,539	29,552	2,993	18,331	99	919	310,539	86,384	18,273	1,714
Central of New Jersey	684	2,437,857	585,142	3,294,485	276,277	543,870	1,218,636	19,804	63,873	2,150,651	1,444,421	147,042	990,763
Chicago & Erie	270	656,437	59,360	775,790	66,763	19,965	318,636	2,038	16,874	526,581	240,268	31,275	217,933
Chicago, Burlington & Quincy	9,323	7,650,174	2,068,230	10,660,943	1,426,248	172,093	3,488,932	116,694	227,326	6,653,072	4,002,871	432,035	367,846
Chicago Great Western	1,496	969,408	326,826	1,427,841	136,798	189,571	475,063	11,704	17,047	906,708	521,133	59,000	48,135
Chicago, Terre Haute & Southwestern	375	2,674,551	126,084	2,844,635	1,754,877	1,075,078	276,578	48,265	3,327,467	3,327,467	48,265	3,327,467	48,265
Cum gratia	1,998	4,389,930	839,762	6,361,351	579,781	1,432,918	106,059	2,656,305	40,024	131,291	4,944,823	1,616,528	224,485
Georgia	307	187,553	74,829	283,639	37,134	13,963	117,610	176	8,923	220,222	63,417	5,890	29,423
Kansas City Terminal Co.	24	4,636,387	1,258,518	6,283,445	7,007	13,272	.....	.....	1,366	57,619	33,516	18,580	14,936
Louisville & Nashville	5,070	4,636,387	1,258,518	6,283,445	81,463	1,280,923	133,629	2,187,433	22,275	136,330	464,344	1,791,211	27,370
Mineral Range	120	86,839	2,858	92,318	25,843	18,013	600	53,465	1,005	98,918	6,570	6,570	12,499
Missouri, Oklahoma & Gulf of Texas	134	15,627	2,773	15,697	2,718	1,843	1,372	7,275	1,435	14,632	1,047	184	34,991
Nevada Pacific	7,025	4,851,543	1,055,509	6,907,052	964,233	945,374	151,944	2,037,879	20,576	142,105	4,207,662	214,037	265,000
Nevada Southern	6,083	1,304,442	17,807	217,289	27,199	33,412	567	37,080	55	5,231	93,554	20,156	103,572
New York Central	1,665	13,904,442	2,156,234	16,060,676	3,213,766	2,066,129	295,453	7,707,435	301,581	450,590	14,624,964	6,937,270	980,788
Oregon Short Line	2,307	1,993,257	155,568	2,147,341	343,619	37,072	672,331	46,969	78,977	1,440,322	1,307,028	115,181	130,713
Oregon-Washington R. & Nav. Co.	5,052	1,919,891	471,214	2,099,654	298,830	178,371	47,006	664,326	31,306	82,094	1,001,539	96,618	161,636
Philadelphia & Reading	1,143	1,182,215	68,533	1,250,748	40,315	101,244	54,912	2,725,466	15,036	93,364	3,661,626	127,703	1,634,460
Pittsburgh & West Virginia	63	118,215	10,070	138,399	19,602	17,612	2,399	46,834	4,338	60,391	41,553	8,217	33,335
Pittsburgh, Shawmut & Northern	205	85,290	4,828	92,997	18,433	47,597	1,145	45,702	.....	118,900	25,903	1,774	46,612
Port Reading	21	147,166	.....	169,236	12,819	9,338	.....	.....	.....	141	97,689	.....	47,462
St. Louis, Iron, Mountain & Southern ¹	4,752	3,057,252	1,172,953	4,250,205	433,228	63,886	69,111	1,407,635	.....	146,924	2,782,261	1,827,386	191,110
St. Louis Southwestern	1,734	997,013	242,310	1,217,574	157,336	243,318	248,157	391,899	4,734	1,607,362	1,911,0	1,634,569	205,165
Staten Island Rapid Transit Co.	24	51,994	65,538	133,247	15,157	13,511	1,552	61,859	5,793	97,862	35,886	9,000	17,590
Texasiana & Fort Smith	87	71,395	11,808	90,778	6,333	4,687	2,972	26,397	4,120	44,118	46,360	38,921	26,360
Utter & Delaware	129	51,464	32,103	104,218	9,475	10,551	4,472	48,866	400	6,514	23,940	19,952	19,843
Union Pacific	3,622	4,482,806	1,220,162	6,500,564	791,536	120,920	1,572,565	140,993	185,081	3,407,865	456,948	2,635,541	1,986,360
Ann Arbor	294	\$1,198,129	\$240,433	\$1,528,218	\$145,397	\$257,785	\$32,657	\$708,503	\$54,471	\$1,201,411	\$326,806	\$78,086	-\$69,352
Atlantic City	120	129,994	604,072	1,412,261	158,053	20,271	19,472	703,216	4,451	1,014,525	187,695	65,000	7,099
Canadian Pacific Lines in Maine	234	3,399,994	1,121,221	4,521,215	1,550,553	326,771	19,472	1,816,280	4,451	1,014,525	187,695	65,000	7,099
Central of New Jersey	684	13,169,075	2,771,698	17,559,431	3,299,468	1,677,763	1,677,763	1,677,763	388,253	12,215,305	3,341,118	906,116	4,937,662
Chicago & Erie	270	3,582,615	276,237	4,208,112	444,013	537,869	112,114	1,747,462	102,395	3,032,769	1,185,342	187,650	390,680
Chicago, Burlington & Quincy	9,323	4,282,645	1,588,988	5,869,204	67,312	834,918	852,678	1,737,838	807,891	1,317,315	37,992,962	2,582,392	2,017,198
Chicago Great Western	1,496	5,414,466	1,686,543	7,834,877	956,800	274,316	3,099,415	69,698	265,238	6,025,950	1,808,926	331,000	1,492,438
Chicago, Terre Haute & Southwestern	375	2,674,551	126,084	2,844,635	1,754,877	1,075,078	276,578	3,327,467	48,265	3,327,467	48,265	3,327,467	48,265
Clinton, South Shore & Atlantic	600	1,482,627	333,637	2,059,964	400,492	264,694	42,577	884,337	34,353	1,279,044	31,970	143,378	143,378
Cum gratia	1,998	25,435,923	4,583,126	33,939,049	2,878,995	8,350,413	570,316	15,411,441	219,246	765,640	28,185,493	5,211,912	3,411,928
Georgia	307	1,171,955	433,584	1,741,975	138,933	284,213	81,751	722,108	926	56,039	1,394,383	34,415	403,055
Kansas City Terminal Co.	24	26,912	7,071	35,863	557,851	45,503	75,851	.....	4,268	12,817	357,293	300,519	109,260
Louisville & Nashville	5,070	4,658,545	1,558,545	6,283,445	81,463	1,280,923	133,629	2,187,433	22,275	136,330	464,344	1,791,211	27,370
Mineral Range	120	86,839	2,858	92,318	25,843	18,013	600	53,465	1,005	98,918	6,570	6,570	12,499
Missouri, Oklahoma & Gulf of Texas	134	15,627	2,773	15,697	2,718	1,843	1,372	7,275	1,435	14,632	1,047	184	34,991
Nevada Pacific	7,025	4,851,543	1,055,509	6,907,052	994,233	945,374	151,944	2,037,879	20,576	142,105	4,207,662	214,037	265,000
Nevada Southern	6,083	1,304,442	17,807	217,289	27,199	33,412	567	37,080	55	5,231	93,554	20,156	103,572
New York Central	1,665	13,904,442	2,156,234	16,060,676	3,213,766	2,066,129	295,453	7,707,435	301,581	450,590	14,624,964	6,937,270	980,788
Oregon Short Line	2,307	1,993,257	155,568	2,147,341	343,619	37,072	672,331	46,969	78,977	1,440,322	1,307,028	115,181	130,713
Oregon-Washington R. & Nav. Co.	5,052	1,919,891	471,214	2,099,654	298,830	178,371	47,006	664,326	31,306	82,094	1,001,539	96,618	161,636
Philadelphia & Reading	1,143	1,182,215	68,533	1,250,748	40,315	101,244	54,912	2,725,466	15,036	93,364	3,661,626	127,703	1,634,460
Pittsburgh & West Virginia	63	118,215	10,070	138,399	19,602	17,612	2,399	46,834	4,338	60,391	41,553	8,217	33,335
Pittsburgh, Shawmut & Northern	205	85,290	4,828	92,997	18,433	47,597	1,145	45,702	.....	118,900	25,903	1,774	46,612
Port Reading	21	147,166	.....	169,236	12,819	9,338	.....	.....	.....	141	97,689	.....	47,462
St. Louis, Iron, Mountain & Southern ¹	4,752	3,057,252	1,172,953	4,250,205	433,228	63,886	69,111	1,407,635	.....	146,924	2,782,261	1,827,386	191,110
St. Louis Southwestern	1,734	997,013	242,310	1,217,574	157,336	243,318	248,157	391,899	4,734	1,607,362	1,911,0	1,634,569	205,165
Staten Island Rapid Transit Co.	24	51,994	65,538	133,247	15,157	13,511	1,552	61,859	5,793	97,862	35,886	9,000	17,590
Texasiana & Fort Smith	87	71,395	11,808	90,778	6,333	4,687	2,972	26,397	4,120	44,118	46,360	38,921	26,360
Utter & Delaware	129	51,464	32,103	104,218	9,475	10,551	4,472	48,866	400	6,514	23,940	19,952	19,843
Union Pacific	3,622	4,482,806	1,220,162	6,500,564	791,536	120,920	1,572,565	140,993	185,081	3,407,865	456,948	2,635,541	1,986,360

Committee on Restoration and Employment

At the special meeting of the Association of Railway Claim Agents held at Chicago on August 10, the question was brought up of appointing a committee to consider ways and means of providing for those who are injured by reason of the war or from any other cause, and incapacitated for the work in which they were formerly employed.

After considerable discussion the following committee, to be known as the Committee on Restoration and Employment, was appointed: F. V. Whiting, chairman, general claims attorney, New York Central; John S. Rockwell, general agent, Buffalo, Rochester & Pittsburgh; S. J. Peterson, general claim agent, Union Pacific; H. B. Hull, general claim agent, Illinois Central; C. W. Egan, general claim agent, Baltimore & Ohio.

St. Louis-San Francisco Establishes School for Women

The St. Louis-San Francisco has undertaken the employment of women to fill such vacancies as occur from time to time where the work can be satisfactorily handled by women. In order to handle the work intelligently the company has organized a "bureau of employment for women," and G. E. Whitlam, inspector of transportation and maintenance, has been placed in charge, with headquarters at Springfield, Mo. The duties of the bureau will be: (1) To list every woman in the employ of the company as regards her present occupation, salary and ability, so that provision may be made for finding better positions for those in its employ and filling their positions with other women, which will result in the present women employees being given promotion according to their ability. (2) To canvass the entire railroad in order to ascertain what positions can be filled by women when vacancies occur. (3) To provide women for vacancies now existing, either by promoting those in the service or by new employees.

The company will give preference to members of families of employees, and to widows and female members of the families of men who were in its service at the time of their death. The object in giving preference to female members of families is: (1) It is thought that they are entitled to this consideration if they wish to work. (2) Having been raised in a railroad environment it is reasonable to assume that they will learn the work readily. (3) Unfortunately some of the employees' families do not have the opportunity to place their girls in desirable and remunerative positions in which the bureau will be in a position to assist. No applications will be considered where the applicant is less than 16 years of age or more than 40. Applicants will be required to fill out an application blank and, if accepted by the examiner, will be required to pass a modified physical examination to insure the fact that none but the physically fit are employed. A fee of one dollar will be charged for the examination, to be paid to the company physician, and an additional fee of one dollar will be charged for vaccination if required. If the applicant is successful in passing the examination, the bureau will list her as available for employment and will undertake to find employment for her in the order in which the application was received, except where previous experience, training and ability may qualify some in preference for the position taken.

The responsibility of the bureau will not end when a woman is placed in a position, but it will undertake to find her a respectable place to board and to see that she is properly instructed in the work to be performed. As a great many of the women desiring to enter railroad service cannot do so on account of lack of previous training, it is the purpose of the St. Louis-San Francisco to organize at Springfield, Mo., as soon as it can be done, a school where women who are selected for employment can secure proper training. The company will provide the tuition, instruction blanks, stationery, etc., free, and the only expense the student will be put to will be for board and room during the period of instruction, the duration of which depends upon the student and the position for which she undertakes to qualify. It is thought that three months' training will be sufficient. In some cases where women members of employees' families desire to enter school, but do not have the funds, the company will undertake to advance a sufficient sum of money to meet expenses, this to be repaid by the students on the installment plan after they have obtained positions, provided some responsible employee of the company will guarantee reimbursing

the company in the event the student fails or refuses to qualify or accept a position.

Illinois Roads Break Coal Traffic Records

In a hearing on the question of fixing coal prices in Illinois before Chief Justice Carter of the Illinois Supreme Court, at Chicago on August 17, R. H. Aishton, president of the Chicago & North Western, and Charles H. Markham, president of the Illinois Central, showed that the carriers of Illinois, as well as those of the other states, have moved more coal in recent months than ever before in their history.

Mr. Markham stated that one of the first orders issued by the Railroads' War Board provided that preference be given to the movement of coal and iron ore, and that every effort be made to secure increased car efficiency. The operation of the railroads of the United States by the board as a single system, eliminating individual and competitive activities, and the extraordinary efforts put forth by both carriers and shippers to increase car mileage and car loading, resulted in an increase of 16 per cent in freight traffic in May, the first full month following the organization of the board, with practically the same number of cars and locomotives as in the corresponding month in 1916. For the four months, April to July, inclusive, the coal-carrying roads of Illinois represented at the hearing (the Illinois Central, the Chicago & North Western, the Chicago & Eastern Illinois and the Chicago, Burlington & Quincy) loaded 7,173,746 tons more coal than in the corresponding period in 1916. Mr. Markham was of the opinion that even better records would be achieved if the State Public Utilities Commission made certain changes in demurrage and reconignment rules recommended in a report recently prepared by a committee representing the coal operators and railroads following conferences with the State Council of Defense.

Mr. Aishton stated that reports for April, May, June and July, 1917, indicated an abnormally large movement of both anthracite and bituminous coal by the railroads of the country. During that period 753,451 cars of anthracite coal were handled on nine roads, or an increase of 20 per cent over the previous year; and 3,448,699 cars of bituminous coal were handled on 110 railroads, an increase of 28 per cent over 1916. Coal movements, he said, had never before averaged so many miles per day, and through the co-operation of shippers the average load of coal per car has been increased nearly 10 per cent, which has been automatically reflected in an increase of 10 per cent in the supply of empty cars. The Chicago & North Western, for example, handled 249,996 tons of coal in average carloads of 40.6 tons in April, 1916, while in the same month of 1917 it handled 566,728 tons, with an average load per car of 43.3 tons. The increase in the amount of coal handled was approximately 100 per cent, and the increase in the average carload 9 per cent.

Railroads in general are and have been storing coal, although this practice increases the cost of coal on the locomotive practically 55 cents per ton—15 cents for unloading, 15 for loading and a deterioration of 25 cents a ton. In the case of the Chicago & North Western 800,000 tons are being stored at an estimated cost of \$400,000. The railroads are undergoing this sacrifice in order to make gondola cars available for commercial business next winter. The result has been accomplished by the carriers in the face of a very large increase in regular commercial traffic, in military traffic, and in special movements of material of all kinds for the building of ships, and for the construction of cantonment camps. In addition there has been a complete change in the natural flow of coal traffic. In ordinary years 31,500,000 tons of coal are shipped by lake from Ohio and West Virginia to the Northwest. This year a shortage of vessel tonnage will result in a decrease of from 10 to 15 million tons in the receipts from those fields, which has necessitated the movement of additional coal by rail from Illinois, Indiana and Kentucky fields.

MEETINGS AND CONVENTIONS

The following gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the 100 issue of the Railway Age Gazette for each month.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hone, C. R. & R. of N. I., 143 Liberty St., New York. Next meeting, October 16-17, St. Louis.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 16-18, 1917, Chicago.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—E. R. Woodson, Rooms 1116-8 Woodward Bldg., Washington, D. C. Next meeting, September 26, Congress Hotel, Chicago.

ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Semi-annual meeting with Master Car Builders' Association.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—Willis H. Failing, Terminal Station, Central of New Jersey, Jersey City, N. J.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal). One. Regular meetings, 3d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—W. L. Connelly, Supt. of Telegraph, Indiana Harbor Belt, Gibson, Ind. Next annual meeting to have been held September 18, 1917, Washington, D. C., indefinitely postponed.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—W. R. McMunn, New York Central, Albany, N. Y. Next convention, September, 1917, St. Louis.

CINCINNATI RAILWAY CLUB.—H. Boniet, Chief Interchange Inspector, Cin'ti Ry., 101 Carey Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 568 Union Arcade Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Huhner, 321 Grand Central Bldg., Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

INVESTMENT BANKERS' ASSOCIATION OF AMERICA.—Frederick R. Fenton, 11 W. Monroe St., Chicago. Annual convention, October 1-3, 1917, Baltimore, Md.

MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 16-18, 1917, Cleveland, Ohio.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—A. P. Dane, B. & M., Reading, Mass. Next annual meeting, September 11, Chicago.

NATIONAL ASSOCIATION OF RAILWAY COMMISSIONERS.—Jas. P. Walker, 120 Broadway, New York City. Next annual convention, October 16, 1917, Washington, D. C.

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

NEW YORK RAILROAD CLUB.—Henry D. Vought, 95 Liberty St., New York. Regular meetings, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Geo. A. J. Hochgrebe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PACIFIC RAILWAY CLUB.—W. S. Vollner, Assistant to Chief Engineer, Northwestern Pac., P. O. Box 1, San Francisco, Cal.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial Annex Hotel, Pittsburgh.

RAILWAY FIRE PROTECTION ASSOCIATION.—C. R. Edwards, office of the president's assistant, Seaboard Air Line, Norfolk, Va. Next meeting, October 2-4, 1917, St. Louis, Mo.

RAILWAY REAL ESTATE ASSOCIATION.—R. H. Morrison, Assistant Engineer, C. & O., Richmond, Va. Next convention, October, 1917, Duluth, Minn.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next annual convention, September 18-19, 1917, Hotel Traymore, Atlantic City, N. J.

RICHMOND RAILROAD CLUB.—P. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September 18-21, 1917, Hotel Auditorium, Chicago, Ill.

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

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, December, m., Piedmont Hotel, Atlanta.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

TRAFFIC CLUB OF PITTSBURGH.—J. L. Wells, Gen'l Apt., Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings bi-monthly, Pittsburgh.

UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—W. V. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

Traffic News

The summer meeting of the National Industrial Traffic League was held at the Hotel Statler, Buffalo, N. Y., on August 23 and 24.

The National Shippers Conference will meet at Chicago, August 31, to consider what action to take if the railroads again ask for a rate increase.

The freight traffic department of the Baltimore & Ohio is working out a plan for "sailing days" for l. c. l. freight similar to the methods recently adopted by the Pennsylvania and the Pere Marquette.

The Railroad Commission of Louisiana will hold a hearing at Baton Rouge on September 5 to consider the application of the railroads of the state for an advance of 15 cents a ton on intrastate coal and coke rates.

The Southern Pacific has filed application with the Railway Commission of California for permission to increase one-way and monthly commutation fares on suburban passenger trains between San Francisco, Cal., and Alameda county points.

The dining car department of the Rock Island Lines announces the inauguration of tray service in passenger coaches. Under the arrangement a waiter will pass through the cars during meal hours with coffee, sandwiches, doughnuts and hard boiled eggs for sale to passengers at prices ranging from 5 to 10 cents each.

Illinois railroads on August 17 petitioned the State Public Utilities Commission of Illinois for a reduction in the free time to be permitted for the unloading and loading of open top cars from 48 hours to 24 hours. They also asked the abolition of the 24 hours' free time permitted in connection with the re-consignment of open top cars. The railroads took the action upon the recommendation of the State Council of Defense.

R. J. Clancy, assistant to the general manager of the Southern Pacific at San Francisco, recently issued a statement illustrating the inexpensiveness of transportation service. It costs more, he said, to send a letter through the mails from New York to San Francisco than to ship a \$5 hat the same distance by freight. Shoes are loaded into a car and hauled 3,000 miles to the Pacific Coast for one-third the cost of a shave. A pound of live beef from Nevada is hauled more than 300 miles to San Francisco over a mountain range a mile and one-half high for about a third of a cent. A 15 per cent increase in freight rates applied to the shipment of a \$35 suit of clothes, a \$5 hat, an \$8 pair of shoes, 30 dozen eggs and 7 pounds of live beef, from New York, Petaluma, Cal., and Wabaska, Nev., respectively, to San Francisco would amount to less than 5 cents.

Caution as to Shipper's Order on Grain, Hay and Feed

Shippers of grain, hay and feed have been advised by the Bureau of Markets, United States Department of Agriculture, to be on the lookout for what is known as "shipper's order bill of lading" transactions with unknown or irresponsible persons. Shipping carlots to such buyers under no obligation other than to pay for the shipment if they finally take it out of the cars tends to encourage speculation and is liable to increase freight congestion. Some of these buyers order products shipped in the hope that the price will go up in the meantime and enable them to sell locally to a local dealer who will pay cash. Unless they succeed in selling to others, many of these "shipper's order" consignees have insufficient capital to pay for the goods which sometimes fall back on the shipper.

In a case recently investigated by the department a man without financial standing, who posed as a commercial company, succeeded in purchasing large shipments of hay and mill feed. As there was no advance in price, and as he had no cash with which to meet the drafts, he held the goods for several weeks in the cars on the track. Some of the cars were on the track for over 20 days before unloading. When he succeeded in

selling a car, instead of paying his own cash for it, he sent his customer to the bank to release the draft. The day the department investigator was on the ground this man had 13 cars of hay and 9 cars of mill feed on the track, papers for 17 more cars en route, and a number more still to be shipped. It was stated locally that in the same kind of transaction in the past a severe decline in price rendered this individual unable to pay for 30 cars of produce, which the shipper was forced to sell at a material loss.

"94,839 Pounds of Catalogues in One Car"

Putting 94,839 pounds of catalogues into one box car is the way a New York shipper and officials of a railroad it used answered in concrete fashion the plea of the Railroads' War Board to make one freight car do the work of two.

The books—bulky affairs—made 16 truck-loads when they were carted to the Lehigh Valley Pier 34. They were catalogues of the National Cloak & Suit Company bound for a western distributing point, and ordinarily would have required two box cars.

The traffic manager decided it was possible to get them all into one car and secured that result through the co-operation of the Lehigh Valley.

Keeping Tab on Live Stock Shipments

On August 16 there were 3,115 carloads of live stock on the railroads of the United States destined to some 100 markets. Of these cars, 1,772 were loaded with cattle, 699 with hogs, 289 with sheep, 105 with horses and mules, and the rest with mixed stock. The greatest number of cars for any point were bound to Chicago, with Kansas City second, Fort Worth third, and St. Paul fourth.

These are the figures that are being compiled daily by the Bureau of Markets of the United States Department of Agriculture with the co-operation of 521 division superintendents of all railroads west of the Allegheny mountains, representing about 225,000 miles of line who nightly report these facts by telegraph. The Bureau receives nightly an average of 300 such wires from division superintendents. A night force of telegraph operators and statistical clerks receives and tabulates this information, so that it can be wired to market points at 7 a. m., eastern time.

A tabulated summary of the loadings is wired daily, including Sunday, to the local offices of the Bureau of Markets in Boston, New York, Philadelphia, Chicago, Kansas City, Omaha; Portland, Ore.; Fort Worth, Tex., and Washington, D. C., for immediate publication in the press. Thus producers of live stock and members of the live stock and meat trade at the markets have an early morning report, which will assist in gauging more accurately the receipts at all of the live stock markets. The information contained in these reports, those issuing them say, will help to avoid the present costly market glut, and should decrease the need for the divisions of live stock in transit.

INCREASED FREIGHT AND PASSENGER RATES IN RUSSIA.—The consulate general at Moscow, Russia, has reported under date of June 25 that the Provisional government has decided to increase passenger tariffs on the railroads 50 per cent, and freight tariffs 200 per cent.

INCREASED FREIGHT IN URUGUAY.—A decree of June 21, 1917, by which the Uruguayan government authorizes the Central Uruguay Railway Company to collect a special surcharge, has settled for the present a controversy of several months with respect to railway rates.

ELECTRIC MOTORS FOR RAILWAY IN PERU.—Sr. Benjamin La Torre, of Cuzco, Peru, has informed Commercial Attaché William F. Montavon, at Lima, that he desires to obtain information with regard to electric locomotives from the United States for possible use on the Cuzco-Santa Ana Railway, an extension out of Cuzco of the Southern Railway of Peru. He is interested in both the construction and operation of the road. Although it will open up a region of some importance, he expects light traffic at first, and suggests the possibility of using locomotives running on storage batteries.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The commission has suspended from August 20 until December 18 proposed increases in carload rates on wheat from Omaha and Kansas City to Jackson and Meridian, Miss.

The Interstate Commerce Commission has suspended from August 20 until December 18 the operation of a proposed increased charge via express companies, exclusive of Wells, Fargo & Co., for the transportation of empty fish cars in express service. The present charge is 10 cents per mile per car, and the charge proposed is 25 cents.

COURT NEWS

Off-the-Line Telegraph and Railroad Service

In a suit brought by the Postal Telegraph-Cable Company against the Chicago Great Western, Judge Evan Evans in the United States District Court at Chicago sustained the order of the Interstate Commerce Commission, declaring invalid contracts between railroads and telegraph companies by which free off-the-line service is given on both sides. In conformance with this decision the telegraph company must pay for its off-the-line railroad service, and the railroad company for its telegraph service off its lines, notwithstanding any contracts. The holding is in direct conflict with the decision of Judge Mayer in the United States District Court in New York in a suit brought by the Baltimore & Ohio against the Western Union Telegraph Company, which was later sustained by the United States Court of Appeals of the Second Circuit.

Injuries to Passenger by Others

A passenger sued a railroad for injuries received by her when, as she reached the center of a car platform in boarding the train, she was thrown against the brake wheel by a man emerging from the car. It did not appear that the car was crowded or that there was any commotion or disturbance. The Massachusetts Supreme Judicial Court held the railroad not liable, under the rule that a common carrier is not responsible for injuries to a passenger caused by the misconduct of others, which it could not have foreseen or guarded against.—*Eaton v. N. Y. N. H. & H. (Mass.)*, 116 New England, 815. Decided May 26, 1917.

Objection to Railroad Reorganization

The Circuit Court of Appeals, Fifth Circuit, holds that where the owners of 80 per cent of the bonds secured by a railroad mortgage had joined in a plan of reorganization, and it was still open to an objecting bondholder, who was acting purely in his own interests, and not for other minority bondholders, to join in such plan, a confirmation of a sale to a reorganization committee would not be denied, and a resale ordered merely for the purpose of coercing the committee, by repeated orders of resale, to pay such bondholders the par value of the bonds.—*Simon v. New Orleans, Texas & Mexico*, 242 Fed., 62. Decided April 28, 1917.

Construction of Safety Appliance Act

The Federal district court for the Eastern District of Kentucky holds that the Safety Appliance Act, sect. 4, which provides that a car properly equipped, which has become defective or insecure while in use, "may be hauled from the place where such equipment was first discovered to be defective or insecure to the nearest available point where such car can be repaired," without liability for the penalties imposed, does not permit a railroad company to move, without penalty, from one point to another, a defective car, not known to be defective, and which is not so moved for the purpose of repair, although in fact it

is hauled to the nearest available point for repair, and is there repaired.—*United States v. Chesapeake & Ohio*, 242 Fed., 161. Decided October 14, 1916.

Conflicting Freight Rates

The Interstate Commerce Commission prescribed maximum rates between Shreveport, La., and points in Texas, prohibited the charging of rates between such points higher than those applied for like distances between points in Texas, and ordered the railroad companies to cease applying the classification provisions then maintained to transportation between points in Texas. A compliance with this order by the railroad companies would subject them to a multiplicity of suits by the State Railroad Commission, and by shippers for failure to comply with the rates prescribed by the State Railroad Commission, while non-compliance therewith would also subject them to a multiplicity of suits with liability to large penalties. The Federal district court for the Western District of Texas holds that the companies are entitled to a temporary injunction restraining the State Railroad Commission and shippers who are threatening suit from instituting any suits pending an action for a permanent injunction based on the failure of the railroad companies to comply with the state rates so far as in conflict with the rates prescribed by the Interstate Commerce Commission.—*Eastern Texas v. Railroad Commission*, 242 Fed., 300. Decided April 20, 1917.

No Authority to Prescribe Unremunerative Rates

The district court for the Western District of Missouri holds that, assuming that Missouri Public Service Commission Law, sect. 35, providing that nothing therein, or in any other law, shall limit the power of the commission to order the sale of and prescribe reasonable and just maximum fares for commutation tickets, authorizes the commission to order the sale of suburban commutation tickets, and to prescribe rates therefor, where a carrier's earnings fall short of a fair return to any extent, the commission cannot prescribe commutation rates which will still further reduce such earnings, even though to a comparatively negligible extent, and such action is not authorized by reason of local public demand or interest, or by the commission's views of the possible beneficial effects of such rates on the company's business.—*Kansas City, C. C. & St. J. v. Barker*, 242 Fed., 310. Decided May 27, 1917.

Hours of Service Act—Available Excuses

The Circuit Court of Appeals, Sixth Circuit, holds that, under section 3 of the Hours of Service Act, where there is a delay from unavoidable accident, or a cause not known to the railroad's agents when a freight train leaves its terminal, and which could not have been foreseen, the railroad is entitled to add to the 16 hours permitted by statute all the delay, no more and no less, which thereafter occurred as the result of this cause, provided the following conditions existed: (a) That from the beginning of the trip, and even before it became apparent, or should have become apparent, to the train dispatcher that there was danger of not finishing the trip within the time, the railroad used reasonable diligence to avoid delays; (b) that as soon as it became apparent, or should have become apparent, that there was any danger of not getting through on time, the railroad used a very high degree of effort or extreme diligence to get the train through to the end of the run within the time limit; (c) that as soon as it became fairly probable that excess service would otherwise be necessary, the railroad used that same high diligence to prevent excess service either by laying up the train or by sending relief, or in any other practicable way; (d) that continually and until the service ended, the railroad used the same high diligence and by the same means, to the end that the excess service, if any, should be as short as possible.—*B. & O. v. United States*, 242 Fed., 1. Decided May 8, 1917.

BRITISH INVENTIONS DURING THE WAR.—During the year 1916, the report of the British comptroller general of patents states, applications were filed for 18,602 new patents. The number of applications during the preceding year was 18,191.

Equipment and Supplies

FREIGHT CARS

THE CHICAGO & ALTON has ordered 200 gondola car bodies from the Haskell & Barker Car Company.

THE SEMET-SOLVAY COMPANY, SYRACUSE, N. Y., has ordered 100 hopper cars from the Haskell & Barker Car Company.

THE UNITED STATES GOVERNMENT has increased its orders for standard gage cars for service in France from 6,000 to 9,000, each individual order having been increased 50 per cent. This now makes a total of 9,000 standard gage cars, and 2,997 narrow gage cars. There remain orders for 5,000 more cars to be placed.

MISCELLANEOUS

THE TEXAS & PACIFIC has awarded a contract to the Roberts & Schaefer Company, Chicago, for a 400-ton, 2 track coaling plant, for erection at Mingus, Tex.

THE ELGIN, JOLIET & EASTERN has awarded a contract to the Roberts & Schaefer Company, Chicago, for a 150-ton reinforced concrete, 2-track automatic electric coaling plant for installation at South Gate, Illinois Steel Works, Joliet, Ill.

THE OREGON SHORT LINE has awarded a contract to the Roberts & Schaefer Company, Chicago, for two 150-ton reinforced concrete, 3-track automatic electric coaling plants and sanding plants, for installation on its lines at Dillon and Melrose, Mont.

THE CHICAGO SHORT LINE has awarded a contract to the Roberts & Schaefer Company, Chicago, for a 100-ton coaling plant, equipped with a Duplex shallow pit loader and a "Rand S" measuring coal loader, for issuing and recording all coal passed to locomotives.

THE PENNSYLVANIA LINES WEST OF PITTSBURGH has awarded a contract to the Roberts & Schaefer Company, Chicago, for a 500-ton, 3-track reinforced concrete and steel counterbalanced bucket coaling plant of the automatic type, for installation at the New Harthorne Yards, Indianapolis, Ind.

THE MONONGAHELA RAILROAD has awarded a contract to the Roberts & Schaefer Company, Chicago, for the building of a combined 200-ton concrete, 3-track coaling plant, electric cinder handling plant, and a "Rand S" gravity and sand plant, all of concrete construction, to be erected immediately at Brownsville, Pa.

THE FIRST SUBMARINE.—The first submarine boat of which history makes any record was built by a Dutchman, named van Driemel, in 1640. The boat was built in England with money said to have been advanced by King James I. According to reports the vessel had a unique ballasting system. There was a number of goatskin bags placed under the deck between two large planks. These bags, when filled with water, caused the vessel to sink. To cause it to rise again the bags were pressed together again with a windless arrangement, forcing the water out, and thus giving the boat reserve buoyancy.—*The Engineer*.

ELECTRIC SOLDERING IRON.—A new type of soldering iron consists essentially of two high-resistance heating points, or electrodes, that become incandescent when the current passes through them. As the circuit is closed as soon as the points come into contact with the metal to be heated, the iron is said to become heated to the required degree the moment it touches the work. Besides, the heat is generated at the point of contact and at the spot where the heat is needed when soldering, brazing, or annealing. The iron operates at from six to sixteen volts and the points are made to carry current according to ratings of 150, 250 and 500 watts.—*Machinery*.

Supply Trade News

Howard C. Mull, sales representative of the Verona Tool Works in the Chicago office, has been appointed sales agent in charge of the Chicago territory.

R. G. Taylor, sales representative for the American Car & Foundry Company, has been commissioned captain of ordnance in the Officers' Reserve Corps, and has been assigned to duty at Rock Island, Ill.

Thomas H. Garland, president of the Garland Ventilation Company, Chicago, and inventor of the Garland car ventilator, died in Chicago August 20, following a protracted illness. Mr. Garland was 56 years old.

William L. Allison, vice-president of the American Arch Company, Chicago, who has been in training at the officers' training camp at Ft. Sheridan, Ill., has been commissioned a major in the Officers' Reserve Corps.

Arthur S. Lewis has resigned his position with the Chicago-Cleveland Car Roofing Company to join the sales force of Flint & Chester, Inc., New York, effective September 1. Mr. Lewis as assistant to the president will have charge of sales to railroads and other large corporations. He succeeds W. B. Wise, resigned to go into other business.

Adrian D. Joyce, general manager sales and distribution of the Sherwin-Williams Company, has been appointed by the Federal War Industries Board to membership on a special committee for the standardization of paints and varnishes in connection with war purchases. On the committee with Mr. Joyce are six other prominent paint manufacturers of the country.

TRADE PUBLICATIONS

BRINELL HARDNESS TESTING MACHINE.—The Scientific Materials Company, Pittsburgh, has issued a 12-page pamphlet discussing the hardness testing of materials with special reference to the advantage of measuring the depth of the indentation made by the testing ball rather than its diameter. A description is given of the improved American model of the Brinell machine, with the appliances for measuring the depth of the penetration as well as other apparatus used in testing of this kind. The pamphlet also contains tables of hardness values.

COST OF COAL ON SWISS RAILWAYS.—The quantity of coal used yearly by the Swiss Federal railways is as follows: In 1915, 636,298 short tons, or 33 pounds per kilometer of 0.621 mile; in 1916, 652,884 tons, or 34 pounds per kilometer. The average price per ton paid for coal by the Swiss Federal Railways during the past 5 years was as follows: In 1912, \$5.27 per ton of 2,204 pounds; in 1913, \$5.22; in 1914, \$5.17; in 1915, \$5.15; in 1916, \$6.17.

FREIGHT CONGESTION WORRIES JAPAN.—At the end of 1916 the total amount of freight at the Japanese government railway stations was returned at 285,420 tons, but since then the accumulation has continued, and on June 10, 1917, the total reached 463,130 tons. Lately the number of applications to the railway authorities for forwarding goods has greatly increased as the raw silk season and the time for the planting of rice shoots are approaching. The Japanese Railway Board is said to be endeavoring to devise means of meeting the requirements of the situation, though this is not easy, considering that the maximum transportation capacity of the government railways is not much more than 130,000 tons a month. Mr. Hasegawa, superintending engineer of the Railway Board, referring to this matter, remarks that the chief cause of the enormous increase in railway freight must be attributed to the scarcity of hold space and the consequent rise in freight, much of which has hitherto been carried on ships being now collected on the railways. The railway authorities are doing their best to build trucks and engines, so as to increase the transport capacity, but on account of the short supply of iron and other materials the building of equipment does not proceed as quickly as desired.—*N. Y. Tribune.*

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—Plans have been completed by this company for the building of a second track between Floyd, Mo., and Camden, a distance of approximately 5 miles; between Braddock, Kan., and Walton, a distance of 6 miles; from Goff, Cal., to Bagdad, a distance of 30 miles, and from Glorieta, N. M., to Fox, a distance of about 4 miles. Work has already been started on the new track in California.

CHICAGO, ROCK ISLAND & PACIFIC.—This company has prepared preliminary plans for the construction of a subway under its tracks at Moline, Ill.

GRAND TRUNK.—A contract has been awarded by this company to James Stewart & Co., New York, for the construction of a car repair shop at Port Huron, Mich. The building will be 22 ft. high, 77 ft. wide and 300 ft. long, with brick walls, concrete foundation, and a tar and gravel roof.

KIRBY-BONNER LUMBER COMPANY.—Plans have been completed by this company for the construction of a road from Newton, Tex., to a point 24 miles northeast. The contract for the work will probably be let within the next 10 days, and construction will be started as soon as possible.

LEHIGH & NEW ENGLAND.—A contract has been given to F. H. Clement & Co., Philadelphia, Pa., to build a line from Bethlehem, Pa., 4.82 miles, in a generally westerly direction to Allentown and East Allentown, with an intermediate terminal at Rittersville, and a spur from Rittersville 0.61 miles long. The line is to be built through a rolling country, the approximate cut per mile will be 36,000 cu. yd., approximate fill 47,000 cu. yd., the maximum grade will be 1.5 per cent, and the maximum curvature 10 degrees. There will be 5 reinforced concrete bridges at highway crossings. The line is being built to carry coal and general merchandise.

MISSOURI, KANSAS & TEXAS.—This company has awarded a contract to the L. J. Smith Construction Company, Kansas City, Mo., for grading in connection with the extension of yards at Parsons, Kan. The work will involve the moving of approximately 275,000 cu. yd. of dirt.

PACIFIC ELECTRIC.—This company has been granted a franchise to extend its line from Santa Ana, Cal., to Tustin, a distance of approximately 6 miles. Work on the extension will be started in the near future.

PENNSYLVANIA LINES WEST. This company is building a new north-and-southbound yard at Orrville, Ohio, which involves the laying of about 30,000 yd. of track.

PHILADELPHIA & READING.—A contract has been awarded to C. P. Bower, Reading, Pa., for grading at Saucon Creek, south of South Bethlehem, Pa., for an extension to a freight yard north of Saucon Creek, providing for 385 more cars, and for a new yard south of Saucon Creek, with a capacity of 850 cars. The road will also build an engine house providing for six engines at the present time, but planned to ultimately take care of 29, and will construct a coaling station, water station and ash pit.

SAND SPRINGS.—This company has completed plans for the construction of a one-story brick car barn at Sand Springs, Okla. Work will be started on the structure in about two weeks, and will cost approximately \$10,000.

YAZOO & MISSISSIPPI VALLEY.—A contract has been awarded by this road to the George B. Swift Company, Chicago, for the construction of a passenger station and power house at Greenwood, Miss. The station will be one story high, 42 ft. wide and 161 ft. long, of brick construction, with concrete foundation and slate and composition roof. The power house will be 20 by 54 ft., and will also be of brick construction. The improvements necessitate the removal and remodeling of the freight house, which will be done by the company's forces.

Railway Financial News

CANADIAN NORTHERN.—This company has sold to Wm. A. Read & Co., \$10,000,000 one-year 6 per cent notes, which are being offered at 99.05, or on a 7 per cent basis. These notes are secured by \$15,333,000 Canadian Northern general mortgage 4 per cent bonds, guaranteed principal and interest by the Dominion of Canada. The notes are convertible into the bonds at 79.

DENVER & SALT LAKE.—Judge Class in the District Court at Brighton, Colo., has placed this company, which operates 255 miles of line between Denver, Colo., and Craig, in the hands of receivers. Charles Boettcher, president of the company, and William R. Freeman, tax agent for the Atchison, Topeka & Santa Fe, have been appointed receivers.

NEW YORK CENTRAL.—The New York Public Service Commission has authorized this company to guarantee \$1,000,000 25-year 5 per cent bonds to be issued by the Boston & Albany. The bonds are to be disposed of at par.

NEW YORK, NEW HAVEN & HARTFORD.—Marcus P. Knowlton and the other trustees appointed under the dissolution decree of October 17, 1914, in the government's Sherman law suit against the New Haven and other defendants, have petitioned the Federal District Court for a further extension of time in which to dispose of the aggregation of stock which they hold and control as a result of the litigation. They hold among other securities a block of 219,198 shares of stock of the Boston & Maine. The dissolution decree directed the trustees to dispose of the stock at private sale or public auction prior to January 1, 1918. Asking for the extension of the time of sale to January 1, 1920, the trustees in the position state that from the time of their appointment to the present time the financial situation of the Boston & Maine has been such as to make it impossible for them to sell the large block of stock without an enormous and unreasonable sacrifice. The other stocks in their possession, the trustees explain, are mainly those of railroads leased or operated by the Boston & Maine, and their market value is seriously affected by the same conditions which affect the stock of that road.

ST. LOUIS-SAN FRANCISCO.—J. W. Kendrick and Frederick H. Ecker have been elected directors, the stockholders having voted to increase the board from 15 to 17, and the executive committee from 7 to 9. Jesse Hirschman has been elected a director to succeed James Speyer, resigned. Mr. Kendrick and Mr. Hirschman have also been elected members of the executive committee. The directors have declared six months' interest (3 per cent) on the adjustment bonds and one year's interest (6 per cent) on the income mortgage bonds, payable October 1.

Authority has been obtained from the Missouri Public Service Commission to issue \$6,440,000 of 5 per cent prior lien bonds. The application states that \$4,578,900 will be used to reimburse the company for expenditures in acquiring property and improving the system, and \$1,862,000 for refunding obligations secured by lien.

INCREASED TRAVEL AT BOSTON TERMINALS.—In June the New Haven and the Boston & Albany handled 3,114,280 passengers in and out of the South Station, against 2,977,151 for the corresponding month last year. This represents an increase of 137,129, or 4.6 per cent. In the same month the Boston & Maine carried 2,320,828 passengers in and out of the North Station, against 2,246,086 last year, an increase of 74,742, or 3.3 per cent. In the six months ended June 30 the travel in and out of the big South terminal aggregated 19,171,063 passengers, against 18,074,601 for the corresponding period last year, an increase of 1,096,462, or 6 per cent. In and out of the North Station the travel was 14,193,405 passengers, against 13,351,703, an increase of 841,702, or 6.3 per cent. The South Station is the busiest in the country. The North Station is second and the busiest used by only one road.

Railway Officers

Executive, Financial, Legal and Accounting

Elisha Lee, general manager of the Pennsylvania, has been made acting vice-president in charge of operation during a leave of absence, which has been granted W. W. Atterbury. See also note in General News.

J. Tancy Willcox, assistant secretary of the Pennsylvania Railroad, and of 36 subsidiary corporations of the Pennsylvania System, will attend the officers' training camp, at Fort Oglethorpe, Ga., where he will report for duty on Wednesday, August 22. To fill the resulting vacancy, Harry T. Wilkins, who is at present special agent in the traffic department, and who managed the Pennsylvania Railroad's exhibit at the Panama-Pacific Exposition, has been appointed assistant secretary, effective August 20.

The officers of the Savannah & Atlanta, which has acquired all properties and franchises of the Savannah & Northwestern, are as follows: James Imbrie, chairman of the board, New York; Frank S. Gannon, president, New York; John H. Hunter, vice-president, Savannah, Ga.; C. E. Gay, Jr., vice-president and general manager, Savannah; Robert M. Hitch, secretary, Savannah; Ralph N. Scheffey, assistant secretary, New York; Thomas P. Goodbody, treasurer, Savannah, Ga.; J. E. Grainger, auditor; Hitch & Denmark, general counsel; Wilson Runnette, general freight agent, and J. S. Douglas, superintendent, with headquarters at Savannah.

Edgar S. McPherson, who has been elected vice-president of the Spokane International, with headquarters at Spokane, Wash., was born at Racine, Wis., on October 7, 1881, and entered railway service with the Wisconsin Central as an office boy on June 1, 1898. He was later promoted to secretary to the general superintendent of the same road, and on August 1, 1901, became chief clerk to the general superintendent. On January 15, 1902, he was promoted to secretary to the president, and on June 1, 1909, became associated with the Minneapolis, St. Paul & Sault Ste. Marie in a similar capacity. On February 1, 1910, he was appointed chief clerk to the general manager, and on June 1 of the same year became chief clerk to the president. On January 1, 1916, he was promoted to assistant secretary, and on May 1, 1917, he became assistant to the president of the Spokane International, which position he held until his election as vice-president.

Operating

James Berlingett, general manager of the Virginian Railway, has resigned from that position.

C. J. Adair has been appointed terminal trainmaster on the Chicago & Alton, with headquarters at Chicago.

T. S. Fox has been appointed trainmaster on the Grand Rapids & Indiana, with headquarters at Ft. Wayne, Ind., succeeding R. E. Casey, promoted.

George W. DeGraff, yardmaster of the Central of New Jersey at Cartaret, N. J., has been appointed assistant trainmaster, with headquarters at Jersey City.

J. P. Taylor has been appointed general agent of the Atlantic Coast Line, the Seaboard Air Line and the Southern Railway at Camp Jackson, near Columbia, S. C.

T. J. Hayden, yardmaster of the Southern Railway at Asheville, N. C., has been appointed trainmaster, with headquarters at Asheville, vice C. G. King, assigned to other duties.

John Goodfellow has been appointed trainmaster of the Los Angeles division of the Southern Pacific, with headquarters at Los Angeles, Cal., succeeding J. C. Muir, resigned, effective August 10.

J. P. Connolly, supervisor of mail traffic of the Philadelphia & Reading at Jersey City, N. J., has been appointed supervisor of mail and express traffic, with office at Reading Terminal, Philadelphia, Pa.

O. S. Johnson, chief clerk to the president and general manager of the Minneapolis & St. Louis at Minneapolis, Minn., has been appointed assistant to the general manager, with the same headquarters.

Joseph H. Gumbes, whose appointment as general superintendent of the Western Pennsylvania division of the Pennsylvania Railroad is announced elsewhere in these columns, was

born at Oaks Station, Montgomery county, Pa., November 27, 1866. He graduated from the engineering department of the University of Pennsylvania in 1888, and entered railway service as a rodman on the Middle division. In December, 1890, he was transferred to the maintenance of way department at Altoona, and on August 11, 1891, promoted to assistant supervisor at Freeport, Pa. He was transferred to a similar position at Mifflin, Pa., on the middle division, on April 30, 1893. On July 1, 1897, he was promoted to supervisor

at Millersburg, Pa. On October 30, 1899, he was transferred to the Monongahela division as supervisor at Dravosburg, and on January 1, 1900, he returned to Mifflin as supervisor. On December 10, 1901, he was transferred to the position of supervisor at New Florence, Pa., on the Pittsburgh division, and on June 1, 1903, was promoted to division engineer of the Monongahela division. On April 1, 1905, he was transferred to division engineer of the West Jersey & Seashore, and on April 1, 1907, to division engineer of the Pittsburgh division. He was promoted to assistant superintendent of the Pittsburgh division on March 3, 1911, and on December 1, 1913, he was made superintendent of the Renovo division, with headquarters at Renovo, Pa. He was promoted to superintendent of the Philadelphia Terminal division on May 1, 1916.

Arthur B. Clark, whose appointment as superintendent of the Philadelphia Terminal division of the Pennsylvania Railroad is announced elsewhere in these columns, was born at Green Village, Pa., October 1, 1867. He graduated from Lafayette College in 1891, receiving the degree of civil engineer. During his summer vacations in 1889 and 1890 he was employed on the Pennsylvania Railroad as rodman, first entering the service July 1, 1889. After graduation he was employed from September 14, 1891, as rodman on the Philadelphia division at Philadelphia. On July 2, 1896, he was promoted to assistant supervisor, and served in that position on the Altoona and Pittsburgh divisions. On July 1, 1900, he was promoted

to the position of supervisor on the Baltimore division of the Northern Central. On July 20, 1901, he was transferred to the Pittsburgh division and located at Pittsburgh, in charge of the track work of the Pittsburgh Yard, in connection with the construction of the new Pennsylvania station. On December 15, 1905, he was promoted to assistant engineer of the Middle and Western divisions of the Philadelphia & Erie. He was subsequently transferred to the same position on the West

Jersey & Seashore, thence to the Maryland division of the Philadelphia, Baltimore & Washington, as assistant engineer. On January 15, 1910, he was promoted to principal assistant engineer of the Philadelphia, Baltimore & Washington, and on June 16, 1913, he was made assistant engineer maintenance of way, in charge of roadway and track. On September 28, 1916, Mr. Clark was promoted to the position of superintendent of the Renovo division.

W. R. Parsons, trainmaster of the Atlanta, Birmingham & Atlantic at Fitzgerald, Ga., has been appointed superintendent of the Birmingham division, with headquarters at Manchester, Ga., vice F. M. Wooddall, resigned.

J. P. Kavanaugh, terminal trainmaster of the Baltimore & Ohio at Philadelphia, Pa., has been promoted to assistant superintendent in charge of the Baltimore (Md.) terminals, succeeding R. A. Grammes, who was recently given a commission as major in the army; W. H. Lynn, general yardmaster at Cumberland, succeeds Mr. Kavanaugh.

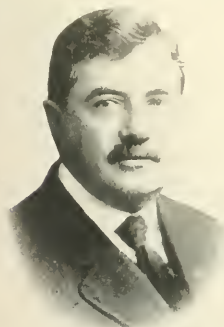
Richard L. O'Donnel, whose appointment as assistant general manager of the Pennsylvania Lines East of Pittsburgh is announced elsewhere in these columns, was born in Philadelphia,

November 5, 1860. He graduated from the Philadelphia high school in 1877, and from the Polytechnic College of Pennsylvania in 1882. He entered the service of the Pennsylvania Railroad in 1883, and was employed as rodman, levelman and transitman in the construction department until 1884; as draftsman at Blairsville in the assistant engineer's office of the West Penn division during 1884, 1885 and 1886. In November, 1886, he became assistant engineer in the principal assistant engineer's office at Altoona. He was

appointed assistant supervisor at Hollidaysburg in March, 1887, and was transferred in February, 1888, to the same position at Lancaster on the Philadelphia division. Following the flood at Johnstown, May 31, 1889, Mr. O'Donnel was assigned to temporary duty at that point in charge of a force of men. After six weeks' service at Johnstown he was transferred to the Pittsburgh division as assistant supervisor at New Florence. He was promoted in November, 1889, to supervisor in the Altoona yard, and in April, 1891, became assistant engineer of the Tyrone division. He was transferred to the Pittsburgh division as assistant engineer in December, 1894. In February, 1897, Mr. O'Donnel was promoted to assistant superintendent of the Pittsburgh division, and to superintendent of the same division on January 1, 1902. He was appointed general superintendent of the Buffalo & Allegheny Valley division on January 1, 1903, and on March 3, 1911, general superintendent of the Western Pennsylvania division.

C. E. Green, trainmaster on the Chicago, Rock Island & Pacific at Des Moines, Iowa, has been transferred to Bureau, Ill., succeeding B. H. Hagelbarger, resigned to enter military service; C. W. Lafer, trainmaster at Omaha, Neb., has been transferred to Des Moines; H. C. Higgins has been appointed trainmaster of the West Iowa division, with headquarters at Omaha.

To complete the organization of the general manager's department of the Pennsylvania Railroad, Richard L. O'Donnel has been appointed assistant general manager of the Lines East of Pittsburgh and Erie. This position has been vacant since April 1. Mr. O'Donnel has been general superintendent of the Western Pennsylvania division, at Pittsburgh, for the past six years. As assistant general manager, he will be located in the general offices at Broad Street station, Philadelphia. J. H. Gumbes, super-



J. H. Gumbes



R. L. O'Donnel



A. B. Clark

intendent of the Philadelphia Terminal division, has been appointed general superintendent of the Western Pennsylvania division, to succeed Mr. O'Donnel. A. B. Clark, superintendent of the Kenova division, will become superintendent of the Philadelphia Terminal division. He will be succeeded by E. B. John, superintendent of the Delaware division, and P. L. Grove, master mechanic of the West Philadelphia shops, will become superintendent of the Delaware division.

Traffic

Hugh Miller has been appointed commercial agent of the Delaware, Lackawanna & Western at New Haven, Conn., vice Robert H. Martin, resigned to engage in other business.

R. C. Wharton has been appointed general agent of the Georgia Railroad at Macon, Ga., vice W. E. Mobley, assigned to other duties. F. W. Boschert has been appointed commercial agent at Memphis, Tenn., succeeding Mr. Wharton.

N. H. Hall has been appointed commercial agent of the Gulf Coast Lines, with headquarters at San Francisco, Cal., succeeding C. F. Northrup, resigned; L. G. Wilson has been appointed commercial agent, with headquarters at Los Angeles.

F. H. Donahue, traveling passenger and freight agent of the Missouri Pacific at Milwaukee, Wis., has been appointed general agent of the passenger and freight departments, with the same headquarters, succeeding H. N. Atwood, transferred.

Sheldon A. Volkman, general agent on the Great Northern at St. Paul, Minn., has been appointed general agent, refrigerator service, succeeding O. W. Farrell, assigned to other duties; H. E. Kendree has been appointed general agent, with headquarters at St. Paul.

G. R. Piper, general agent of the Atchison, Topeka & Santa Fe at Atchison, Kan., has been appointed division freight agent at Wichita, succeeding E. E. Hook, resigned to enter other business; M. C. Burton, traveling freight agent, with headquarters at Hutchinson, has been promoted to general agent at Atchison.

B. Z. Ruff, commercial agent of the Southern Railway at Spartanburg, S. C., has been appointed commercial agent, with office at Savannah, Ga., succeeding G. S. Hinkins, who has accepted service with the American Railway Association, and C. J. Danehey, traveling freight agent at Columbus, S. C., has been appointed commercial agent at Spartanburg, vice Mr. Ruff.

C. A. Werlich, whose appointment as assistant general freight agent of the Minneapolis & St. Louis, with headquarters at Minneapolis, Minn., was announced in the *Railway Age Gazette* of August 10, entered railway service with the Iowa Central in 1888 as a clerk in the local freight office of Oskaloosa, Iowa. In 1890 he was promoted to the general auditing department at Marshalltown, and in 1892 became rate clerk in the general freight office, and later held various positions in that department, including that of chief tariff clerk, until January 1, 1905. On the latter date the general offices of the Iowa Central and the Minneapolis & St. Louis were consolidated at Minneapolis, and he was appointed chief clerk of both roads. On November 30, 1909, when the general freight offices of the Chicago & Alton, the Toledo, St. Louis & Western, the Minneapolis & St. Louis and the Iowa Central were consolidated at Chicago, he became chief clerk of the tariff department for all four roads. On December 15, 1910, he was promoted to chief clerk in the general freight office of the Minneapolis & St. Louis and the Iowa Central at Minneapolis, Minn., and on January 1, 1912, became chief of the tariff bureau of the Minneapolis & St. Louis, which position he held until his recent appointment, as already noted.

Engineering and Rolling Stock

W. F. Seemuth has been appointed signal inspector on the Chicago, Milwaukee & St. Paul, with headquarters at Milwaukee, Wis.

N. C. Van Natta, who has been appointed chief engineer of the Missouri, Oklahoma & Gulf, with headquarters at Muskogee, Okla., was born at Chicago, on May 8, 1868, and entered railway service with the Chicago, Burlington & Quincy in 1887. In 1909 he became associated with the Gallatin Valley as chief engineer, and in 1910 he went with the Chicago, Rock Island &

Pacific. In April, 1912, he became assistant engineer on the Chicago, Milwaukee & St. Paul. In the following year he went with the Chicago & Eastern Illinois in a similar capacity, and in 1916 he was promoted to locating engineer, and in 1917 he became valuation engineer for the Missouri, Oklahoma & Gulf, which position he held until his recent appointment as chief engineer.

Special

Frank A. O'Connell has been appointed editor of the Baltimore & Ohio Employees' Magazine at Baltimore, Md., succeeding R. M. Van Sant and A. W. Grahame, editor and associate editor respectively, who have entered military service.

Railway Officers in Military Service

R. M. Van Sant, editor of the Baltimore & Ohio Employees' Magazine, has been commissioned a lieutenant in the infantry branch at the Officers' Reserve Corps training camp, Fort Myer, Va., and A. W. Grahame, associate editor, will enter military service this month at the same camp.

Major R. Falshaw Morkill, formerly signal engineer of the Grand Trunk Railway System, and now serving overseas in the British Army, has been appointed by the director-general of transportation to take over all signaling work in the area occupied in France and Belgium by the British forces, and is now at general headquarters.

Colonel Charles D. Hine, formerly vice-president and general manager of the Southern Pacific of Mexico, and more recently special representative of the president of the Baltimore & Ohio, has been assigned to the command of the 165th Regiment, formerly the 69th of the New York National Guard. Colonel Hine is a graduate of West Point. He later entered railway service, but became a major of volunteers in the Spanish-American war.

OBITUARY

George S. Cheyney, general superintendent of water companies of the Pennsylvania Railroad since March, 1910, died suddenly on August 16, 1917, at his home in Cheyney, Pa., at the age of 54.

J. H. P. Hughart, president of the Grand Rapids & Indiana, who died at a Grand Rapids (Mich.) hospital on August 16 from injuries sustained from a fall, was born at Pittsburgh, Pa., on December 1, 1854, and entered railway service with the Pittsburgh & Connellsville on September 1, 1869. In 1874 he went with the Grand Rapids & Indiana, and served successively until January 1, 1892, as secretary to the president, purchasing agent, paymaster, secretary, assistant to the president and acting superintendent. On the latter date he was promoted to second vice-president and general manager, and on June 1, 1896, became general manager of the road when it was reorganized. On April 1, 1906, he was elected vice-president and general manager, and in April, 1914, became president.

MEXICO REDUCES RATES ON AMERICAN CORN.—The Mexican railways have reduced the freight rates throughout Mexico 30 per cent on American corn, according to a report from the American consul general at Mexico City.

GOOD TEAM WORK ON INADEQUATE RAILWAYS.—There had been serious strikes in Italy's railroad force only a few months before the declaration of war, and doubts could reasonably be entertained as to the efficiency of the railroad service, which, moreover, was said to be heavily sprinkled with anarchistic or socialistic theories, and disorganized on account of the recent disastrous earthquakes. But on the day when the army was mobilized, the nation showed what stuff she was really made of, and how the infection both of Germanism and of evil-minded socialism was only skin-deep. Military trains followed each other on the most congested and unmilitary tracks in the world, day and night for days and nights without a single casualty; the railroad force saw to it that everyone concerned did his duty. As a piece of team-work and organization in the face of technical odds (it is remarkable how the geography of Italy stands against her history at all times) it was unprecedented, and may be hard to beat.—*Amey A. Bernardy in the Boston Transcript.*

Railway Age Gazette

Volume 63

August 31, 1917

No. 9

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Many roads have an organized department for supervising the handling and performance of locomotives. Never before has a department of this kind had such an opportunity to show its worth. With the cost of fuel to the railroads as large as it now is no stone should be left unturned to have fuel used economically. It has been shown in the past that great results can be obtained by adequate supervision. The enginemen must be thoroughly trained in the matter of fuel economy. They must be shown how to get the most out of every pound of fuel fired and further, it must be seen that they follow instructions. The only proper way to do this is by supervision. The addition of a few more supervisors to the fuel organization will be money well spent when the advance in the cost of fuel is considered. More power must be gotten out of the locomotives. Enginemen must be taught how to use their power to the best advantage. This can only be accomplished by careful and proper instruction, together with adequate supervision. To be sure, the war has and will create a shortage of labor on the railways and it may be thought that men can not be spared for this work; but the conservation of the fuel and the greater reliability of the service must also be considered and men enlisted in this work may be of greater service to the railroads of the country, than in any other place. It is a problem which should be given the most careful consideration.

A note on another page tells of the excellent record of a New Orleans firm in unloading one-fourth of its cars on the same day that they came in; that is, before the railroad would begin to count the time. This note is a reminder that the smaller traders—those who load or unload from three to a dozen cars a week—present the most difficult problem in car conservation. The large establishments can employ an experienced traffic man to give his whole energy to the work, driving others, where necessary, and keeping everybody constantly alert. With operations of less magnitude, the station agent and the shipper or consignee have got to combine their

efforts and co-operate, else the necessary enthusiasm will be lacking. The trainmaster must spur the agents, if they need spurring, and the division freight agent must arouse any slow consignee. It is particularly important to make plain to the consignee that the good records of the large establishments are not due to any favoritism extended by the railroad. Neither should railroads ask the merchant to improve his service simply as a favor to the carrier. Every reasonable railroad man does surely appreciate favors in this field, and it is to be hoped that he never forgets to express his appreciation; but the main argument to be presented to the public is a lucid and forceful statement of the cold facts, frank, full and detailed. Car conservation helps all concerned; to tell this to all concerned is a never-ending job.

In the study of railroad accidents and their causes there is a constant necessity of remembering the comprehensive nature of the term "accident." Not the least of the accidental features of such casualties is the accident of time and of place. In the butting collision of trolley cars at North Branford, Conn., on August 13, seventeen persons were killed; and everybody who travels is justly indignant as he reads of the incredibly careless management which continues to use, with high-speed electric cars, the same old methods of operation which prevailed in the days of horse cars. But only seven days later, within 25 miles of North Branford (near Saybrook Junction), half as many persons lost their lives in a "railroad accident" for which the railroad management is in no sense responsible. Nine out of ten persons, riding in an automobile, were killed by a locomotive at a railroad crossing. A cynic might, very plausibly, ask why, if people will rush to their death voluntarily, at crossings, there should be so much outcry when they are killed in the cars! Neither of these "accidents" has any relation to the other, so far as the details of prevention are concerned. Yet their being so nearly in juxtaposition may well call attention once more to the need of getting down to actual causes and of patient attention to the real issues, in every case, uninfluenced by special interests or the clamor of shortsighted advocates.

Awaken the Small Shipper

The fact that within a given territory, within a given time, a hundred people are killed on railroad premises by their own fault, when only a half or a tenth of that number are killed by the fault of the railroad or its employees does not, indeed, afford any excuse for the railroad, or justify any relaxation of efforts at improvement; but it does show that a good deal of the activities of press and legislature are misdirected, and that much of the time of the courts is wasted. The operation of twenty thousand miles of busy railroad—in Great Britain or America—for a year or longer, with not a passenger killed except by his own fault, is a great achievement. This is one side of the shield. A statement of all casualties, great and small, on the steam railroads of the United States for a year—one hundred and eighty thousand, three hundred and seventy-five in the last report issued—shows the other side. Each figure has its own lessons; but each side of the shield is often shown in such a way as to lead the superficial observer to think that he is looking at the other side. If a clear distinction were always made between "railroad accidents" not due to the fault of either railways or their employees and railroad accidents actually due to them, it would be easier to secure intelligent regulation to reduce accidents.

A PRIZE FOR A STUDY OF THE RECONSIGNMENT PRIVILEGE

IS the reconsignment privilege as it is used and abused now a pernicious form of rebate or has it become so much a part of the commercial customs of the country that it would be economically wrong to make a substantial charge for this privilege? There can be no doubt that the reconsignment privilege puts a very heavy burden on the railroads. Just how heavy the *Railway Age Gazette* would like to demonstrate. Specific instances are occasionally made public where this reconsignment privilege is grossly abused not only to the detriment of the railroads but of the consumers. In some of the investigations made last winter at New York in regard to food speculation it was brought out that a carload of perishable foodstuff was sometimes sold a dozen times over, and nearly each time it was sold a reconsignment was made. A carload of potatoes was sold by a local jobber to a New York jobber and by him sold to a Chicago jobber and the car reconsigned to Chicago; the Chicago jobber sold it to a Cincinnati dealer and the car was reconsigned to Cincinnati; the Cincinnati dealer sold it to a Cleveland dealer and the car was reconsigned to Cleveland, and so the thing went on through half a dozen more transactions covering a period of more than thirty days. All this time the car itself was standing in the yards in one of the upstate cities of New York.

Yardmasters and station agents are the railroad men who have first-hand knowledge of the extent to which the reconsignment privilege is used, the kinds of commodities that are reconsigned, and the expense to which the railroad company is put. In order that this subject may be fully discussed and as much light thrown on it as possible, the *Railway Age Gazette* offers a first prize of \$50 for the best article dealing with this subject and a second prize of \$25, and will pay space rates for any other articles that are used. Discussions of this subject should be condensed as much as possible but no rigid limit will be placed on the length of articles. Contributions should be sent to the Woolworth Building, New York City, and must reach New York not later than September 29. The *Railway Age Gazette* reserves the privilege of condensing any statistics which are presented if such condensation can be done profitably.

Three judges will be selected and their names announced in the near future. What is especially desired is a statement of facts culled from experience. Such information in regard to reconsignment as this contest may bring forth

should be of value, especially at the present time. The names of roads will, if the author so desires, be held confidential, but we strongly urge competitors to name commodities and to give figures for length of time held, destinations to which reconsignments are made, etc., and to discuss the subject with the greatest possible frankness. It is through such a discussion as this, if participated in by a sufficiently great number of men with first-hand knowledge of the subject, that the *Railway Age Gazette* hopes to be able to make available the facts.

RECENT INCREASES IN RAILWAY EFFICIENCY

IT is becoming well understood that, second only to success in enlarging and training its army and navy, the thing most needful to enabling the United States to do its part in winning the war is to increase the efficiency of all the country's productive and distributive processes. Of all the concerns which have increased their efficiency in this good cause the railways probably stand foremost. They are today handling a much larger amount of traffic with each freight locomotive and each freight car than was ever done before in their history or in that of any other railway system in the world.

Those who like to snarl at the railways ask why it required a national crisis such as the present to cause their managers to introduce more efficient methods. It did not. They were constantly introducing more efficient methods long before we got into the war. The doctrinaire advocates of government ownership, such as Frederic C. Howe, say that the increases in efficiency are due to concentrated control and that therefore they are an argument for government management. But neither the premise nor the conclusion of this argument has any foundation. No government railways ever got such operating results as our railways are now getting; and our own railways would not be getting them if they were under government management. It is not merely the concentrated direction, but it is still more the brains and energy that are being put into the general direction of the roads, and into their operation that are getting the results. Such brains would not be put into their direction and operation under government ownership.

We said above that the efficiency of the railways was being constantly increased before our entrance into the war. The facts regarding the increases in efficiency which have occurred both since the country entered the war, and during the year preceding, make a remarkable story. We shall try to tell here only the part of it relating to the augmentation of the service rendered by the railways with each locomotive and each car.

The largest freight traffic handled by the railways in any fiscal year prior to 1916 was that for the fiscal year ended on June 30, 1913. In the years ended on June 30, 1914, and 1915 the traffic showed heavy reductions, there were many idle cars throughout both years, and therefore it was impossible to secure the maximum service from each engine and car. In fact, the traffic was so light and earnings were so small that purchases of new equipment became very small and there were actually 29,351 fewer freight cars and about 700 fewer locomotives in service on June 30, 1916, than there were on the same date in 1915, and 340 less cars than there were on June 30, 1914.

With this reduced number of cars and locomotives the railways had to handle in the fiscal year 1916 much the largest traffic they had ever had. With a slight increase in cars and locomotives they handled in the calendar year 1916 a still larger business, and with an increase of less than 1 per cent in locomotives and of perhaps 3 per cent in freight cars they are today handling a vastly larger business than they did in the calendar year 1916.

What do these facts indicate as to the increases which have occurred in the service being derived, on the average, from

each locomotive and each car? The following table throws light on that question:

TON-MILES HANDLED PER FREIGHT LOCOMOTIVE AND PER FREIGHT CAR

	Per Freight Locomotive	Per Freight Car
Fiscal year 1908.....	6,461,907	104,524
Fiscal year 1909.....	6,424,796	105,514
Fiscal year 1910.....	7,237,369	114,755
Fiscal year 1911.....	6,913,289	115,593
Fiscal year 1912.....	7,056,034	119,194
Fiscal year 1913.....	7,843,663	132,566
Fiscal year 1914.....	7,368,713	123,974
Fiscal year 1915.....	7,087,491	117,483
Fiscal year 1916.....	8,954,248	147,444
	Per Freight Locomotive	Per Freight Car
*Calendar year 1916.....	9,953,660	162,630
*Increase 1916 (fiscal) over 1908 (fiscal).....	38.6 per cent	41.1 per cent
*Increase 1916 (fiscal) over 1915 (fiscal).....	26.3 per cent	25.5 per cent
*Increase 1916 (fiscal) over 1913 (fiscal).....	14.2 per cent	11.2 per cent
*Increase 1917 (calendar) over 1916 (fiscal).....	28.4 per cent	27 per cent
*Increase 1917 (calendar) over 1915 (fiscal).....	62.2 per cent	59 per cent
*Increase 1917 (calendar) over 1913 (fiscal).....	46.6 per cent	41 per cent
*Increase 1917 (calendar) over 1908 (fiscal).....	77.4 per cent	78.9 per cent

* Estimated.

The statistics for the calendar year 1916, while estimated, are based upon the number of freight cars and locomotives known to have been in service and upon the actual freight earnings during the year. The estimates for the calendar year 1917 are based upon the assumption that each car and each locomotive will handle 15 per cent more freight in the year 1917 than it did in the calendar year 1916; and this is a perfectly safe estimate, in view of the records which are known actually to have been made in the movement of traffic during the three months of the year already past. The available statistics indicate an increase of 13 per cent in freight car efficiency in April, 14 per cent in May and 22 per cent in June. They indicate even greater increases in locomotive efficiency.

Going back to the period before we entered the war, the statistics show that in the fiscal year 1916 the railways handled 14 per cent more freight business with each freight locomotive and 11.2 per cent more freight business with each freight car than they did in the fiscal year 1913, which was the banner year before. In other words, they handled 7,843,663 ton miles with each engine and 132,566 with each car in 1913; and 8,954,248 with each engine and 147,444 with each car in 1916. The increase per locomotive in 1916 over 1915 (fiscal years) was 26.3 per cent and per freight car 25.5; while in 1916 over 1908 the increase per locomotive was 38.6 per cent and per freight car 41 per cent.

The calendar year 1916 showed a still further great increase in efficiency. As compared, for example, with 1913, the banner fiscal year prior to 1916, the increase in business handled per freight locomotive was 27 per cent, and per freight car 23 per cent. It will be noted that the foregoing increases in efficiency occurred before the United States entered the war and before the centralized direction of the railways by the Railroads' War Board was established, and that therefore all talk about the railways not having increased their efficiency until we got into the war is groundless.

The entrance of the country into the war, however, affording, as it did, the opportunity to operate the railways as a single system, and to appeal to the individual managements, the employees and the patrons of the railways, on patriotic grounds, to co-operate vigorously in increasing their efficiency, has enabled some remarkable improvements in the use of engines and cars to be made. As the table shows, if the railways handle relatively as much more freight traffic in each remaining month of the calendar year 1917 with each locomotive and car as the improvement in their performance in April, May and June indicates that they will, they will make a record far surpassing their best past performance. With each locomotive we estimate they will handle 28.4 per cent more business than in the fiscal year 1916; 62 per cent

more than in the fiscal year 1915; 46.6 per cent more than in the fiscal year 1913, and 77.4 per cent more than in the fiscal year 1908. With each freight car we estimate that they will handle 27 per cent more business than in the fiscal year 1916; 59 per cent more than in 1915; 41 per cent more than in 1913 and 79 per cent more than in 1908.

When it is considered that the remarkable increases in the efficiency of the use of equipment which have been made since the present organization under the Railroads' War Board was formed have followed directly on the heels of unprecedented increases in the efficiency of its use in the year or year and a half immediately preceding, the record becomes a very remarkable one.

The railways will never get credit for what they have done and are doing from the doctrinaire advocates of government ownership, or from those who consider it good business or good politics to snarl at them; but they will get full credit from the American public when the facts become as widely known as they should be.

ARREST THE DETERIORATION OF RAILWAY TRACK

THE track of most railroads is not being maintained to normal standards today. As a result it is deteriorating at a time when the country is demanding the maximum service from the railways. Such a situation would be serious at any time. It is doubly so now when it is vital that transportation facilities be kept in the best possible condition.

The roads of the United States are handling the heaviest traffic in their history. As noted on page 220 of our issue of August 10, statistics covering the operations of Class 1 roads—those earning over 1,000,000 gross annually—for the first five months of the present calendar year show operating revenues of \$1,548,348,314, an increase of \$348,000,000 or 29 per cent over the same months of 1913, the period of highest railway earnings previous to the war. During the same interval transportation expenses increased 30.3 per cent and maintenance of equipment expenditures 27.6 per cent. Charges for maintenance of way for these same roads for the first five months of 1917 were \$177,319,957, an increase of only \$15,000,000 or 9.3 per cent over 1913, while the percentage of these expenditures to total operating expenses fell from 18.3 per cent in 1913 to 15.9 per cent this year. Thus with an increase in business handled of 29 per cent the increase in the amount of money spent for the upkeep of the roadway and structures was only 9.3 per cent.

This tendency was most prominent in the eastern and southern districts. In the former an increase of 29.2 per cent in operating revenues was accompanied by an increase of only 4.2 per cent in maintenance of way charges. In southern territory a growth of 25.1 per cent in traffic led to only 4.1 per cent heavier maintenance of way expenditures. In the western district conditions were more nearly normal, the 30.4 per cent increase in operating revenues being accompanied by a rise of 16.8 per cent in expenditures for maintenance of way. A striking illustration of the situation on some of the eastern and southern roads is afforded by the statement of operations of an important road in this territory for July which shows an increase in traffic of 20 per cent accompanied by a decrease in maintenance of way expenditures of 22 per cent.

While a superficial analysis of these figures might suggest that this reduction in maintenance of way charges was gratifying, reflecting increased efficiency in this department, more careful consideration will show that this is not the case. The increases in maintenance charges indicated would be too small even in comparison with the growth of the business in normal times, and they are far too small under the present abnormal conditions. Railway rates have remained practically stationary in this period so that a comparison of oper-

ating revenues is a fairly accurate measure of the service performed. Unit costs of maintenance of way work, on the other hand, have been far from stationary. Four years ago the average wage rates for laborers in the maintenance of way department was not far from \$1.60; now it will probably average at least \$2.30, with many roads paying from \$2.50 up to \$3. As approximately 56 per cent of all maintenance of way expenditures are for labor, this increase of almost 45 per cent in unit rates of pay is alone equivalent to an increase of 25 per cent in the total maintenance of way expenses without taking into consideration the greatly decreased efficiency of labor which always follows rapid increases in wage rates in times such as this. Measured in terms of the service performed, the maintenance of way accounts probably have been increased well over 30 per cent by changes in the labor situation alone.

Materials have also risen rapidly in cost, few, if any, now being procured at the same or lower prices than prevailed in 1913. Rails have advanced \$10 per ton and other steel products have doubled in cost and more. While a wide variety of materials are used in maintenance of way work, each with its individual price tendencies, it is conservative to estimate that on the average their cost increased as much as that of labor. Therefore, if the traffic had been the same in 1917 as in 1913 the conditions in the labor and material markets alone would have led to a large increase in expenditures for maintenance of way to secure the same results. As the traffic has increased over 29 per cent in this period a still further increase in maintenance of way expenses should be expected if the wear and tear on the property caused by the movement of this additional traffic is to be overcome.

Instead of the increase in the charges to this account bearing some reasonable relation to the increase in the traffic handled and to the advances in unit costs of labor and materials, the statistics quoted at the beginning of this discussion show that it has been only 9.3 per cent. This demonstrates beyond question that the expenditures for the upkeep of the physical property are not keeping pace with the burden imposed on it by the traffic and by changing conditions. Various explanations, all more or less correct, may be offered for this condition. Labor may be scarce or even impossible to secure. Materials cost more than they did four years ago. These and other facts require no proof as they are of common knowledge to all. But they do not alter the fact that deterioration is taking place.

One of the most disquieting phases of this entire situation is the complacency with which many railway managements seem to be regarding this condition. As a writer states in a letter to the editor in another column, the officers riding over the track see that it is getting rough, realize that the roadmasters do not have a sufficient number of men at work and do little or nothing. Resignation to this state of affairs does not meet the problem, neither does it remove the danger of failure of our railways in the emergency through which they are passing. It is true that a large portion of the repairs on a well-maintained property may be postponed for a short time, but this cannot be done indefinitely. No one can tell the duration of the present emergency. The government is planning on a three years' war. The railways cannot stand the continuance of the present retrenchment in maintenance of way for such a period without disaster. They must meet this situation squarely, and plan at least upon as safe a basis as the government.

This problem is not one requiring the attention merely of those officers whose duties are limited to the maintenance of way department. More help is necessary from the general managers and higher officers. When the demands of the government for transportation are so extensive it is natural that these officers should give almost their entire attention to operating matters in order that troops and mili-

tary supplies may be moved promptly and with the minimum of interference with normal business. As a result of their concentration on the transportation problem they are giving less than the usual amount of attention to maintenance matters at a time when this attention is required even more than normally.

Help is needed and needed quickly. Three months from now, or even two months, will be too late, for the tracks will then be going into the winter. Unless relief is secured quickly and more work is done at once the tracks will be in bad shape this winter, while facing a heavier traffic than they have ever had to bear.

Even with the most active efforts it will be impossible for much of the ground already lost to be made up this year, and there is certain to be a large accumulation of deferred maintenance at the close of the year.

The normal net earnings of the roads are being swelled to the extent that this deferred maintenance is accumulating. Since such amounts are not real savings, but are only postponed expenditures, England has permitted the roads in that country (which are laboring under conditions similar to the railways in the United States), to put aside reasonable amounts to compensate for these postponed expenditures, and the amounts so set aside are included in operating expenses before net earnings are computed, just as if the expenditures had actually been made. The funds thus accumulated will be available for maintenance expenditures as soon as men and materials can be secured without drawing on the earnings of later years. Insofar as it is actually impossible to get men and materials for maintenance, this plan has much to commend it to the railway managements of the United States and to the Interstate Commerce Commission as a sound, business-like proceeding under present conditions.

NEW BOOKS

Railway Nationalization and the Average Citizen. By William H. Moore. 181 pages, 5 in. by 7 3/4 in. Bound in cloth. Published by McClelland, Goodchild & Stewart, Limited, Toronto, Ont. Price, \$1.35.

The Irresponsible Five: A New Family Compact. By William H. Moore. 67 pages. 7 1/4 in. by 5 in. Bound in cloth. Published by McClelland, Goodchild & Stewart, Limited, Toronto, Ont.

The question of government ownership and management of railways is of especial interest in Canada at the present time. There has been much discussion of the way in which the government-owned Intercolonial has been managed and the government-built National Transcontinental has been constructed. The Intercolonial has, on the whole, failed to earn even its operating expenses, much less interest on the investment in it, since it has been owned by the government. The National Transcontinental cost vastly more than the original estimates and the government commission which was created to investigate its construction rendered a report charging gross waste and incompetency in the building of it.

In spite of the fact that government ownership and management of railways in Canada has thus far been a colossal failure, owing chiefly to the operation of influences which it is especially difficult to prevent in democratic countries, the present government has committed itself to the acquisition of the Canadian Northern. This system now has 9,295 miles which, added to the present government railways, will make a state-owned mileage in Canada of over 13,000 miles. The main reason why the government has proposed the acquisition of the Canadian Northern is that the Dominion government has guaranteed the interest on the road's bonds, that it is unable to earn enough to pay its fixed charges and at the same time raise money for necessary improvements and extensions, and that if the government allows it to stay in the hands of its present owners the road will either have to go through bankruptcy or the government will have to continue to make it advances. The government does not wish to

let it go through bankruptcy and at the same time it takes the position that if the people of Canada are to make any more advances to the Canadian Northern they ought to own the road and get the benefit of future increases in the value of the property.

Mr. Moore's book "Railway Nationalization and the Average Citizen," was written before the government's proposal for the acquisition of the Canadian Northern was submitted to Parliament, but it constitutes an excellent answer to all the arguments in favor of this step. In a word, the answer is that government management almost certainly will be more costly and less enterprising than private management. If the road is turned over to government management the public will have to pay whatever deficit it may incur, and the deficit which it will have to pay will be larger than would be the deficit which would be incurred and which the public would have to pay if the railway were left under private management. In other words, under government management the road, because of its more expensive operation, will place a heavier burden on the shippers and taxpayers of Canada than it would under private ownership. It is true that under government ownership there will be no private stockholders to make money out of the property, but how does it hurt the public for private stockholders to make money out of a property if they afford such good management that the burden put upon the public is actually less than it would be if the public owned the property?

The contention that railway transportation actually costs the public, including those who pay the rates and those who pay the taxes, less under private ownership even when private stockholders make money out of it than it does under government ownership, is not merely a theory, but is a proposition demonstrable by the almost uniform experience of the entire world. Nowhere else has experience afforded more support to this proposition than in Canada. It is certainly remarkable that a country in which government ownership has thus far been an utter failure should be planning to extend this policy. The financial and commercial future of Canada would be much brighter if its politicians and people were influenced less by catch-words and more by actual facts.

The reasons why private ownership and management of railways are better for most countries, and especially for democratic countries, than government ownership are very interestingly and entertainingly, and at the same time forcefully, set forth in Mr. Moore's book, "Railway Nationalization and the Average Citizen." In its first two chapters which are entitled "The Platitudinarians" and "The Doctrinaire School," the author attacks those whose arguments for government ownership consist chiefly in the familiar platitudes such as "Trust and the public" and "Public ownership seeks only the welfare of the many; private ownership strives for the wealth of the few," and those who base their arguments in favor of it on "so-called fundamental principles," which on examination prove to be anything but fundamental. One of these latter, for example, is what Mr. Moore calls "the highway argument" and another is "the universal use argument."

Mr. Moore next examines the actual results of the operation of public utilities in Canada, and especially of government telephones in Manitoba, where the failure was as complete as it has been in the operation of the Intercolonial. He next examines the experience of other countries, especially those of Europe, showing that in Prussia, for example, where government management has been a comparative success, the political and other conditions are entirely different from what they are in Canada. He then proceeds to a somewhat detailed consideration of the railway situation in Canada and shows that the railways which have been designed, built and managed under the company system in that country have contributed far more to its prosperity and development than

those which have been designed, built and managed under public ownership.

Mr. Moore's book, "The Irresponsible Five," is a critique of the report made by the majority members of the Royal Commission to Inquire into Railways and Transportation in Canada. The majority was composed of Sir Henry Drayton and W. M. Acworth, and it recommended government acquisition of practically all the railways in Canada, except the Canadian Pacific, and their operation by five trustees who would be chosen by the government, but under the plan favored would be free from political influence. Mr. Moore severely criticises some of the statements of fact in the report and also the plan for acquiring and operating the railways which it recommends.

Both of these books are well worthy of careful perusal by all who are interested in the subject of government ownership of public utilities.

Poor's Manual of Industrials. Published by Poor's Manual Company, 80 Lafayette street, New York. Price \$10.

This 1917 issue of Poor's Manual of Industrials is corrected up to August 1. It contains income accounts and balance sheets of nearly all of the larger industrial companies and is compiled with the care, thoroughness and broad intelligence which Poor's Manual Company has put into its Railroad, Industrial and Public Utility Manuals for a great many years. With a large increase in interest of the investing public in industrials, Poor's Manual fills a real need. Prior to the requirements of the Interstate Commerce Commission in regard to railroad annual reports in 1907, Poor's Manual of Railroads was the one source from which uniform statistics of railroads could be obtained. Now with the Interstate Commerce Commission figures available, Poor's Manual of Railroads is still the most convenient form in which railroad statistics can be got at, but the Manual of Industrials is indispensable to any statistical library because much of this information is not available anywhere else.

Railroad Construction, Theory and Practice. By Walter Loring Webb. 4 in. by 7 in. 841 pages. Illustrated. Bound in morocco. Published by John Wiley & Sons, Inc., 432 Fourth avenue, New York City. Price \$4.

This is the sixth edition revised and enlarged of the well known treatise on railroad construction which is intended both as a text book for the use of students in college and technical schools and as a hand book for the practicing engineer. In the preface of this edition the author explains that the advance in the science of railroad construction made during the last few years has been so great as to make the extensive rewriting of the book necessary. Special credit is given to the American Railway Engineering Association for its work. The first 100 pages are devoted to field engineering—surveys, alignment, curves, etc. Earthwork occupies 84 pages; trestles, tunnels and minor structures cover an equivalent space. About 100 pages are devoted to the various elements of track construction and a smaller space to buildings, yards, terminals and signaling. The relation of train operation to the economics of railway location is discussed in detail as in the earlier editions. Nearly 200 pages are devoted to curve and earthwork tables.

INTERNATIONAL TRAFFIC OF THE SWISS RAILWAYS—In 1916 the passenger traffic of the Swiss Federal Railways with Italy was 38,461 journeys and the freight traffic 700,777 (metric) tons. Passenger traffic with France was 134,871 journeys and the freight traffic 27,859 tons. To and from Germany through passengers numbered 140,619, while the freight traffic was 2,639,817 tons, of which 2,216,138 tons went into Switzerland and 423,679 tons came out.

Letters to the Editor

OBJECTIONS TO UPPER BERTH

NEW YORK.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

At this time, when the railroads are making such strenuous efforts to load cars, including passenger equipment, to full capacity, it may not be amiss to consider the objections made to traveling in upper berths. Speaking from my own experience, and from that voiced by other travelers, here are some of the reasons why upper berths are objected to:

(1) Lack of facilities to care for clothing. The coat hanger and the little hammock are insufficient. Why not attach, in the upper berth, a *folding* shelf, either on the partition, or above or below the hammock?

(2) Lack of a window. Passengers like, especially when traveling through country new to them, to look out early in the morning. I also like to see where we are, so I may know whether the train is on time, and can calculate—when passing a station—how much longer I can stay in bed. Presumably the ingenuity of our car builders will some day provide windows for upper berths.

(3) If retiring early, the light is very objectionable. Perhaps here, too, the ingenuity of our car builders will devise ways and means of overcoming the difficulty.

If the above mentioned conditions are remedied, I don't believe I would care whether I have an upper or a lower berth, and I know other people feel the same about it.

TRAVELER.

SAVE THE TRACK

"Somewhere in America."

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I have been doing considerable reading on war topics and war conditions lately and between the lines I have noticed with deep concern the tendency to let everything slip that does not have a direct bearing on the promotion of the war. This is true in every factory and every mine in the country. It is also true on every railroad. Under the spur of the necessity for preparedness to move troops and ammunition on a minute's notice, the railroads have bent every effort to prepare for the work which they may be called upon to do. They have their rolling stock ready and their engines are virtually under steam waiting for the soldiers to entrain. Everything is in readiness for the first dash, but what about the track?

The track is on the rapid road to ruin the same as the track in every belligerent country in Europe. We have sent some of the best railroad men to Russia because the track there had gone to smash and we are now sending regiments of railroad men, from chief engineers to track laborers, to France to rebuild the track that has been allowed to fail for lack of maintenance. In Germany not only the railroads, but even their wonderful highways have gradually fallen behind until the greatest danger that country now has to face is the total collapse of the one-time perfect system of railroads and highways.

Our railroads have not collapsed (I pray God they never shall), but the same danger is here, nevertheless; and the most significant thing is the attitude of our officers. The general manager is not thinking of the track, but of the train loads of soldiers that must be moved. He rides over my track and knows it is getting bad, but he realizes that I have not been getting the new material I should have and he can see the pitifully small force of track laborers. The division engineer will go over my district and get a rough ride,

but does he write me a note about it? Of course not. Instead he goes to his office and wonders where he can get men for me.

We have a National Defense Board on which there are traffic men, but no track men. There should be a man there who knows track and knows men, a man who could look over the newly established war routes as mapped out by the traffic men and then go over those routes and see the disease that is eating at the very foundation of our defense scheme. He would need to be a man who could see and meet trouble and then tell of it afterward, a man of resource who would have the nerve to demand an army of trackmen to be placed on a given road and to make the working and living conditions for those men such that they would be willing and anxious to do their part.

I know this sounds hysterical. It startled me when first I thought of it, but we have been used to sitting back in the shadow while someone else stood out in front in the spotlight and naturally think we must continue thus. Give us an entire year like the past two months and the railroads of this country will be running on the ties more often than on the rails. Men will not work for us at our wages and under our conditions, and our superiors will not or can not see where we are drifting.

PROMETHEUS.

THE OVERLAP AS SEEN FROM THE FIRING LINE

VAN BUREN, Ark.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I have read with interest your article in the issue of August 10, discussing the merits and demerits of the overlap. This is very interesting reading, and it is refreshing to see so many vice-presidents speak their minds with freedom. Such evidence of a sincere desire on the part of these executives to arrive at a correct solution of such a vexatious operating problem, is, to say the least, an inspiration to the local officers; but in the last paragraph, the imaginary president of this imaginary meeting opines that there is nothing to be done about this matter. He surely meant to add "at this time." Quite likely he is right. It is not for me to dispute him, but what I should like to see would be some discussions of real facts and a continuation of the same until some actual information could be brought out. This being a vital matter, the discussion should be kept alive until a rational, and so far as it is possible, a uniform basis is reached, inasmuch as the blocking of trains is finally an integral part of the general scheme, pertaining to their operation.

I understand that the Pennsylvania Lines West of Pittsburgh operate hundreds of miles of line with automatic signals, where all trains are kept always *two blocks apart*. If this is so, what are the reasons for such a radical departure from ordinary practice? On the surface, it looks as though that road were getting about one-half as much out of its signaling investments as other roads. What reasons do the officers give for this? What do the officers of the Pennsylvania lines, east of Pittsburgh, think of this practice? What does the Government think of it?

These are questions that occur to the local officers, who are at the front, so to speak, in carrying out the details and in enforcing discipline and are therefore very naturally much interested, and discussions such as these tend to keep alive and even intensify their interest and are therefore certainly valuable. As I comprehend it, the problem under discussion is a fundamental one, which embraces the human equation. Human nature is the same everywhere, and we should, with all alacrity, find the fundamentals in the premises. We can not get anywhere with antinomies. We must be riveted generally to verities. Let us find the verity here and then engage assiduously in a campaign directed toward adjustment of the details in keeping with the fixed principle agreed upon.

W. C. MORSE,
Superintendent, Missouri Pacific.

A New Passenger Station at Danville, Ill.

The Chicago & Eastern Illinois Structure Presents a Pleasing Appearance and Embodies Novel Features

THE Chicago & Eastern Illinois has recently placed in service a new passenger station at Danville, Ill., which combines good architectural lines, convenience in operation and permanent construction. The structure also embodies a number of novel features that deserve special notice. In addition to the station building the project involved some track changes and a subway at Fairchild street, the total expenditure being about \$300,000. The station handles an average of about 360 outgoing passengers daily, but the facilities provided are adequate for a much greater traffic. The present train service consists of 10 through trains and 2 local trains on the Chicago-Evansville main line and 4 trains on the Danville-Villa Grove line.

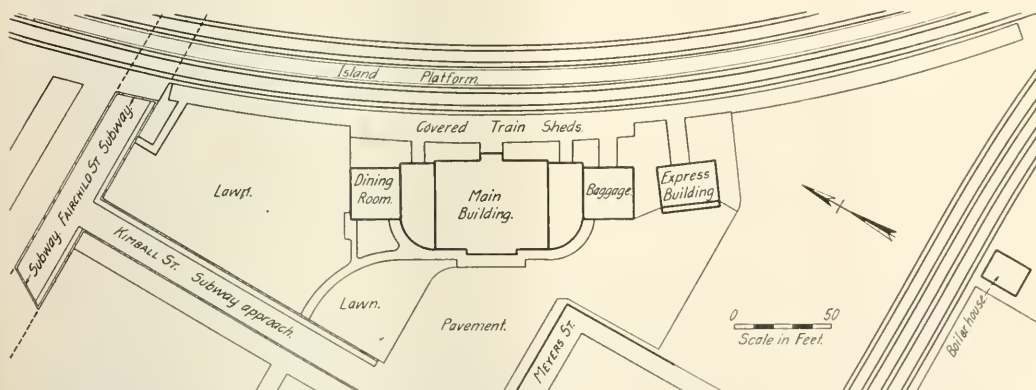
The station is served by three tracks, all of which are on a four-deg. curve. A fourth track on the far side of the layout is used for freight traffic. There are also four tracks along the south edge of the station grounds which are used as a coach yard, the outer track also being used to deliver coal to the station heating plant. The track in front of the station is served by a platform 995 ft. long. There is also

prominence in the central building, and it is emphasized still more over the main street entrance, which is located centrally in the middle of the street side. This entrance is also framed by a band of terra cotta extending to the floor line on each side and is divided into three openings by concrete columns. Further emphasis to this building entrance is afforded by a marquee with a wire glass roof which shelters the doorway, the three-step approach and the concrete carriage landing. The entrance is illuminated by a row of 11 8-in. spherical electric globes along the outer edge and by two ornamental lanterns surmounting pilasters on either side.

Secondary entrances to the station are afforded by the two covered passageways, each of which is embellished on the street side by a row of six concrete columns placed in a quarter circle curve.

CONVENIENTLY ARRANGED INTERIOR

Entering the main doorway the passenger traverses a passageway 25 ft. long and 19 ft. wide, set off as a vestibule



The Station Grounds

an island platform 953 ft. long between the second and third tracks.

PLEASING APPEARANCE

A main building 100 ft. by 78 ft. occupies the center of the layout, being flanked on one side by a baggage building and on the other by a dining room building. The side structures are separate from the central building, but are connected with it by roofs over the passageways between them. An express building similar in design to the baggage annex, but separated from it by a distance of 20 ft., occupies a position on the extreme south of the layout. Ample brick driveways are provided between the street and the main building and between the baggage and express buildings. There is a spacious lawn between the street and the station buildings and platforms.

The walls of the buildings are of a dark red, rough texture brick surmounted by a band or entablature of cream-colored terra cotta. This treatment is carried out with modifications in the covered passageways and the smaller buildings on either side, but an increased width gives it greater

by two sets of doors. This passageway leads directly into the main waiting room, which is 53 ft. wide and 82 ft. long, entirely unobstructed by columns. The walls are wainscoted with vitrified brick in soft variegated colors to the springing line of the arched ceiling. The ceiling is finished in plaster, relieved by a beam effect. Ample illumination is provided. Four ornamental indirect hanging fixtures are suspended from the ceiling, while a continuous line of invisible electric lamps placed in a recess at the top of the brick wainscot afford additional indirect illumination. The floors are finished in a mosaic tile furnished by the National Mosaic Tile Company. At the right or south end of the waiting room are a station master's room, in which is also a Western Union Telegraph office, and a ticket office, separated by a vestibule leading across the covered passageway to the baggage building. At the left end of the room is a similar vestibule leading across the other passageway to the door of the restaurant building. The track or platform door is directly opposite the street door and has a vestibule projecting out onto the platform. In the space to the right of the street entrance vestibule, with a door communicating with the main

waiting room, is a men's smoking room and toilet room. In the corresponding position on the left side is the women's rest room and toilet room. These are finished similar to the main waiting room except that the brick work comes only to the normal wainscoting height instead of extending to the ceiling.

The dining room is finished in plaster with an enameled tile wainscot. Seating accommodations are provided for 24 at the lunch counter and for 36 at 9 tables. Special attention has been given to the installation of only the most sanitary furnishings. In addition to the dining room and kitchen

One special feature of the station is the system of clocks, one being provided over the street entrance, one in the main waiting room and another in the restaurant. These are all controlled by a master clock in the station master's room, which is automatically regulated by Western Union Telegraph service.

STATION PLATFORMS AND SHEDS

The main station platform is protected by reinforced concrete butterfly sheds, 11 ft. wide, with the edges of the roof 12 ft. 8 in. above the base of rail and extending along



View of the Station From the Street

the dining room building contains a basement for the storage of supplies, lockers for employees, etc.

FIRE RESISTING CONSTRUCTION

The building has been designed with a view to securing a high grade of fire-resisting construction. The walls are brick in all cases and the floors are either tile or concrete, the tile being placed on concrete. In the main building the roof is carried on a system of steel trusses covered with a reinforced concrete one-way tile slab. The ceiling consists of plaster on metal lath carried on 8-in. channels suspended from the trusses at 4-ft. centers. The pitched portion of the roof is

the curved platform for a distance of 764 ft. Instead of attempting to cover the space between the standard sheds and the faces of the station buildings with a canopy, branch butterfly sheds are run from the main shed to the doorways of the main building, and to the baggage and express buildings and to the center of each of the covered passageways on either side of the main building. At the north end of the platform a branch of the shed extends down a stairway into the street subway. The portion of the train shed in front of the station involved considerable special work because of the branches to the various doorways, and was in consequence built in place. However, all sections of the shed



Looking South Along the Station Tracks

covered with red Ludowici tile, the flat portion being protected by composition roofing. The roofs of the express, baggage and dining room buildings are composed of concrete-tile slabs, carried on I-beams, the latter structure having a metal lath ceiling suspended as in the main building. The express and dining room buildings have reinforced concrete floors, while the baggage room has a concrete floor on an earth fill. A portion of the space in the baggage room is given for a raised platform 3 ft. high, which is similarly paved with concrete on an earth fill retained by a concrete wall. The express building, in addition to raised platform on the inside, has a raised platform on the outside extending the full length of the building along the driveway.

that were of uniform design were built by the pre-cast method.

The roof consists of a slab 16 ft. long and $4\frac{1}{2}$ in. thick, split at the center line of the shed. The columns, which are "T"-shaped, are 9 in. thick, the stem having a width of 18 in. at the bottom and 12 in. at the top. The base of the stem is secured to the footing pedestals by $4\frac{1}{2}$ -in. dowels. All of the pre-cast units were concreted in a yard located about two blocks from the station and were erected by a derrick car having a 35-ft. boom. A 3-in. stirrup was provided at each end of the slab to facilitate erection, and 1-in. dowels in the top of the column members held the slabs in place at each corner.

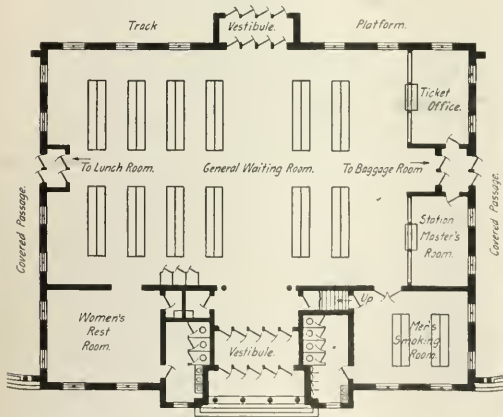
INTERESTING SUBWAY CONSTRUCTION

In connection with the building of the new station a subway was constructed under the tracks at Fairchild street. The interesting feature of this structure is the type of retaining wall used in the approaches. Owing to the fact that the subway is in two sections with 225 ft. of uncovered depressed passageway between them and the necessity of providing an



The Restaurant

approach to Kimball street, on which the station faces, the building of this subway involved the construction of about one-half mile of retaining walls. To accomplish a material saving in these walls a special design was adopted which permitted a material reduction in the amount of concrete as well as in the excavation required. By providing a series

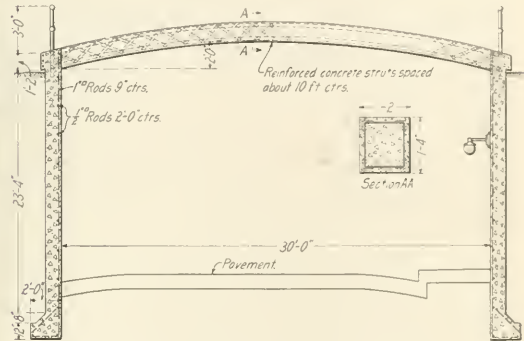


Floor Plan of the Main Building

of concrete struts spanning the roadway, which are designed to take the earth thrust exerted against the upper portions of the walls, it was possible to reduce the retaining wall section to that of a reinforced concrete slab one foot thick with a footing at the bottom two feet in width. These walls are reinforced on the inside face with one-inch square rods placed vertically nine inches center to center. The struts are 1 ft. 4 in. deep by 1 ft. wide, spaced about 10 ft. apart. For the sake of appearance they are crowned 2 ft. at the center. The reinforcing consists of four 3-in. by 3-in. angles, placed near the edges of the strut and connected by bar lacing.

The covered portions of the subway under the track consist of three-centered arches of 34 ft. 8 in. span and 17 ft. 2 in. maximum clear height at the center line. One section of the covered subway has a length of 202 ft. and the other of 105½ ft. Grades of 6 per cent in the roadways were required for all three approaches, but stairways are provided at three points for the convenience of pedestrians. One of these leads to the station ground and another provides direct communication with the north end of the station platform.

Work on the station was started in the summer of 1916 and the station was placed in service in June, 1917. The design and construction of the station were under the general direction of L. C. Hartley, chief engineer of the Chicago &



A Section Through the Subway Approach

Eastern Illinois. Henry Raeder, of Chicago, was the architect for the station and also prepared the designs for the station grounds, the subway construction and the platform sheds, all the work being carried out under his general superintendence. The station and shed construction was under the immediate supervision of J. W. Hunter, division engineer for the railroad. The Clarke Construction Company of Danville, Ill., had the general contract for the station,



The Main Waiting Room

and the M. J. Hoffman Construction Company of Evansville, Ind., had the contract for the platform sheds. The subway was constructed under the immediate supervision of W. H. Martin, city engineer of Danville. The Carson-Payson Company of Danville had the general contract for the subway, the cost of which was borne by the railroad and the city.

WASHINGTON CORRESPONDENCE

WASHINGTON, D. C., August 28, 1917.

SHIPPERS CO-OPERATING ACTIVELY IN HEAVY LOADING CAMPAIGN

The Railroads' War Board, through the Commission on Car Service, is receiving most encouraging reports from all parts of the country indicating a nation-wide co-operation on the part of shippers in the campaign inaugurated by the railroads to bring about a more efficient use of existing freight cars, in order that they may be able the better to provide the increased amount of freight service made necessary by a war which has also made it difficult if not impossible for the railroads to considerably expand their existing facilities.

Reports have come to the board from railroads, shippers and shippers' associations showing that practically every commodity, from coal and steel to food products, is being loaded now in a way to eliminate the waste in freight car space and thereby increase the car capacity available to shippers.

During the month of July, it is estimated, the savings thus accomplished have been sufficient to represent the equivalent of an increase in the number of cars available for freight traffic by practically 120,000.

While the railroads deserve the credit for the initiative which inspired the movement for conservation of transportation by making one freight car do the work of two, because they foresaw its necessity and because they were in possession of the information which indicated to what an extent freight car capacity was being wasted, they are unhesitatingly giving full credit to the shippers, the government departments and to the Interstate Commerce Commission and some state commissions for the co-operation which is making the campaign effective. While railroad officers have been striving for years to do what they are just now beginning to accomplish on such a large scale that its results have become evident to all because they knew that the difficulty of increasing the minimum weights as provided in the tariffs has encouraged shippers in the habit of dealing in small carloads in spite of the steady increase in car capacity, they also realize that the gradually improving showing made during the past two or three months could not have been brought about by the railroads alone. They recognize that a most potent influence has been the new spirit of patriotism aroused by the war coupled with an understanding on the part of the shipping public that transportation capacity has become too scarce, relatively, to be wasted.

This, of course, is the answer to some of the misguided critics of the railroads that have asked "Why did they not do it before?" or who have described the efforts now being made by the roads and the shippers as "the mere exercise of ordinary business principles." The eastern roads have strongly emphasized their recognition of the fact that public co-operation and helpfulness are chiefly responsible for the remarkable record of increased transportation service, in the public notice they issued last week of their intention to compile a record of its results, and the War Board itself, in most of its public notices, does not fail to call attention to its appreciation of this co-operation.

Some conception of the efforts which the shippers are making to help the roads in their campaign to increase transportation efficiency and release cars that are essential to take care of the increased government and commercial traffic may be gleaned from the following facts taken from the reports sent to the Commission on Car Service from various parts of the country:

In New Orleans, sugar, which was formerly loaded to only 50 per cent of the capacity of the cars, is now being loaded from 100 to 113 per cent of marked capacity.

The loading of coffee has also increased in the New Or-

leans district from 50 per cent of the full capacity of the cars to as high as 86 per cent.

At Libby, Montana, a lumber company which in July, 1916, loaded on an average 22,268 ft. of lumber per car, in July this year increased the average loading to 26,383 ft., an increase of more than 15 per cent per car.

A rubber company in the middle west which averaged 16,000 lb. of tires to the car before the campaign for intensive loading began, is now loading 32,000 lb. of tires to the car.

A salt company in Kansas is now loading cars to 110 per cent of their marked capacity, an increase of more than 20 per cent over its performance last year.

An iron company in New York state that formerly loaded pig iron to 90 per cent of the marked capacity of its cars increased its loading to 107.2 per cent during the period July 15 to July 31 inclusive.

A recent check of bituminous coal on one of the eastern roads showed that out of 540 cars only 7 contained lading below the marked capacity of the cars. The total marked capacity of these cars was 27,593 net tons. The weight of the lading per car was 30,667 tons, or a loading of 111.14 per cent of the marked capacity.

In addition to co-operating by intensive loading, a number of shippers and manufacturers' associations have voluntarily agreed to the abolishment of reconsignment and diversion of cars in transit. An example for this action was set by the West Coast Lumbermen's Association on August 14, when it passed resolutions recommending that each and every common carrier in the United States be authorized by the Commission on Car Service to place embargoes against the diversion or reconsignment of all freight, except in cases where it can be satisfactorily shown that the additional haul is made necessary by the insolvency of the consignee or a bona fide refusal of the original consignee to accept the shipment.

* * *

POSSIBILITY OF REDUCTION IN ACCOUNTING REQUIREMENTS

The Committee on Corporate, Fiscal and General Accounts of the Association of American Railway Accounting Officers, which was requested by the Railroads' War Board to investigate the possibility of trying to bring about a reduction in the requirements of commissions and governmental authorities as to accounting and statistical reports during the period of the war, has considered the question and submitted a report. It was decided to forward copies of the report to the chairman of the Interstate Commerce Commission and to the president of the National Association of Railway Commissioners for their consideration, with a suggestion that they each appoint committees to meet with the committee of railroad accounting officers and report whether something can be accomplished along this line. The report will be called to the attention also of the Division of Valuation of the Interstate Commerce Commission.

WEIGHING BRITISH PASSENGER TRAINS—During the last three years there have been Board of Trade reports on accidents issued which go to show that the London & North-Western, Midland, Caledonian and North British companies now calculate the weight of their passenger trains by the actual weight of the coaches, and that the Great Western and the Great Northern by the number of wheels. Other companies may, of course, have followed either of these examples, but there has been no report issued that has revealed any such change. The former method, and that still in force on the minor lines, is to count the weight by the number of vehicles, a four-wheeled coach being reckoned as one, a six-wheeled coach as one and a half, and a bogie vehicle as two. Where the weights are used the weight is to be found on the buffer beam.—*The Engineer*, London.

The Film and the American Railroad

Interesting Review of the Extensive Use Made of the
"Movies" for Advertising, Instruction and Entertainment

By T. T. Maxey

Advertising Agent, Burlington Route, Chicago.

THE introduction of the term "moving picture" into the language of our everyday life a few years ago, gave the advertising agents of the big railroad systems a distinct thrill in a new place. "Moving picture" had a welcome sound, and they were not slow to sense its seemingly too-good-to-be-true possibilities. The advent of the moving picture film, provided it proved to be practical, offered a new field for the exploitation of the wares which a railroad has to sell so broad that it was almost entirely beyond conception.

Seeing is believing and actions speak louder than words. Therefore, to be able to photograph, in motion, the wondrous, varied and numerous beauty spots of America, so as to show the life that is there, and parade these pictures before the eyes of the world, would certainly awaken the public to a realization of the value, pleasure and benefit of traveling around a bit and getting acquainted with America, in a way never before possible and hardly dreamed of. Such direct and visual advertising was bound to "strike home" and give the public a desire to climb aboard the limited and go and see the real thing. It likewise meant the pulling away of any artificial props in the mind of the skeptic that the wonders of your scenery, or the benefits of your resort, were far over-estimated in your literature and only partly existed in reality.

The rapid development and perfection of the moving picture camera to a point where it occupies a front seat among the mediums in the publicity band wagon, have been among the wonders of modern times. Hand in hand with this came increased attention from the passenger traffic officers. They, too, began to believe there was something to "the movies" and the dreams of the advertising agents relating thereto; but it was only after their customary thorough investigation to ascertain that there was no Senegambian in the wood pile, that some of them became convinced that the film was entitled to consideration in connection with their advertising plans.

It is only by recounting a few of the many exploits along this line by the principal railroads that one can form an adequate idea of the extent to which the railroads have become users of films in connection with the exploitation of their wares.

Generally speaking, these films may be divided into four grand divisions—scenic, industrial, safety first and educational.

It is but fitting and proper that Yellowstone, the oldest and largest of our national parks, should have been filmed first. As near as can be determined from the records of the writer this actually took place. The antics of Old Faithful, the world's most famous geyser, the beauties of the Grand Canyon of the Yellowstone river and the great falls at the upper end of it, and the attractiveness and comforts of Old Faithful Inn, were successfully filmed for the Northern Pacific. The wide circulation of this film, through the company's lecture bureau and otherwise, has aroused the interest of tourists and travelers in the wonders of Wonderland by disclosing them in a manner not possible by still photographs or mere word description.

The heavy snow-fall of winter before last drove most of the wild animals (especially the deer, antelope, elk, mountain goats and Rocky Mountain sheep) resident in the Yellowstone region down into the Gardiner basin for food

and shelter. This presented an opportunity to secure a film of animal life at close range, the like of which might never again be obtainable in this country. The Northern Pacific was not slow to take advantage of the opportunity and secured what is beyond question the best film of this nature ever taken. The animals were protected by the government and given generous rations of alfalfa.

The Santa Fe was also one of the first railroads to try out the film in advertising. Its first film was used in the windows of its Pacific coast offices at night. Thousands of passersby stopped to see the wonders of the Grand Canyon of the Colorado river as the film reeled them off. The results encouraged the Santa Fe to continue this line of advertising endeavor until it now has completed films of the principal scenic features along its lines.

The Pennsylvania Railroad recognized the value of the film in advertising by making it a unique feature of its wonderful exhibit at the Panama Pacific Exposition at San Francisco. In a theatre which was constructed of two standard all-steel coaches, the Pennsylvania treated visitors to a moving-picture journey over the principal lines of the system, which presented an instructive panorama of the country through which the Pennsylvania runs.

Any one who visited the Washington State Building at the Panama Pacific Exposition and was fortunate enough to see the film which showed a spectacular race between a number of automobiles and a train enroute from Tacoma to Ashford, the entrance to Mount Rainier National Park, shown by the Chicago, Milwaukee & St. Paul, could hardly doubt the value of such publicity or escape having deeply implanted in his mind an intense desire to go to bogging down the old mountain and pick some of the gorgeously-hued wild flowers which blanket this sky-piercing cone below the snow line.

If a prize were offered for the place which has been filmed the greatest number of times, Glacier National Park would probably win in a walk. The rapid exploitation by the Great Northern of the greatness and strikingness of the sawtooth-like Alpine mountain scenery in this vacation paradise has attracted the attention of artists, painters, photographers and moving-picture producers alike from all sections of the world. The Blackfeet Indians likewise presented material for films of which the public would never tire. Their life in their native haunts, their picturesque raiment, the numerous and grotesque ceremonies of Not-Go-Out, Heavy Breast, Buffalo Body, Many Tail Feathers and others of the tribe, have delighted many Americans—both young and old. Those who saw the Lyman Howe travelogue for the 1915-1916 season will at once recall the wonderful pictures of Glacier Park and the Indians. A large amount of newspaper publicity, which could hardly have been purchased at any price, directly resulted therefrom. The Great Northern has also used films extensively, in connection with its lecture bureau, with telling effect.

The Union Pacific system, in connection with its lecture bureau, has also made considerable use of the film in exploiting the scenery in the west and along the Pacific coast.

The Southern Pacific has some splendid films picturing the beauties of the Yosemite valley and other sections of California.

The little one-day journey from Denver, which has be-

come familiarly known to so many tourists as "The Georgetown Loop and Mt. McClellan Trip," via the Colorado & Southern and Argentine & Gray's Peak Railways, was filmed this past summer.

The Denver & Rio Grande has likewise had the beauties of the world-renowned Royal Gorge recorded in film, as well as the wonderful archaeological remains in Mesa Verde National Park.

Some of the Canadian lines, particularly the Canadian Pacific, have produced considerable film. This road has filmed the beauties of the Canadian Rockies, Nova Scotia (Evangeline Land), and the winter sports of Quebec; and has also taken some film in Alaska.

The Burlington had the principal features of its various main lines covered by "movie" camera men last summer, and it plans to create a nation-wide desire to go and see the real wonders which these films portray. Experts have pronounced these to be the finest scenic films yet produced. In these films the Burlington has largely forsaken the old style, or black-and-white, film and enhanced both their beauty and attention value by the use of tints and tones—sepia, green, blue, yellow, pink—each section carrying that particular tone or tint which more nearly portrays the natural beauty of the subject. Several very attractive novelties in the way of titles have also been worked out.

The ceremonial exercises at the Fortieth Anniversary of the Custer Battlefield was the subject of the Burlington's first scenic film. This was followed by films of the Cody Road in Yellowstone Park; Rocky Mountain National-Estes Park, Colorado; Thermopolis Hot Springs, Wyoming; Central Wyoming, covering the new joint Burlington-Colorado & Southern Line between Billings, Montana and Denver, including the gigantic canyon of the Wind River, the great oil industry near Casper and the great cattle and sheep industries which center around Douglas; and the Vacation Ranch Resorts in the Big Horn Mountains of Wyoming, showing where men who do big things go to "let down" and become boys again for a time.

No doubt other roads have also produced films of various scenic regions and subjects of which the writer has no immediate knowledge.

Most of the above-referred-to roads have also used films more or less extensively in connection with the exploitation of their industrial, immigration or colonization work.

The Great Northern has films showing the Wenatchee Valley fruit industry and various other agricultural regions in "The Zone of Plenty." That the farmer-student amasses a sufficient fortune to become independent in a remarkably short time is so apparent to those who see these films that a strong urge to investigate is thereby aroused.

The Northern Pacific has films intended to convey in a forceful manner the great opportunities in "The Land of Fortune" that beckon the city-tired man who wants to better his condition.

The Soo Line has used so-called industrial or agricultural films quite extensively. Its films vividly portray the resources and opportunities existing along that line in North Dakota. The Soo has met with such success in this work that additional films have been taken recently.

The Canadian Pacific has films showing the asbestos industry of Quebec, the elevators and other facilities at Ft. William, the great grain shipping port at the head of the Great Lakes, and the lumbering and fishing industries in New Brunswick.

The Burlington uses a film titled "The Romance of Irrigation," which illustrates how a school teacher in the east who became dissatisfied, wrote to the U. S. Reclamation Service at Washington, D. C., and secured information which led her to take up an irrigated homestead on the Shoshone Project near Powell, Wyoming, and how she "made good." The Burlington also has a film which shows

strikingly how two farmers from the east, who had the nerve to back up their good judgment and buy raw \$10-an-acre prairie land in Northeastern Colorado a very few years ago, raised abundant crops, surrounded themselves with comforts which many city-men cannot afford to enjoy and became "well to do" in a remarkably short time.

A number of "safety first" films have made their appearance. The film which leads the procession in this line, is that entitled "The House That Jack Built," produced under the direction of M. A. Dow, general safety agent of the New York Central Lines. This well acted, effectively staged and very convincing photo play provides a most effective channel through which to convey lessons in safety to employees. Every scene in the film is true to life. It points out in an unmistakable manner the far reaching and unhappy effects of carelessness and the many sad and unfortunate accidents which have been the result thereof. "Steve Hill's Awakening," is the title of another safety first film produced by this road. The Burlington and many other roads have circulated copies of this film with beneficial results.

The Rock Island has also produced films showing views of men doing dangerous work and illustrating the right and wrong way of doing such work. It is needless to say that the circulation of such film has been instrumental in greatly reducing the number of accidents to employees.

The Chicago Railways Company (Surface Lines) have also produced some safety first films, for the education of the public as well as their employees. These films show the proper and improper way of getting aboard and alighting from a car; the dangers of permitting children to play on the car tracks, and other features which have a bearing on the operation of their cars in the streets of Chicago. These films have been widely circulated in churches, schools, etc., with splendid results.

When the Milwaukee's Puget Sound extension was being pushed through the Rockies and the Cascades some heavy construction, requiring unusual engineering skill, was encountered. In order that the public might form some conception of the almost insurmountable obstacles that are found in the path of a trans-continental railroad, the road filmed some of the most remarkable features of this work, which, with the scenery that naturally found its way into the picture, made a most favorable impression on its audiences.

The Burlington has also produced two out-of-the-ordinary films of an educational nature. One shows how this road helps to conserve the national timber supply and makes one tie do the work of four—being a trip through its immense timber preservation plant at Galesburg, Ill. One cannot view this film without getting aboard the idea of what happens to a tie there and why. The other film is the story of "How the Mississippi River was Harnessed by Man, at Keokuk." It shows the huge hydro-electric development of the Mississippi River Power Company—the ultimate capacity of which is to be 300,000 h. p.; it takes one out on to the gigantic dam which is said to contain sufficient concrete to build a sidewalk three feet wide and 1,500 miles long, and through the power house where approximately 8,000,000 lb. of machinery revolve once a minute; it shows how boats are put through a lock which has a lift higher than those in the Panama Canal, and how the entire plant, which cost about \$26,000,000, is operated—the natural inference being that the ample supply of cheap electrical power available in this region will force an industrial development of unusual importance and that countless opportunities will follow in its wake.

An over-dose of films that were neither pleasant, instructive or entertaining has brought about a demand for a different, better class of films from the majority of moving picture theatre patrons. The impetus of the "See America First" movement has had its effect. Many of these better-

class travel films will find their way into the best of moving picture houses, and receive a hearty welcome from the audiences because of their beauty, educational value and pleasant entertainment. There is also a great and continuously increasing demand for films from Y. M. C. A.'s, universities, schools, clubs and churches. Seven hundred and fifty-nine out of the 2,583 Y. M. C. A. buildings in the United States are now equipped with standard moving picture machines. Such apparatus is also fast becoming a part of the regular equipment of school buildings everywhere. In fact, the channels through which circulation for good films may be obtained are many and varied. To cite a concrete example of how far reaching they really are, however, let me say that it is estimated that one-tenth of the entire population of the United States will have had an opportunity to see the Burlington films before their circulation shall have been completed.

So much for what the film has done for the railroad. This article would not be complete, however, without some mention of the prominent part which the railroad has played in the production of modern "movie" dramas. In a large percentage of the films you see, there is a train or track or station scene—something to remind you of the railroad. The studios of many of the largest film-producing companies are located in Southern California along the lines of the Santa Fe, Southern Pacific and Salt Lake Route. Signal, a station on the latter road, for instance, is used almost exclusively by motion-picture people. "Get the proper effect—cost be hanged," must be the working motto of the directors; and special passenger and freight trains are frequently chartered in order to do this. The well known railroad photoplays "Whispering Smith," "The Lass of the Lumberlands," "The Girl and the Game" and "The Railroad Raiders" now running, are excellent examples of this. The Salt Lake Route's passenger locomotive No. 3708, which was shown with so much pride at the San Francisco exposition, has been used so frequently in the production of films that it has become almost a "prop" of the motion picture directors.

OIL-ELECTRIC MOTOR CAR

A new type of self-propelled car which is operated by a 150-hp. oil engine connected to a generator in connection with a storage battery having a rated capacity of 438 ampere hours at the five-hour rate, has been built for the Nashville, Chattanooga & St. Louis by the Electric Car & Locomotive Corporation, 165 Broadway, New York City. This car is the most powerful self-propelled car yet constructed, and

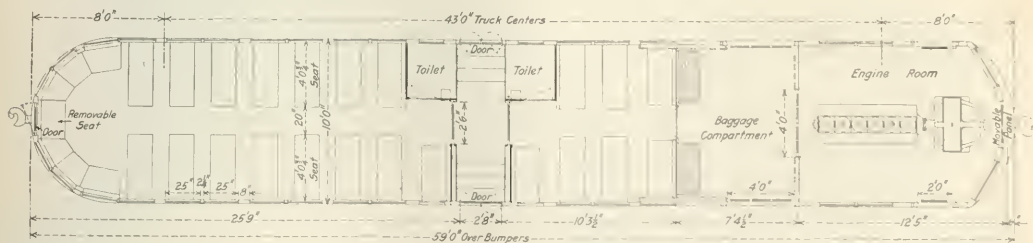
fifth of the present cost of steam operation. From tests it has been found that the car will run $2\frac{1}{2}$ miles per gallon of kerosene oil, and 50 miles per gallon of lubricating oil. Its rated speed is 45 m.p.h., and the rated acceleration is .8 m.p.h. per second. Its service is, therefore, not limited to branch line service, but it could be used to advantage in high speed interurban work and between divisional point-on railways. This car is to be used between Nashville and Lebanon, Tenn., a distance of 32 miles. On this run there



View of Passenger Compartment of the Oil-Electric Car

is a short grade of 2.25 per cent and a grade a mile long of 1.7 per cent. Three round trips will be made per day with the car.

The power plant in the car is of particular interest. A standard four-cycle, eight-cylinder, 150-hp. oil engine of the marine type is direct-connected to a 100-k.w. differential compound wound, 250-volt d.c. generator, running at a constant speed of 1,000 r.p.m. This engine will burn either kerosene or fuel oil, and is so arranged that no carburetors are necessary. The oil is fed to the cylinders in a gassified state. From the storage tank the oil passes to a gas generator, which converts the liquid fuel into a permanent fixed gas. This generator is located in the muffler of the exhaust, thus absorbing the waste heat from this source



Floor Plan of the Beach Oil-Electric Motor Car

with the combination of the generator and storage battery a large reserve of power for peak loads is obtained. The car was invented by Ralph H. Beach, and it is designed to take the place of steam train service on branch lines and small railways where such service is unprofitable. It is claimed that this car will operate at from one-third to one-

for gassifying the oil. From the generator the gas passes directly to the engine cylinders, being mixed with air in the proportion of one part of gas to six parts of air where the kerosene is used. This mixture burns in the cylinders without smoke or any carbon deposit on the walls of the cylinders. The gas generator has no moving parts and no deposits of

carbon, tar or by-products of the oil are found to remain in the generator.

The storage battery is suspended underneath the car body and operates in parallel with the generator. It is characteristic of a storage battery that as the load increases the voltage declines and as the load declines the voltage rises.

The generator is so constructed that it will automatically coincide as to voltage with the battery. In a generating plant constructed in this manner, the generator will deliver current up to its capacity, and at the same time will work in unison with a storage battery, which by itself will supply any excess of current that the load may require. This battery is capable of delivering 400 hp. for 5 minutes, 210 hp. for 15 minutes, 93 hp. for one hour and 30 hp. for 5 hours. This power in addition to the 150 hp. developed by the generator gives the car abundant amount of power for acceleration and for use in working over heavy grades.

With this arrangement the engine works at nearly full load constantly, therefore getting its maximum efficiency. All power required above the capacity of the engine is furnished by the battery, and all power generated by the engine, not required to drive the car, charges the battery. The battery furnishes convenient source of energy for starting the engine, lighting the car and driving the auxiliary apparatus. It also furnishes a complete and separate source of energy in case of failure of the engine to perform its work, having sufficient capacity to operate the car about 35 miles.

The body of the car is made of steel with the exception of the interior finish, sash and doors, which are mahogany. The car weighs 113,000 lb., is 59 ft. long and is divided into four compartments, as follows: Engine room 12 ft. 5 in. long; baggage room 5 ft. 5 in. long; smoking compartment 10 feet; main passenger compartment 25 ft. 6 in. The entrance to the car is between main passenger and smoking compartments. It is provided with folding doors and a trap door to cover the steps when the door is shut. In addition to the side entrances there is an emergency exit at the end of the car, a sliding door with a drop window at each side of the engine room and 4 ft. sliding doors in the baggage compartment. The car has a total seating capacity of 75 people, the baggage room being provided with folding seats

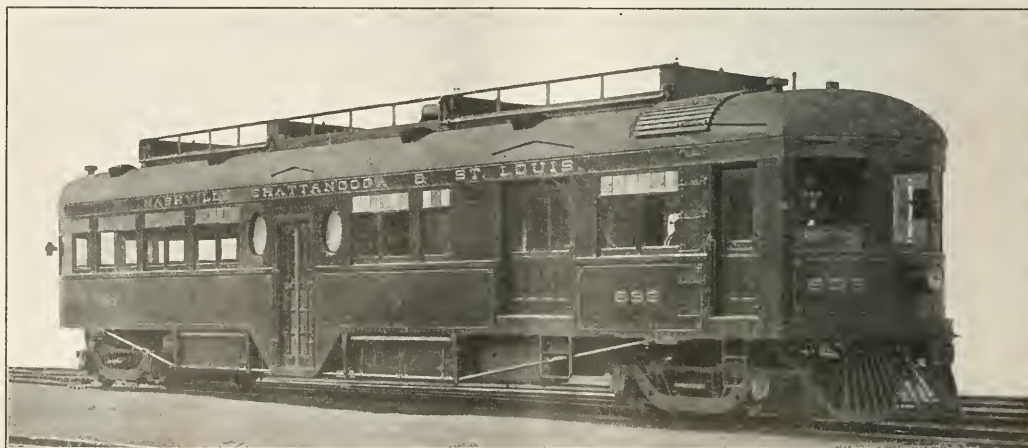
tains, incandescent lights and stationary seats. The car is fitted with an M.C.B. drawbar and incandescent headlight. It is heated with hot water from the engine, which is by-passed when it is not wanted.

The car is provided with two four-wheel trucks made by



Front End of the Oil-Electric Car

the Baldwin Locomotive Works, of the equalized high speed type. The trucks have a 7 ft. 3 in. wheel base and are provided with 33-in. M.C.B. rolled steel wheels. The journals



Beach Oil-Electric Motor Car

for four persons, the smoking compartment has a capacity of 18 persons and the main passenger compartment has a seating capacity of 53 persons. Each passenger compartment is fitted with a lavatory, basket racks, Pantasote cur-

are 5 in. by 9 in. The type of control used on this car is the standard Westinghouse H. L. series parallel type, used for single or train operation. Four standard 250-volt box frame railway motors, having a horse-power of 75 each, are

mounted one on each axle. They are inside hung and are equipped with standard gears and cases. The Westinghouse straight and automatic air brakes for single and trailer operation are used, as well as the hand brake. Multiple tube type radiators mounted on the roof with forced circulation are used to cool the water from the oil engine. There are two oil tanks having a capacity of 140 gallons each. Air operated whistles, single gong and sanders are furnished with the car.

The following are the estimated figures for the cost of operating this car. The amount, of course, will vary with the service required and upon the scheduled speed, distance between stops, grades, etc. These figures, however, are prepared covering average conditions.

	Per Mile
Wages	\$0.0745
Fuel and lubrication	0.0400
Repairs and supplies	0.0350
Depreciation	0.0385
Total cost	\$0.1880

THE TRAGEDY OF THE EMPTY CAR

By J. L. Payne

Comptroller of Statistics, Department of Railways and Canals of Canada.

The empty car attaches to the tragic side of railway operation. It is the obscure burden which every railway is compelled to bear without compensating consideration for any quarter. A callous public looks on with indifference. In fact, the casual critic of railway administration takes no account whatever of the empty car. He fancies that cars are always loaded when in transit, and loaded at highly profitable rates. Yet the empty car is ubiquitous, chokes terminals, blocks sidings and in a very large and comprehensive sense is the despair of the operating department. It intrudes very conspicuously into operating cost.

Biologists talk about the malignant part played in the human body by the so-called vagrant cell. The empty car is the railway analogue. It plays a double role, and in both parts finds a place in the adverse column. It gives trouble when it is tucked away in the yard and classified in the car association accounts as "surplus"; and it is no less an undesirable when in motion. In both cases it is directly unproductive. It cannot be got rid of by any sagacity on the part of the superintendent. It is both unavoidable and inevitable.

In a moment of inquisitiveness I undertook to investigate the life history of the empty car. This led to depressing discoveries. For my purposes I selected the experience of the Canadian Pacific Railway, for three reasons: First, because the records were immediately under my hand; second, because this is a large railway, probably the largest system in the world; and third, because the Canadian Pacific is an exceedingly well-administered road, prosperous in an exceptional degree, and therefore represents what might be regarded as favorable conditions. That is to say, the degree to which the Canadian Pacific finds the empty car a problem and a costly care might safely be taken as applying with equal force to every other large railway.

Here is a little table compiled from C. P. R. reports which tells its own sad story.

	Mileage of loaded cars.	Mileage of empty cars.
1907	338,742,798	101,363,491
1908	319,507,176	110,373,337
1909	354,798,284	106,472,294
1910	433,498,875	118,134,609
1911	460,739,921	139,455,186
1912	556,234,798	140,210,180
1913	581,397,285	165,637,992
1914	526,194,125	169,768,346
1915	404,249,594	144,408,327
1916	603,705,406	280,241,711

My first thought was to discover, if I could, some more or

less constant law governing the proportion of empty cars to loaded cars. I couldn't find it. The volume of traffic, for example, did not afford a clue. The facts were as follows:

	Tons of freight.	Percentage of empty car mileage.
1907	14,910,429	23.0
1908	14,232,306	25.7
1909	15,701,281	23.1
1910	20,551,368	21.4
1911	25,536,214	23.2
1912	25,940,238	20.1
1913	29,471,814	22.2
1914	27,801,217	24.4
1915	21,001,506	26.3
1916	29,276,872	31.7

Obviously the tonnage of traffic requiring to be moved did not have a direct bearing on the percentage of empty car mileage to total freight car mileage. For example, in 1911 the percentage was 23.2. In 1912 the movement of freight was on a larger scale, and yet in that year the percentage declined to 20.1. A glance at the figures for 1914 and 1915 will show the absolute reverse. But I found that there was revealed in the ten-year period a distinct tendency on the part of the percentages to rise. The two highest figures are found at the foot of the table. Moreover, while the average was 23.2 for the first five years, it was 24.9 for the second period.

My second suspicion was that this growth of the empty car ratio might be due to weakness in the trainload or carload. Again I was disappointed. The upward movement had taken place in spite of quite remarkable betterments in the average number of tons per train mile and the average number of tons per car mile. For example, the C. P. R. trainload was 303 tons in 1907, moved up to 372 tons in 1912, and reached the maximum of 503 tons in 1916. For the same three years the average carload was 17.13, 18.30 and 22.90 tons, respectively. Thus the capricious empty car refused to be answerable to any law that I could find.

I turned to the records of the Grand Trunk to see whether or not, by comparison with the Canadian Pacific, there could be found any facts which would suggest a curve common to both roads, even to the extent of time. It was my notion that perhaps certain years had developed an abnormal freight movement either eastward or westward which would be reflected in a higher proportion of empty cars on both railways at the same time. Once more I was baffled; for it transpired that there were years when one went up and the other went down. The Canadian Pacific had a variation all the way between 20.1 and 31.1 per cent; whereas the Grand Trunk figures ran between 25.9 and 32.9. The average for the Grand Trunk was 28.3 for the first five years, and 29.3 for the second five, showing that the Grand Trunk is more acutely affected by the empty car trouble than is the Canadian Pacific. The extreme fluctuation in the case of the Canadian Pacific during the ten years was 11.5 points, while in the case of the Grand Trunk it was 7 points. The two roads were alike only in showing an ascending scale; but the ups and downs in neither case followed the changing volume of freight movement.

It occurred to me that the distribution of cars over a long system might account in some degree for the high percentage of empty cars; but once more I landed in a blind alley. The Canadian Pacific had an average haul per ton of 472.13 in 1916, while the Grand Trunk average was but 197.72. If length of line were suspected of being a controlling factor in the matter, then it would follow that the Canadian Pacific would show a high ratio while the Grand Trunk would be relatively low. The facts all leaned the other way. On the whole, the Grand Trunk was a greater sufferer than was the Canadian Pacific. The empty car positively refused to give up the secret of its rise and progress.

The practical aspects of this matter go right down into the vitals of railway life. Most of them are obvious. It

would appal the outsider, especially the layman who can show anybody that freight rates are unreasonably high, to know that in every 100 cars moved over any big line of railway from 20 to 32 of them, according to conditions, are empty. I do not know what it costs to haul an empty car—nobody does—but the effect on operating expenses, I take it, is nearly the same as in the case of a loaded car. Since all the operations of a railway focus themselves in the running of trains, and the freight car is the basic unit of a freight train, it follows quite logically that the undemonstrative empty car—which is entirely omitted from the calculations of the average critic—really absorbs a tremendous proportion of the earnings of the loaded car. In other words, if it were not for the care demanded by the ever-present empty car freight rates could be materially lowered without affecting net results.

ELECTRIFICATION IN SOUTH AMERICA

The Bethlehem Chile Iron Mines Company is about to put into operation its electrified railroad, which is 15 miles in length, extending from the port of Cruz Grande, Chile (about 300 miles north of Valparaíso) to the mining village located about 4 miles inland at Tofo. The iron mine at this point is located about 2,200 ft. above sea level and consists of two hills of iron ore, which is removed somewhat after the manner of trap rock quarrying. It should be noted that, while the mines are only four miles inland, the railroad is 15 miles long; the circuitous route was necessary in order to limit the grades. The railroad is constructed in four loops and the grade is thus restricted to a maximum of 3 per cent which is 14 miles long. The loaded car movement is, of course, down the grade. The railroad is a single-track, standard gage line. The trains will consist of an electric

load of 1,500 tons the locomotive will return approximately 1,000 kw. to the line. The schedule will be so arranged that the empty train going up will take power from a loaded train coming down the hill. Excess power will be absorbed by switching operations at the mines and docks. The air brake equipment on these locomotives provides for either straight or automatic operation. The cars are provided with empty and load brakes.

A power plant has been installed capable of furnishing sufficient power for mining and transporting 5,000 tons of ore per day with provision for sufficient additional equipment to double the capacity. The present equipment consists of two 3,500-kw. Curtis steam turbines generating three-phase 60-cycle alternating current, and one 300-kw. 60-cycle turbine for lighting and small power service.

The railway substation equipment is located in the power house and consists of two 1,000-kw. 2,400-volt direct-current units operating directly from the 2,300-volt a. c. busses. On account of the circuitous route, a considerable saving in feeder copper is effected since a portion of the feeder takes a direct route from the mines to the docks.

At Cruz Grande there is a steam dock equipped with three tracks for delivering the ore to the boats and to the steel bins. On account of the traveling gantry crane which extends over these tracks, it was considered advisable to feed the locomotives on this section of the road from a 1,200-volt third rail. Power is supplied from either of the 1,200-volt generators of the 2,400-volt motor-generator set in the power house.

ECONOMICAL TONNAGE RATING FOR WAY FREIGHT TRAINS

By F. W. Green

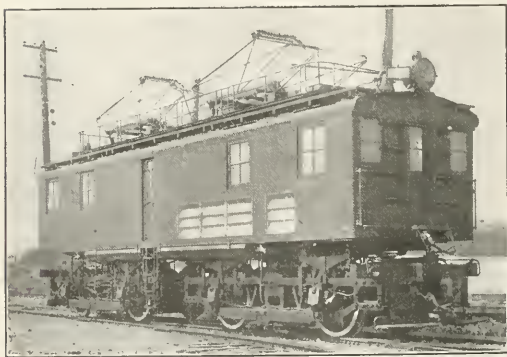
The successful operation of a division depends largely upon the efficient handling of way freight services. The flow of local traffic, especially in those parts of the country where natural resources are but incompletely developed, is constantly changing both in magnitude and direction. A wise superintendent will, therefore, keep a watchful eye on the local service and adapt it to changed conditions. The re-arrangement of merchandise loading schedules at important stations from time to time frequently offers opportunity for large economies.

No hard and fast rule may be laid down as to what tonnage rating is most economical for way freight trains. A large number of variables enter into a consideration of the problem, among which are:

- a. Length of the district.
- b. Traffic density—i.e. number of trains to be met and passed.
- c. Time lost because of station switching.
- d. Time consumed in loading and unloading l. c. l. freight.
- e. Maximum speed permissible between stations.
- f. Character and quality of fuel burned.
- g. Physical characteristics—grades, rise and fall, etc.
- h. Traffic characteristics—number of loads to be picked up and set out.

When the district is so long as to preclude the handling of anything except way freight tonnage within reasonable hours of service for the crew, the rating should be that which will permit the crew to be released at the final terminal without exceeding what is considered the maximum economical time for the crew to be on duty.

As a general rule, but to which there are always to be found just grounds for exception, it is better economy to shorten local districts than to reduce tonnage ratings. Train miles are paid out in exchange for ton miles. The lighter the rating the fewer ton miles per train mile, and consequently the higher the operating cost per ton mile. It will



Electric Locomotive for a South American Industrial Line

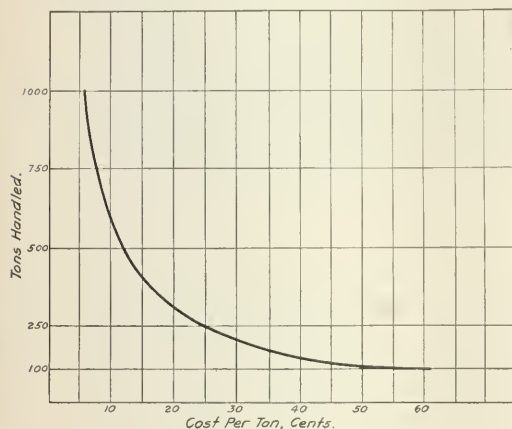
locomotive and from twelve to twenty 50-ton ore cars. The motive power consists of three d. c. electric locomotives which take power from a 2,400-volt catenary trolley supported on concrete poles on the main line and from a 1,200-volt third-rail at the docks. The complete locomotive unit weighs 120 tons and is equipped with four GE-253, 1,500-3,000 volt motors having a normal one-hour rating of 240 hp. each on 2,400 volts. The locomotives are geared for a speed at a rated load of 12.2 m.p.h. and are capable of exerting a tractive effort of 42,000 lb. at the one-hour rating.

In order to provide for suitable control on heavy down grade work, the locomotives are provided with regenerative braking equipment similar to that used on the Chicago, Milwaukee & St. Paul electric locomotives. The trains will descend at about 12 m.p.h., at which speed with a trailing

never be possible to handle tonnage in way freight trains for as low a cost as when handled in through freight trains, because of the wage differentials and the additional fuel and other items required to accelerate and retard way freight trains because of the additional stops as compared with through freight trains. It will, nevertheless, be found that true economy will be had only when the largest practicable tonnage rating that the conditions will permit is hauled on way freight trains. The analysis following is intended to emphasize this latter point.

On the same district, the traffic originating at the same points and of the same volume and moving in the same direction in each case, it may be assumed that the train operating cost per ton moved consists of two items: (a) costs accruing for handling the rating with a way freight crew but moving as a through freight; (b) costs accruing from the additional stopping and starting which a way freight train incurs, but which a through freight does not.

It has already been shown in an approximate way what



Relation of Cost Per Ton Handled to Tons Handled

the cost of starting and stopping trains is. (Proceedings Am. Ry. Eng. Assn., Vol. 16, Part 2, p. 271 et seq.) The cost per stop may be written,

$$c = \frac{70V^2Tq}{495,000} + \frac{0.84(70V^2T)0.00015}{495,000} + 90w + \frac{1.3657Dw}{2V}$$

In which c = the cost per stop in dollars for stopping and starting.
 V = miles per hour from which stopped and to which accelerated.
 T = tons in train including engine, tender and caboose.
 q = cost of coal per lb. in dollars.
 w = rate per second of wages for train and engine crew in dollars.
 D = distance in feet in which tons T are accelerated to speed V .

In the above the following assumptions are made:

That 4 lb. of fuel are used per horsepower hour.
 That 7 lb. of water are evaporated per lb. of coal.
 That water costs 15 cents per 1,000 gallons.
 That the train loses 1.5 min. in coming to a stop and releasing brakes over and above the time that would be used if the speed had not slackened.
 That the fuel required to move the train from the point where deceleration begins, to the point where acceleration ends, at the regular through freight speed V , would be required if no stop were made; therefore it should properly be deducted and not charged to the cost of the stop.

Substituting values as follows in the above:

$V = 25$
 $q = \$0.0015$
 $w = \$0.0006$
 $D = 3,000$

We have, $c = \$0.00144T + \0.058915 , whence the cost per ton per stop will be

$$C = \frac{\$0.00144T + \$0.058915}{T} \quad (2)$$

And for n stops over the district, the cost per ton will be

$$E = \frac{n(\$0.00144T + \$0.058915)}{T} \quad (3)$$

The first term within the parenthesis varies with the ton-

nage handled, while the second term is constant, and greater in value than the first term when the tonnage is less than about 409 tons. The value of E varies directly with the number of stops n , and inversely as the tons handled T .

The cost per ton handled by a way freight crew running over the district as a through freight would, of course, be the amount of the cost divided by the tons. The total cost per ton would then consist of this item plus item E to cover the cost of the stopping and starting that the way freight must perform over and above that required for straight through freight operation. In other words, total operating cost for train service, P , will be

$$P = (\text{through freight cost} + E) \text{ divided by the tons.}$$

For purpose of illustration, assume through freight cost at \$60 per day, then,

$$P = \frac{\$60.00 + n(\$0.00144T + \$0.058915)}{T} \quad (4)$$

Assuming further for purposes of illustration that the stops n , are 20, we have after substituting in above, the following table:

Tons handled, T	Cost per ton for train service, P
100	\$0.614663
250	.247593
500	.125237
750	.084451
1000	.064058

The values in the above table are plotted in the diagram, which shows graphically how the cost per ton handled is a rapidly decreasing function of the tonnage handled.

The first item in the numerator on the right side of equation 4, shown as \$60 above merely for purposes of illustration, should not be understood as a constant quantity. In reality it is a constant plus a variable—the minimum day's pay for the crew and the fuel necessary to take locomotive and caboose over the road, together with water, lubricants, etc., making up those items of expense which are entirely independent of tonnage handled, being the constant; and the increased expense for wages, fuel, etc., which varies with the tonnage handled, being the variable. In any particular case the correct values for this item would have to be determined from the records, or preferably from actual tests. The above formulae are not to be understood as scientifically accurate; their degree of accuracy is no greater than the accuracy of the assumptions upon which they are based. They are merely intended to indicate one way through which the problem may be considered, and it is to be hoped that others who have given the problem any study, and who may be better qualified to discuss it, may be induced to submit their views.

It will be noted that no account is taken of the time, fuel and other costs in connection with station switching, unloading and loading merchandise, etc., coming under the general head of station work. In any case, these costs would be the same regardless of the tonnage handled. They are constant and need not enter into a consideration of the problem other than to be classified as constant expenses and entirely independent of the tonnage handled in way freight trains over the district or sub-division.

RUSSIAN RAILWAY EQUIPMENT SCARCE.—Chief Traffic Manager Shubersky, in charge of Russian railway transportation along the front, has made a report to the Committee of Engineers of the Department of Communications in which he cites figures to show that at the end of the present half year there were 700,000 freight cars less than in the same period a year ago. At the beginning of 1917, said Mr. Shubersky, there were 34,000 broken locomotives, or 16½ per cent. of the total. Today there are 52,000, or 25 per cent. Similarly the cars out of commission were 25,000, or 4.8 per cent. against a present number of 46,000, or eight per cent.

MEETING OF NATIONAL INDUSTRIAL TRAFFIC LEAGUE

The National Industrial Traffic League held its summer meeting at the Hotel Statler, Buffalo, N. Y., on August 23 and 24. The attendance was good and the annual meeting was set for November 15 and 16 at New York City. In his opening address, G. M. Freer, president of the League, called attention to the patriotic necessity of shippers extending every effort to conserve the car supply regardless of what the carriers do or fail to do in that direction.

H. C. Barlow, chairman of the executive committee and now advisory member of the Car Service Division of the Interstate Commerce Commission, addressed the convention at length on the work of the new division. He believed that he had succeeded in large measure in impressing the members of the Commission on Car Service of the American Railway Association with the importance of the shippers' point of view in connection with problems of car supply. The work of the Car Service Division, he stated, is discharged largely through the Commission on Car Service, and he asked that shippers, taking up matters with either committee, send a copy of this correspondence to the other committee. He recommended that shippers route freight in such a way as to permit its diversion through other gateways when the gateways through which it has been routed are congested or embargoed. He believes that some sort of billing notation should be provided whereby the shipper may authorize the railroad to change the route of a car when destined to pass through an embargoed gateway or junction point provided that such a change does not interfere with the through rate. He does not believe that the plan of sailing days for I. C. L. freight, recently put into operation at Philadelphia, will prove successful. He pointed to the fact that the plan has been tried by the New York Central at Cleveland and abandoned. He also stated that it is the imperative duty of shippers to work individually and collectively in the interests of expedited car movement.

The report of the executive committee included opinions on the various recommendations of the Interstate Commerce Commission in its annual report to Congress. The committee expressed itself in favor of the Commission's recommendation No. 1: "That unless the recommendation No. 4 in this summary be followed, Section 15 of the Act to Regulate Commerce be so amended as to provide one period, limited to one year, for suspension of a schedule stating a new rate, fare, charge, classification, regulation or practice; and, if so amended, that Section 6 be so amended so as to provide for 60 days' notice of proposed increased charges." The committee was opposed to recommendation No. 4, which is as follows: "That by statute the Congress fix the interstate rates, fares, charges, classifications, rules and regulations existing at a specific date prior to that of enactment, as just and reasonable for the past, and provide that no change therein, after that specified date be made, except upon order of the Commission, with provision that such statute shall not affect proceedings pending at the time of enactment."

The committee expressed itself in favor of recommendation No. 5 and recounted the action it had taken in the interest of the passage of suitable legislation in Congress. This recommendation is "that if jurisdiction to award reparation remains with the commission (in lieu of the uniform three-year period recommended in our last annual report for the beginning of all actions relating to transportation charges, subject to the Act) the Congress fix a limit of three years within which a carrier subject to the Act to Regulate Commerce may bring action for recovery of any part of its charges, and amend Section 16 of the Act so as to provide that if the carrier begins such action after the expiration of the two-year limit now prescribed in that section, or within 90 days before such expiration, complaint against the carrier

for recovery of damages may be filed with the Commission within 90 days after such action shall have been begun by the carriers, and not after."

The committee favored the Commission's recommendation No. 9, that legislation upon the subject of control over railway capitalization be passed. The committee did not believe, however, that any scheme of federal incorporation of common carriers and federal regulation of the issuance of securities, should be adopted, which might put any moral or financial obligation on the government.

The report of the executive committee was adopted in full with the exception of that section dealing with the Commission's recommendation No. 6, namely, "that without abdication of any federal authority to finally control questions affecting interstate and foreign commerce, the Commission be authorized to co-operate with state commissions in efforts to reconcile upon a single record, the conflicts between the state and interstate rates." The committee did not favor this recommendation on the grounds that such a change in the law might postpone or prevent exclusive federal control of railway regulation. A motion was finally adopted, however, which provided for the appointment of a special committee to consider the recommendation further.

The League adopted the report of the committee on car demurrage and storage which was largely a history of changes in demurrage rules within the last six months and the action taken by the League in connection with those changes. The League expressed its approval of certain changes in the demurrage rules governing private cars which were proposed by the special committee on private cars.

The report of the express committee, which was adopted in full, emphasized the importance of better packing and marking of express shipments in relation to increased efficiency by express companies as well as a reduction in the number of claims against express companies.

The League adopted the report of the freight claim committee which pointed to the failure of some carriers to keep records of l. c. l. freight at transfer points and recommended the appointment of a special committee to take the matter up with the railroads.

The report of the legislative committee included a discussion of the law recently passed increasing the membership of the Interstate Commerce Commission and authorizing the Commission to form itself into divisions. Considerable consideration was given to Section 4 of this act which amends the Act to Regulate Commerce to provide that no increased rate, fare, charge or classification shall be filed, except after approval thereof has been secured from the Commission, such approval to be given with or without formal hearing at the discretion of the Commission. It was the general consensus of opinion that Section 4 did not substantially change the provisions of the commerce act and that if the Commission gave merely a perfunctory hearing in any given case the shipper could later secure a suspension until a full hearing had been granted.

The report of the committee on transportation instrumentalities was adopted in toto. The report mentioned in particular the League's opposition of long standing to the car service rules requiring the return to each railroad of its own box cars and restricting the movement and routing of such equipment. It was pointed out that these rules had been materially altered by an order of the Railroads' War Board on April 30, 1917, and that considerably more freedom in the movement of box car equipment had obtained.

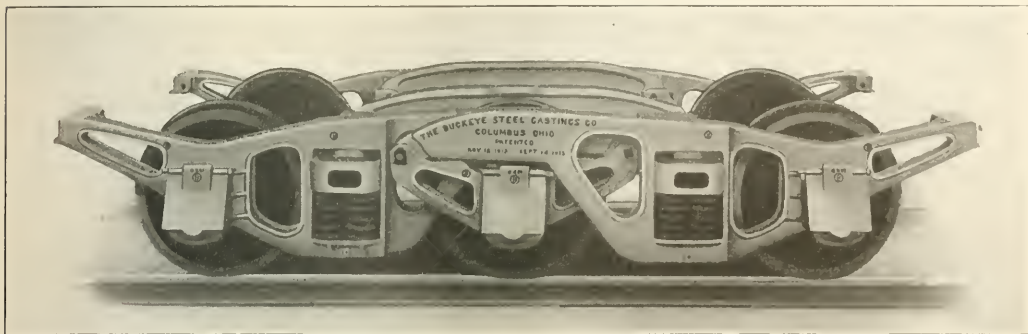
The special committee on railroad leases and side track agreements read a long report, which was adopted after some discussion. Attention was called to the general tendency of railroads to modify railroad leases and side track agreements to put all liability on the shipper. In view of this condition the committee urged the advantages of a uniform liability clause in all railroad leases and side track agreements.

Articulated Six-Wheel Freight Car Truck

Interesting Design Developed for Service Under an
Experimental 120-Ton Coal Car for the Virginian

A SIX-WHEEL truck design which contains a number of unusual features has been developed by the Buckeye Steel Castings Company, Columbus, Ohio, for use under one of the four 120-ton experimental steel cars recently placed in service on the Virginian Railway. Sample

Although these trucks possess a flexibility equal to that of equalized six-wheel passenger trucks, the design is such that the entire truck body is composed of parts which may be manufactured in large quantities by steel foundries, thereby facilitating the making of repairs with limited shop facilities.



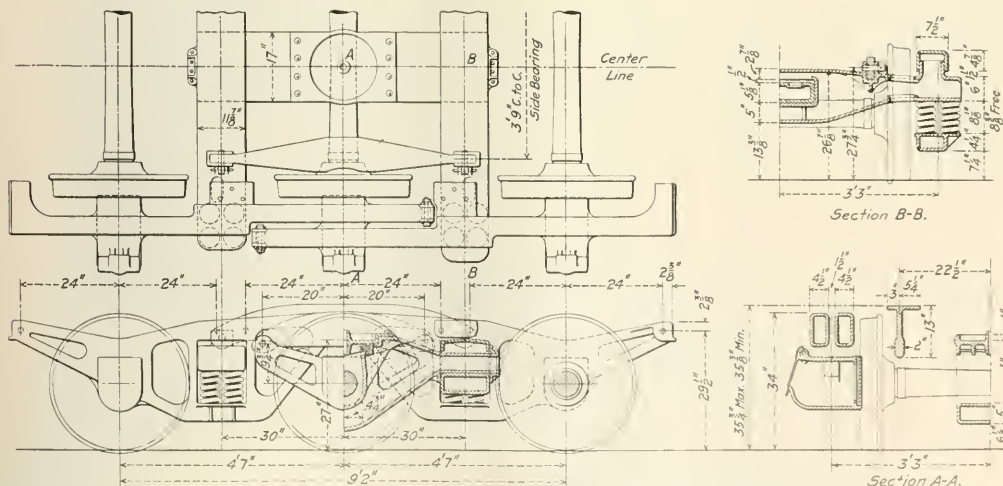
The Buckeye Six-Wheel Articulated Truck

trucks of a similar design, but for cars of 90 tons capacity, have been in operation since 1914 on the Norfolk & Western, and have given excellent service during their more than 50,000 miles of travel.

The car to which these trucks were applied was built by

The wheel base is 9 ft. 2 in., a short wheel base being particularly desirable for coal car service, in which uneven mine tracks with curves of small radius and steep inclines to unloading machines must be safely negotiated.

Each side frame consists of an outside and an inside



Plan, Elevation and Sections of the Buckeye Articulated Truck

the Cambria Steel Company, and has a rated capacity of 218,000 lb., or 120 tons, with a 10 per cent overload, and 4,265 cu. ft. The light weight of the car is 83,300 lb., of which 48,650 lb. is in the car body and 34,650 in the trucks. The ratio of revenue load to total load, with a 10 per cent overload, is thus 74.2 per cent.

frame, each with a 6-in. by 11-in. journal box cast integral. The middle journal boxes are cast with equalizer arms on either side, the ends of which are provided with pockets in which the ends of the side frames rest.

The equalizing of the cross bolster loads is thus entirely performed by the articulated side frames. By providing the

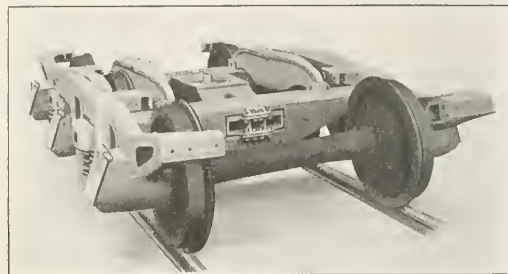
frames with elongated holes through which the equalizer bolts pass, a limited amount of forward and backward movement of the frames is allowed, thereby affording flexibility to the sides of the truck and enabling it to take comparatively short curves with no appreciable binding of the wheels. The location of the bolsters in the side frames is such that the distance between the point of loading and the center of the end journal is one-half of that between the point of

of vertical movement to provide for passing up and down steep inclines to coal docks, or in case of derailment to insure against excessive strains which might otherwise be imposed upon the castings.

The cross bolsters are cast with openings through which pass the ends of the center bolster. Sufficient clearance is provided to allow a limited movement of the center bolster, thereby adding to the flexibility of the truck and greatly facilitating the ease with which the bolsters adjust themselves to inequalities of loading. The side bearing bridges are arranged on the inside of the frames and are supported directly by the cross bolsters. Rectangular shaped boxes on top of each end of the cross bolsters fit into recesses in the top members of the side frames and serve as column guides.

The side frames and equalizers are of channel section, including the brake brackets at the end of the frames. The two inside frame castings on each truck are interchangeable, as are also the outside frames.

The trucks are equipped with a clasp brake of extra heavy pattern designed by the American Brake Company. All beams are hung from brackets cast integral with the side frames. The weight of the clasp brake rigging per car is 4,100 lb., leaving for the weight of the trucks alone 30,550 lb. The steel castings account for 14,580 lb. of this weight.



End View of the Truck, Showing the Longitudinal and Cross Bolster Connection

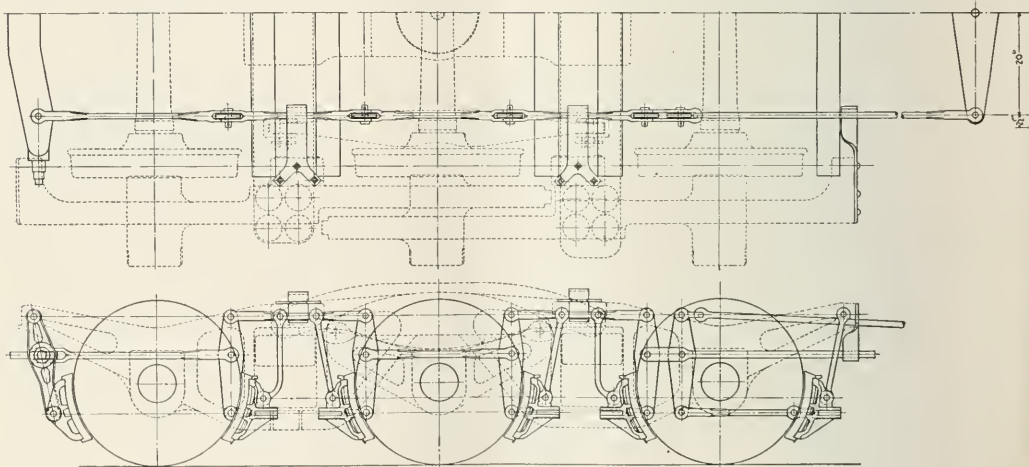
loading and the bearing point in the equalizer pocket. Any unbalanced load on one of the frames which causes an upward or downward movement of the equalizer arm, is immediately counteracted by a shortening or lengthening of the moment arm between the point of loading and the bearing point in the equalizer pocket, the contour of which is designed to compensate in this manner for variations and inequalities in loading. The equalizer bolts serve only to hold the side frames and equalizers in place, the load being

STANDARD CODE RULES 17 AND 90

By Harry W. Forman.

17. The headlight will be displayed to the front of every train by night, but must be concealed when a train turns out to meet another and has stopped clear of main track, or is standing to meet trains at the end of double track or at junctions.

If trainmen and enginemen always had to depend upon uninterpreted rules to determine just how to operate their trains, confusion would sometimes result, as many code rules are so abridged that much must be left to their judg-



Clasp Brake Rigging Applied to Buckeye Trucks under Virginian 120-Ton Coal Car

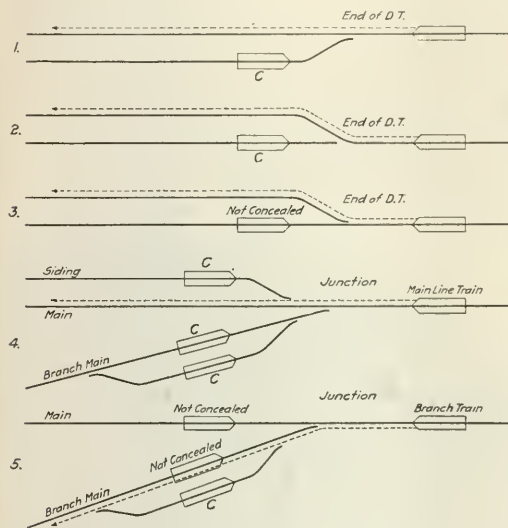
transmitted directly through the bearing between the castings.

The bolster is made up of three parts, i. e., one longitudinal center bolster and two cross bolsters. In order to keep within the low limit of 27 in. for the center bearing height, a unique type of longitudinal center bolster was developed. The bolster itself is dropped below the center axle. The center plate is removable and spans the axle. Ample clearance is provided between the center plate and the bolster member below the axle to allow the axle the necessary freedom

ment. Rule 17 does not mean that the headlight must always be concealed while standing at the end of double track, or at junctions. Whether or not an engineman should do so depends upon the position of the switch in front of his train. It should be a well grounded principle in safe railroading that a headlight must never be covered while a switch is so lined up that an approaching opposing train might, should its engineman miscalculate distance or lose control of his train, strike the waiting train.

Code rules do not require the train which is standing on the main track at a meeting point to adjust the switch so that the opposing train will run in on the siding, but this should be done, provided, of course, the train which holds the main track arrives in time and stops near the switch. In this situation, after the switch has been opened, the standing train should dim its headlight, if it be an electric or any other kind which is exceptionally brilliant, because, if not done, the engineman of the train which must take siding will find it extremely difficult to determine the position of the switch, or see any hand signals necessary to be given.

Under this interpretation of the rule, every engineman should understand that the fact that some other crew may turn the switch for him, does not relieve him from being prepared to stop in time to allow one of his trainmen to open



Management of Headlights at Meeting Points

Trains Marked C Have Headlight Concealed.

it. The crew of the standing train must be instructed not to give a "Come ahead" signal if there are any cars or trains on the siding. In fact they should, in such cases, give a slow-down, or a stop-signal. The diagrams below may help to make the intent of the rule clear.

90. (Fourth paragraph.) The engineman will give signal 14 n at least one mile before reaching a schedule meeting point with a train of the same or superior class, or at a point where by train order the train is to meet or wait for an opposing train. Should the engineman fail to give signal 14 n as herein prescribed, the conductor must take immediate action to stop the train.

The gentlemen who formulated Rule 90 may have wished to be understood as meaning, "Engineman will give signal 14 n one mile before reaching the entrance switch at the point beyond which his train must not go until the expiration of the time named in his train orders, or until the opposing train, or trains, for which his train is restricted, either by time-table or train order, shall have arrived. Should he fail to so signal, then the conductor must take immediate action to stop the train in time to prevent collision." But there is a good deal left out. If it be thought best to require enginemen to sound the whistle in a way that will assure their trainmen that train orders or opposing trains are not being overlooked, certainly this precaution should be taken in every case where one train must wait for another, without regard to whether such meeting point be by time-table or train order. The schedule meeting point is no more

important than any other. In practice, I am inclined to think that many enginemen do so whistle, notwithstanding the rule does not cover every case wherein they ought to whistle. Should the field be canvassed, it is probable that a slight majority of officers would vote to continue whistling meeting points; but not every railroad man who has had an opportunity to observe its workings is willing to concede the necessity of this so-called safeguard. So much whistling is not only a nuisance, but we are drifting toward a condition of mind where we do not regard the whistle as vital, having so often been misled; and we are not taking proper action to prevent a possible collision when there is a failure to whistle. Every division has its enginemen who whistle incorrectly and unnecessarily, and also those who use judgment in this particular. Those who confine the use of the whistle to actual cases of need get along as well as, if not better, than the others; and have no more accidents or misunderstandings than those enginemen who make a plaything of the whistle lever. I never take a trip extending over several different roads without returning more fully convinced than ever that the rule for the public crossing whistle should be changed to two long, one short and one very long, gradually-dying-out blast, this being a signal often heard. It is so entertaining to hear an engineman string out his whistle about four times longer than necessary, when one is trying to sleep. It is not that enginemen have not the proper appliances, or have not been most fully instructed; some are just bullheaded, or too ignorant to appreciate the value and satisfaction of accurate whistling. Every engineman who lives near the railroad devotes much of his time while off duty to showering imprecations upon his brother enginemen who deliberately indulge in such damnable practices while passing his house. This condition may be expected to continue until actual suspension is applied for this kind of carelessness, the same as is administered for other violations of rules.

Assuming that Nos. 1 and 2 are of the same class, No. 1 superior by direction, and that they are scheduled to meet at G, it is clear that only No. 2 would sound the meeting point (or restriction) whistle. If directed by train order to meet each other, or No. 1 be ordered to wait for No. 2, or No. 2 be given right over No. 1 to G, then both enginemen must sound this whistle.

Should No. 1 be instructed to run late, or wait at given stations until certain times for No. 2, the engineman of No. 2 must sound this whistle about one mile short of the station beyond which he must not move against No. 1. But No. 1 is not required to thus whistle, unless it finds that it is going to arrive at such station in advance of the time named, in which event it would seem to be proper for the engineman of this train also to whistle as per 14 n. It may be contended, however, that the effect of such an order is merely to change the time-table time of No. 1 by that much, and that therefore it should not whistle. Probably this view of the matter will eventually obtain. There is at present a difference of opinion as to this.

Should No. 2 be one hour late, No. 1 on time, and No. 2 be allowed to go to any station which it can make for No. 1 without train order help, it is clear that provision is not made in the rule for No. 2 to sound this meeting point whistle; though it is just as important that it do so, the same as in approaching the schedule meeting point. Watches sometimes go wrong.

There is much complaint about this signal not being distinctive. Often it is taken for a public crossing whistle if there is a crossing nearby. I have found that when two full seconds are allowed to elapse between each two blasts of the whistle it more surely attracts attention. It can be heard much better by the trainmen concerned. Try it. It is true that an unfortunate combination was selected. One long, a short and a long would have been better; or one long and one short.

A. C. SIGNALS ON THE SOUTHERN RAILWAY

When present contracts are completed the entire line of the Southern from Washington, D. C., to Atlanta, Ga., 640 miles, will be equipped with automatic block signals. A very thorough study of this problem was made before the first work was undertaken, with the result that the standards then adopted have been maintained without important changes for all the later installations. This line will be one of the longest in the country under the protection of a. c. signals, and the high degree of satisfaction rendered by the installation is convincing proof of the value of this system. The use of alternating current, supplied by a power line from a central station not only makes possible much longer track circuits, with the lessened expense for relays, and reduces by one half, or more, the maintenance force that would be required with direct current, produced by primary batteries at each signal; it also makes available other economies, such as electric lighting of signals and of passenger stations and the use of power for small motors at isolated locations; so

principally on account of the installation of passing sidings. The need arose in several cases for a special signal indication for use on ruling grades to permit full tonnage freight trains to pass a stop signal without first being brought to a stop. The form of indication adopted is a 15-inch yellow disk mounted to the right of the signal mast, 7 ft. 9 in. below the blade, in the center of which is displayed a letter G which is illuminated, when the signal is in the stop position, by an electric lamp mounted behind the disk. A tonnage train is permitted to pass a stop signal having this marker, at not over eight miles an hour, expecting to find the block occupied, a switch open or the track broken or obstructed.

No switch indicators are provided except at the junction of single and double track. The rules provide that an interval of two minutes must elapse after a switch leading to the main lines is opened before a movement can be made past the fouling point. This has worked out very satisfactorily, thus far.

The G. R. S. 2A signal mechanism with steel semaphore blades and two 12-volt 5-watt Mazda lamps have been used



Typical Signal Location Showing A. C. Line at the Right

that the cost of generating stations, which is the largest item of expense, beyond that of a direct current installation, is far outweighed; and beyond all questions of immediate economy there is the additional safety due to the use of relays which cannot be dangerously energized by foreign currents.

The first signals were put in service between Denim, N. C., and Charlotte in February and March, 1913. Successive sections were equipped as the work of double tracking was completed. In three cases short sections of "A. P. B." signaling were installed on single track, but two of these have been changed over to double track signaling and the third soon will be.

Preliminary study showed that for the existing traffic of 40 to 50 trains daily it would be most economical to adopt a standard block length of two miles, with the thought that intermediate signals could be installed when traffic justified, without disturbing the existing installation. This block length has been adhered to throughout, although in several cases the intermediate signals have already been required,

for all of the new work. The signal motors are 110-volt and in the first installation were of the series commutator type. Later developments, however, soon led to the substitution of induction motors, which are now used throughout. While the induction motor requires somewhat greater power, it operates the signal arm from zero to 90 deg. in the same time required by the series motor, seven seconds, and eliminates the weekly or semi-weekly cleaning which the earlier type required.

The 8½-in. wrought iron numbers used to designate the signals have repeatedly demonstrated their advantages. These numbers are painted white on the face and black on the back and are bolted to a wrought iron supporting bar which is attached to the pole with clamps. The numbers are distinctive in appearance, are easily painted and do not chip off or break.

A six-strand aluminum cable on a steel core was chosen for the three-phase, 4,400-volt transmission line on account of its greater conductivity, increased strength, lighter weight, ease of erection, and cheaper first cost, as compared with

No. 6 hard drawn copper. The first cost is the only one of these advantages which has changed since the first installation, and in spite of increases in price this material is still being used for the transmission line. Its strength has been repeatedly demonstrated in service on this line. In some cases trees have blown over on the aluminum wire without breaking it, and when the trees were cut down the wire has sprung back into place. The steel gains which were originally used on all poles, to obviate the necessity for crossarm braces and to preserve the strength of the pole, have been eliminated on account of the high cost of steel. It has been found that under present conditions it is cheaper to provide crossarm braces and to cut gains in the poles. The original line was built with 1/2-in. steel pins on the crossarms for the high tension line, but it has been found that the standard 1 1/4-in. locust wood pins used for the low tension line are fully as good, or better, for this high tension line, and of course are much cheaper.

The transmission line is sectionalized at intervals of about 5 miles, the switches in the first installation being immersed in oil. It developed in service, however, that this line carried such a small amperage that the oil switches could be dispensed with, and hook switches used instead. These switches are of the Westinghouse Type M, consisting of a copper bar mounted on vitrified porcelain attached to a cast iron pedestal. The porcelain supports are designed to withstand the voltage of the circuit without breaking down or puncturing. The switches are operated by a hook mounted upon the pole which engages in a hole in the switch blade. This enables the switches to be opened even when the circuit is alive if necessary.

The most important single cause of trouble with signals on this line is lightning. This territory is particularly subject to electrical storms at certain seasons and it has proved a very difficult matter to entirely eliminate disturbances in the signal system from this cause. It is not uncommon to hear those familiar with the maintenance of these signals remark that if it were not for the lightning "they wouldn't know they had any signals." Three distinct types of protection have been provided from the beginning, one in all low voltage circuits, another for transformer protection on the transmission line, and the third for the protection of power house apparatus. The 1-in. galvanized rods used for arrester ground have been salted and every known precaution has been taken to improve the quality of lightning protection, but in spite of all such precautions the problem cannot yet be said to have been satisfactorily solved.

The construction and maintenance of the signal system is under the direction of W. J. Eck, signal and electrical engineer.

COLLEGE GETS A SLEEPER. A Pullman sleeping car will be used next year to supplement the dormitory of Highland College, Highland, Kansas. It is a ten-section observation car, accommodating forty persons if two sleep in each bed, and has a reading room and a vestibule. Dealing, as they do, with students working their way through college, the trustees of the institution were hard pressed this spring when it was announced an addition to the dormitory would be needed next year to accommodate the increasing enrollment. The college had just finished raising a \$50,000 endowment fund, and more money for building a dormitory could not be had. Then President W. Gilbert James learned the Pullman Company had presented a Pullman car to a "self-help" college in the East, and he made application for a sleeping car for Highland. The request was granted, and the car has been started on its way here. A wrecking car crew will be sent here to move the car to the college campus. The car is old, of course, but it promises to fill adequately the need for which it is intended. It will become a permanent part of the school's equipment.—*Kansas City Star.*

PURCHASE AND MAINTENANCE OF LABOR ON RAILROADS

By E. Wanamaker

Electrical Engineer, Rock Island Lines.

Much has been said and written regarding the accomplishments of specialists, efficiency engineers, etc., who have devoted their time to the economic purchase of all kinds of materials, machinery, etc., and the maintenance and operation of such equipment. On many railroads the subject of fuel has been given close attention by specialists, often resulting in a marked reduction in the fuel bill which amounts to from 7 to 15 per cent of the total operating expenses. To obtain supervision that will secure an economic use of the fuel, large salaries are paid and a large staff of men is employed. Likewise, large salaries are paid to men who are familiar with the different equipments in use on the railroads as well as to the men who secure the economic installation of many materials entering into railway construction.

These are all important and worthy of the attention that has been given them, but inasmuch as nearly 50 per cent of the railroad dollar is expended for labor, it would seem that if there is one particular item on the railroad that justifies the employment of expert supervisors, it is the hiring of employees, or the purchase of labor, together with the matter of educating and caring for the workers, which might be called the maintenance of labor. It is a vast subject and today by far the most important with which the railroads have to deal. As a general rule, it requires far more ability to handle the men, who in turn handle the equipment and materials, than to choose the proper equipment and materials.

When an important machine, as, for instance, a large air compressor, is to be purchased, the engineers make careful and minute investigation requiring the service of a number of men several days, when the total cost of the compressor installed will not exceed \$20,000, and oftentimes when the difference in economy of operation of the several compressors considered would not lose the company more than \$500 or \$600 per year were the poorer one purchased. On the other hand, consider the case of a foreman employing four men. Their total wages for the year will probably amount to \$5,000, but due to ignorance or inefficiency they may during the year easily cost the company more than \$5,000. The purchase and care of labor has not been given nearly the attention that it should have received.

Labor, or laboring men have too often been looked upon as cogs or spokes in the wheel, when it should have been borne in mind that each and every individual has his own personality, his own feeling, his own indifference, or his own ambition. In the employment of labor, much attention should be given to the examination and questioning of the prospective employee by a man who is thoroughly competent to judge men. The employment of labor on railroad systems should be placed in the hands of an employment department made up of specially trained men in order that the proper kind of men for the various occupations be chosen at the start. Then these men should be followed up by the labor department in order to see that they are properly educated in their work, and also in all general matters that affect them in their relation to the company by which they are employed. It should be seen that the square man does not get into a round hole; that the employee is protected, and that faithful and competent service is properly rewarded. It is evident that inefficient labor in any organization holds down the flat rate for all, and whether or not labor contracts exist, individual effort and efficiency should be rewarded financially over and above the flat rate, which would be only the minimum. When individual effort is substantially rewarded, we will again see hearty and efficient co-operation between

labor and capital, with its resultant success, such as largely existed prior to the advent of the large corporation. In this way, the personal element will again come to the front, making it worth any man's while to put forth his best efforts in his work.

The writer has been termed, at different times, a sort of efficiency engineer or crank; however, it would seem that a competent efficiency engineer is only a good business man, who takes sufficient time to sit back and thoroughly study and investigate all phases and conditions of his business in order that he may change any practice that does not secure efficient and economical results. Constant association from boyhood with many classes of labor, and a close study of men, have convinced me that the method of rewarding labor outlined above is both efficient and just.

A labor department is fully as necessary an adjunct to a railroad as is the department for testing materials. The function of the labor department is different however. It would test the men, but go further than the department for testing materials and follow the welfare of the men and their relations with the company as long as they are connected with the service. The statement "that no manager is greater than his organization" holds true. The loyal support of each employee is necessary; likewise, loyalty of the manager and the company to the employees, if substantial and lasting success is to be attained. In order to secure good service from the men, it will be necessary for the company on its part to insure good service to the men by guaranteeing a fair compensation for work well done, and the continuity of employment for the deserving. Undoubtedly the welfare of the employee should be directly connected and to some extent proportionate to the welfare of the company.

The system used need not be bonus or piece work; however, it is probable that a combination of a fair flat rate, together with piece work, for some classes of labor, and bonus for other classes, would be the best method of rewarding individual effort and providing the proper incentive to secure good work. It would be well if free insurance for all employees was carried by the company, for officials as well as the rank and file. However, this benefit should accrue only to those who render good service. Pensions for disabled or superannuated employees might also be taken care of in a similar manner, or it would probably be better still to proceed on the basis that only those be retained in service who are good, honest workers. This would mean that eventually practically all employees in the service would be first-class in every respect.

The retention of unfaithful employees should not be tolerated. Under no condition should any labor organization be permitted to force unfaithful employees on any employer. Fair play must be assured by and between the employer and each and every class of employee, and faithful, efficient service rewarded by each side doing its very best to assist the other. This is practical from the standpoint of business efficiency—indeed, it is not only possible, but it is absolutely necessary for the good of all concerned.

There have been factories in which the overhead was unusually high, due to the fact that the machinery used and the buildings in which it was installed were very expensive, yet the entire plant was only in use 10 hours out of 24 and the overhead expense was a large proportionate part of the total cost of production. Would it not then be wise to have, in such cases, two eight-hour shifts per day securing 16 actual working hours out of the 24 instead of 10? Take the case of a factory turning out 100 pieces of machinery per day and producing all that was possible in the 10-hour day. If it was desired to turn out 200 pieces per day, it would be necessary to double the size of the plant. Now, if instead of duplicating the expensive machinery and buildings, two shifts were employed, working from 7 a. m. to 3 p. m. and from 3 p. m. to 11 p. m., the output could probably be dou-

bled without increasing the plant size and yet the working hours would, no doubt, be quite as conducive to the well-being of the employees. A case of this kind would only apply on the railroad to large shops where heavy repairs are made to motive power and rolling stock.

An employment bureau might well be formed on all our large railroads to be composed of the heads of the different departments; for instance, the general manager, superintendent of motive power, chief engineer, traffic manager, superintendent of dining car service, electrical engineer, superintendent of telegraph, etc. This organization should carry on its work through the superintendent of an employment and educational bureau whose relation to these officers would be analogous to the relation existing between the purchasing agent and the testing department. It would, no doubt, be necessary to organize a trained staff to follow up the educational and record work.

Due to the lack on most railroads of a method or system for educating employees, it is now becoming a difficult matter to secure competent help. Take, for example, the problem of obtaining competent section foremen. The class of track labor now generally employed does not, as a rule, furnish suitable material for making foremen, and yet the maintenance of track is constantly becoming more important and requiring more skill. An educational system for this class should be started now in order that the old section foreman, now being rapidly retired, can be successfully replaced.

Hand in hand with the proper method of rewarding and educating employees should go the elimination of the departmental viewpoint in so far as possible, meaning by this that although the employees of each department specialize on the work of that department and become expert therein they should also have a fair understanding of the work done by the other departments in order that all may co-operate to advantage instead of hampering each other. The working of one department without regard to the effect of its policy on other departments has often caused an organization as a whole to trip on its own feet.

It is just as necessary for a railroad to have its employees interested in all its departments, say, for instance, the traffic department, which sells the passenger and freight transportation, as it is for any successful merchant to have the hearty co-operation of his employees.

Last but not least, if the use of intoxicating liquors were stopped labor troubles would be greatly decreased and efficiency substantially increased.

INCREASED CAR MILEAGE ON THE EL PASO & SOUTHWESTERN

One of the best examples of improvement in the handling of railway equipment is afforded by the recent performance of the El Paso & Southwestern. For the month of May, 1917, the average miles made per car per day for system cars was 36.90 as compared with 31.64 one year ago and 27.56 in May, 1915, while the combined average of system and foreign cars was 49.17 miles per car per day this year as compared with 45.24 for the same month last year and 37.75 two years ago. Similar improvement has been shown in other months of this year as seen in the table:

		System	Foreign	Both
January,	1915.....	18.72	58.64	30.09
	1916.....	27.41	62.64	38.51
	1917.....	33.50	56.07	43.51
February,	1915.....	20.87	57.98	30.69
	1916.....	30.25	66.82	42.23
	1917.....	35.82	47.60	41.66
March,	1915.....	18.30	63.75	29.95
	1916.....	28.98	66.53	41.88
	1917.....	32.24	70.76	47.50
April,	1915.....	20.54	58.36	30.18
	1916.....	30.64	70.07	44.03
	1917.....	34.95	64.02	47.97
May,	1915.....	27.56	64.82	37.75
	1916.....	31.64	67.09	45.24
	1917.....	36.90	66.56	49.17

In January of this year the average miles made per day by freight locomotives over the entire system was 116.50 and in May 128.40. The same figures for passenger locomotives were 170.3 for January, 1917, and 172.69 for May. The average mileage of locomotives in non-revenue freight service in January was 106.80 and in May 91.34, while the mileage of switch engines was 79.19 and 73.44 respectively. The total average mileage per day per engine for all classes of service was 117.52 in January and 122.16 in May, an increase of 4.64 miles per day in the latter month.

IF I WERE PRESIDENT OF A RAILROAD

By B. B. B.

The real reason why the young college man does not enter railroad service is because of the uninviting future which the railroad work offers to him. If I were president of a railroad I would so operate it that it would command the attention of the better class of young men who are casting about for their future work. Some of the things I would do are:

I.—I would have a thorough check made of all the positions on the road, and fix an equitable salary commensurate with the work to be performed and the responsibility attached to each position. I would then employ men to fill the positions who were worth the salary paid. By doing this there would be no reason for working the men more than eight to ten hours a day during normal times, because with the salary commensurate with the position, it would not be difficult to secure men who could perform in eight to ten hours a day the duties which the men with less training must take 12 to 15 hours a day to do. To perfect this arrangement would require the best of judgment on the part of the persons fixing the salaries, because in adapting the salaries to the positions the questions of skill to perform the duties, and the responsibilities attached to the position would have to be the determining factors, instead of the amount of actual technical work connected therewith.

There are a great number of positions paying from \$75 to \$100 a month which require no skill or training, and very little responsibility, but require from 12 to 15 hours' work a day, when two men at \$50 a month could do the work without half the drudgery. Efficiency would be the watchword, and the highest efficiency can never be attained when persons have a lot of detail drudgery work which keeps them on the job for long hours each day, and who never know what it is to be caught up with their work.

II.—I would have an employment department, and place a competent man in charge of it—a man who knew men. This department would keep a personal record of all employees of the road, from the messenger boys up to the general manager, which record would consist of such information as to enable the department to determine the capabilities of the persons so employed. Accurate information would be furnished this department by the heads of the different departments of the road. When a position was vacant the matter would be taken up with the employment department and the employee who was most deserving and most competent, regardless of what department the vacancy occurred in, or in what department such employee was working, would be given an opportunity for the position. No outside man would be employed to fill any position if such vacancy could be filled by promoting some person already in the employ of the company. In making such promotions, of course, the duties of the position, the capabilities of the person to be promoted, etc., would all have to be taken into consideration. By this plan, every person who entered the service of the road would feel that he was in line for promotion from the moment he became connected with it. When it was necessary to employ outside men, I would, where

possible, employ college men. If they could not be obtained, I would then employ men who were desirous of bettering themselves, with the idea in view of educating and training them to fill more responsible positions, and not just filling the present vacancy.

I would have it thoroughly and distinctly understood that no salaries would be increased, but that all increases in salaries would be attained by promotion. With the salaries fixed commensurate with the positions, there would be no necessity for raising salaries, especially with the above employment and promotion plan in effect.

III.—After all expense of operation had been paid each year, I would deduct a sufficient amount from the net earnings of the company to pay six per cent on the total amount of money invested in the property of the railroads; this six per cent to be set aside to the stockholders—the balance of the net earnings would be divided fifty-fifty between employees and stockholders; the amount so set aside to the employees to be paid them pro rata according to the amount of yearly salary each employee received. With this plan the employees would feel that they were a part of the company; that if the company made money, they would get their share; and that if the company lost money, they would be losers with it. This plan would enable the company to secure the services of a better class of employees; would cause the employees to be more diligent and work harder both to prevent losses to the company, and to secure revenue producing business for the company; this would have the effect of increasing the efficiency of the employees to a degree never yet attained on any railroad in the United States—or anywhere else. I firmly believe that if the above plan were adopted that a saving of from six to fifteen per cent in operating expenses—and in many instances a great deal more—could be effected; and that the operating revenue would be considerably increased.

I believe that if the above were put into effect, it would not be very long until all troubles with the labor organizations would end. The general standard of employees would be raised, because a higher class of men would be attracted to the work; efficiency would be increased, because the employees would have some incentive for taking interest in their work, because they would feel that they were a part of the "company," instead of being a part of the "machinery" to run the company; the ratio of operating expense to operating revenue would be smaller, due to stopping the leaks on the one hand, and securing more business through all classes of employees on the other hand.

As the "railroad game" now stands, what inducement is there for a college trained young man—or any ambitious young man with a fair amount of education, and fair ability—to enter the railroad work as a life business, when other industries offer more favorable working hours, more favorable salaries, better opportunities for rapid advancement, and better social standing? The railroads are the arteries of American industry, and are entitled to the very highest class of men in their service, but the managements of the railroads have not kept pace with the managements of the other industries of the United States in the way of making the railway service attractive enough to secure the best class of men in its service. Other industries school and train their employees for their special work, while about the only training a young man gets in the railroad work is a "halling out" because he cannot handle it like an "old head"; and a young man who has spent his life up to the age of 25 years, and spent approximately ten thousand dollars to secure a college education does not care to spend ten to twenty years longer "coming up through the ranks" in order to reach a point where he can command a salary of from \$200 to \$300 a month, when there are so many different avenues of business which will land him far above this mark in one third the time.

INCREASED RATES TO OFFSET INCREASED EXPENSES

By W. W. Atterbury

Vice-President in Charge of Operation, Pennsylvania Railroad.*

It is hard to realize how rapidly the demands upon our railroads increase. Roughly speaking, traffic doubles about every ten or twelve years. The facilities of the railroads must grow with the traffic, or industry must slacken its pace.

In 1903 there was a great congestion of freight in the Pittsburgh district—the most severe ever known up to that time. Following that experience, great improvements were made in the railroad facilities here. At the time we were severely criticised for our seeming extravagance, as many thought the extensions then made were in advance of all possible demands for a half century. Yet here we are, after the lapse of only 14 years, face to face with a still greater congestion and the need for still more extensive and costly additions.

No one at all familiar with our national history needs to be told that from the time when railroads were first constructed they have been the dominant factor in the commercial development of this country, and in the settlement and opening up to civilization of its vast areas. We are, in truth, a railroad-made nation.

If you stop to think, I am sure you will also realize that railroad building and expansion, throughout our periods of growth and development, have always preceded and not followed the processes of our commercial and agricultural development, and the outspreading of our population. The railroads, indeed, have been the pathfinders and pioneers.

This condition has held true until within a comparatively few years—let us say about a decade. In this latter period, railroad development, as the result of the causes to which I have referred, has been slowing down and today has practically ceased.

Meanwhile, however, our industries, under the spur of individual enterprise, untrammelled by artificial restraints, have pushed forward, until we have now reached the position in this country of producing faster than we can distribute and exchange. I do not see how it is possible to escape the conclusion that unless the way is soon opened to permit our railroads to resume a normal rate of growth, the commercial development of the United States must shortly also cease.

This is a serious situation. It carries the threat of idle mills, idle men and idle machinery; nevertheless we are face to face with it and we might just as well understand it.

Now, what has been the effect of inadequate revenue? What fundamental error has imposed this needless check upon our national growth and prosperity? It must, in the final analysis, be attributed to failure to appreciate a simple truth.

In physics and in chemistry we all know it is impossible to make something out of nothing. It is a pity that, as a people, we do not also realize that it is as impossible in the field of economics. In the realm of business this truth means that every desirable thing must be paid for, in some way. Let me say most emphatically that this applies in the highest degree to railroad service. If you want adequate, prompt and certain service, you must pay for it, and any one who tells you that it can be gotten without being paid for is imposing on your credulity.

The erroneous idea that shippers, passengers, labor, equipment makers and material dealers can go on indefinitely getting constantly more and more out of the railroads, without any one having to pay for it all, has found concrete expression in vicious regulation and legislation. Its object has

been to punish; its effect has been to maim and destroy. Constructive development of the transportation system has almost been lost sight of, and possibly it would still be hidden by fogs and obscurities of two-cent passenger fare laws, extra-crew acts, wage-increasing statutes, and other enactments and measures having for their purpose getting more and giving less, had not the events of the last two years, and particularly the international situation, awakened the country. The railroads have been compelled to obey these laws, every one of which adds to the cost of rendering railroad service, and have been expected to do so without adding anything to the price received for the service.

Pressure has been constant to force rates down still lower, in the face of rising costs. Surely it is a matter of common sense that this process cannot go on indefinitely. Unless I am much mistaken, the limit has now been reached, so far as the railroads, in general, are concerned.

Is it any wonder, then, in view of the narrowing margin between railroad receipts and expenses, that the New York Central Railroad, one of the great transportation properties of the country, recently failed in the effort to sell \$25,000,000 of stock at par, or that the Erie Railroad and Southern Railway failed in their attempts to work out comprehensive financing schemes?

In 1916, the only railroad stock issued on the New York Stock Exchange, for new construction, was \$351,145.65, issued by the Cleveland & Pittsburgh Railroad for a small amount of work done in 1915—and even that stock was guaranteed by the Pennsylvania Railroad.

Last year, in fact, was the first year in which not a single share of new railroad common stock was listed on the New York Stock Exchange, in which the public took the chance of the investment of money for new railroad building in the United States proving sound. These are not pleasant facts, but you cannot ignore them. They are of profound importance to the shippers of this country. You know what it means to be short of facilities. You appreciate now how intimately the normal processes of our national life are dependent upon adequate railroad facilities. The one thing staring you in the face whichever way you turned was, that the railroads are swamped with business which they haven't the facilities to handle properly. The lines haven't the terminal facilities; they haven't the power; many have not the cars to handle properly the business that has been forced upon them during the past year.

There is but one remedy for the problem of the railroads, and that is to allow them higher rates—rates commensurate with the cost of rendering service and with the added demands that are daily imposed upon the carriers.

It is to the best interests of shippers and the general public alike that railroad rates be advanced. What the public most needs, is adequate service.

Paradoxical as it may seem, an advance in freight rates would lower the cost of living, rather than raise it. Will one of you question the statement that the price of food products, fuel, supplies, etc., has been materially increased through the local shortage of equipment, or our inability to move? Had rates been high enough in the last few years to have permitted the additional railroad improvements that you all now recognize are so badly needed, foods, fuel and other necessities would now be moving to market freely, in greater quantity, and the normal law of supply and demand would not be upset by a failure of transportation.

In short, freight rates play such a small part in the cost of nearly all the daily necessities of life, that an advance would, if apparent at all, be offset by normal supply.

On the other hand, the efficiency of the railroads would be so greatly increased that the ultimate effect might well be a general lowering of prices as a result of the improved machinery of distribution and exchange that the country would possess.

*From an address delivered at the 15th annual dinner of The Traffic Club of Pittsburgh on March 29, 1917.

General News Department

The Interstate Commerce Commission, Division of Valuation, has issued specifications in pamphlet form for maps, charts and schedules of telegraph and telephone properties owned by railroads, telegraph, cable and telephone companies, effective August 1, 1917. These specifications describe in detail the character of the maps desired, the manner of their preparation and other requirements for guidance in their preparation for filing with the division of valuation.

The Senate has recently passed a bill, S. 2718, appropriating \$100,000, to be expended by the Postmaster General in conducting experiments in the operation of motor truck routes in the vicinity of such cities of the United States as he shall select, for the purpose of promoting the conservation of food products, and to facilitate the collection and delivery thereof from producer to consumer. The Postmaster General is to report the results of his experiments to Congress.

An agreement embodying the final details of the settlement of the wage controversy between the southeastern railways and their shop employees was signed on August 24. The principal terms of the settlement, which were published in the *Railway Age Gazette* of August 10, were decided by Secretary Wilson of the Department of Labor, and include an eight-hour day for most of the employees, together with increases in wages, which altogether, it is estimated, will cost the railways about \$8,000,000 a year.

Despite unusual operating conditions caused by the enormous movement of materials and supplies to the army camps, the Nashville, Chattanooga & St. Louis made an excellent record in the operation of freight trains during the month of July. The average daily running time of the principal freight schedules operated by the line were as follows: Southbound (Chicago connection), Martin, Tenn., to Atlanta, Ga., 24 hours, 55 minutes; southbound (St. Louis connection), Martin to Atlanta, 25 hours, 8 minutes; northbound (Atlanta to Martin), 25 hours, 19 minutes. The distance from Martin to Atlanta is 431 miles, and the average running time, including stops, was 17 miles an hour.

General Manager George W. Stevens, of the Chesapeake & Ohio, has issued to employees a circular calling attention to the curtailment of passenger train service and the attendant inconvenience to the traveling public and reminding them that every passenger is, in a sense, a guest of the company; and expressing the hope that "every employee will recognize the fact that he is a representative of the host, and when off duty traveling on free transportation, if he is seated, and paying passengers are compelled to stand, will recognize the obligation due from a courteous host to his guest, and will quietly arise without attracting undue attention to his action, and make room for the paying passenger."

The Order of Railway Telegraphers has agreed to arbitrate, under the Erdman act, a pending wage dispute with the Chicago, Rock Island & Pacific. The Rock Island has selected as its arbitrators E. S. Jonett, general attorney of the Louisville & Nashville, Louisville, Ky., and C. W. Jones, general manager of the Rock Island at Des Moines, Iowa. The union has selected two arbitrators to represent its interests, and it is now in conference with the management of the Rock Island for the purpose of selecting two neutral arbitrators. The men demanded a 20 per cent cash increase in pay, an eight-hour day, various adjustments in the rules and certain vacation privileges. If their demands were granted in full the yearly telegraph payroll of the Rock Island would be increased by about \$700,000.

At the recent annual meeting of the American Society for Testing Materials it was decided that the tentative standards shall be published in the proceedings as heretofore, and the executive committee was requested to take such action as it saw fit with regard to their separate publication. In accordance with this action the executive committee has decided that, in addition to the publication of the tentative standards as Part

1 of the proceedings, they will be reprinted in a separate pamphlet in a paper binding. Each of the standards will also be reprinted separately so that those who desire copies of individual standards can secure them in that form. The paper-bound book for 1917 will comprise about 325 pages, and in addition to the 60 tentative standards will contain the complete list of standards and tentative standards of the society, with a suitable index. The price of this publication has been fixed at \$2 for members and \$3 for non-members. The volume is expected to be available about October 15.

W. H. Chandler, manager of the Transportation Bureau of the Boston Chamber of Commerce, has written an article complaining that in the matter of freight car shortage the railroads take too little upon themselves and endeavor to throw too much burden upon shippers and consignees; and he says that the records of 664 cars received in New England show that the average time of these cars from western points to destination was 34.7 days. One car came through in six days, and one was in transit 95 days. The average time from Peoria was 48.2 days; from other Illinois points, 44 days; from Milwaukee, 50 days; from Mississippi River crossings, 64.9 days; from Minneapolis, 57.5 days.

French Railroads in Fine Trim

Secretary of War Baker in a recently issued statement has denied that there was any basis of fact for a published statement that the railroads in France had fallen into such a state of disrepair that it had become necessary for American engineers to be sent to France to take charge of their restoration. On the contrary, said Mr. Baker, all his information indicated that the commercial railroads of France were in astonishingly good condition. The nine American engineer regiments that have been sent to France, he said, were to be used in reconstruction and maintenance of military lines.

Judge Lovett Member of Purchasing Commission for Allies

W. G. McAdoo, Secretary of the Treasury, has announced the appointment of Bernard M. Baruch, Robert S. Lovett and Robert S. Brookings, members of the War Industries Board of the Council of National Defense, as members of a purchasing commission to handle all purchases for the allied British, French and Russian governments in the United States. It is expected that the other allied governments may also place their purchases in the hands of this commission. Judge Lovett is also the administrative officer, who, acting for the President, has power to give direction for priority in transportation of certain kinds or classes of freight, as may be made necessary by war conditions.

Delays in Repairing Freight Cars

Fairfax Harrison, chairman of the executive committee of the A. R. A. committee on national defense, has issued a circular, "Bulletin No. 27," calling the attention of railroad managers to the large amount of unnecessary delay in repairing foreign freight cars. When a railroad car shop repairs a freight car belonging to another road, and has to send to that other road for material, it has to bear not only the cost of the per diem charge on the car while it is waiting, but also the loss of the car in service; and in the present scarcity of cars this is a serious item. One large railroad found that there was an average delay of 14 days, from the date of its orders for material from owners, to be used on foreign cars, to the date the material was shipped; and a further delay of 31 days (average) from the time the material was shipped until it was received. These figures, very likely, may show the general average throughout the country.

Attention is called to the fact that the Master Car Builders'

rules permit the use of unstandard parts under certain conditions, provided the car can be made safe and serviceable; and the association has recommended and urged members to take advantage of this provision of the rules. Where it is necessary to use metal holsters, large castings or other parts for which non-standard material cannot be substituted, car owners should take care to ship material with the utmost promptness.

Nine Hundred Twenty Miles on the Wing

Captain Giulio Laureani, an aviator in the Italian army, on August 28 flew from Turin to Naples and return, a distance of about 920 miles, without a stop. He left Turin at 10.07 a. m., reached Naples, flew over that city, and was back in Turin at 8.40 p. m., making an average speed of about 87 miles an hour. The previous long-distance non-stop record was held by Antoine Marchal, a French aviator, 807 miles. Miss Ruth Law flew 590 miles from Chicago to Hornell, N. Y., on November 19, 1916.

Railway Engineers in Battle with Submarine

Letters from members of the Rock Island and Illinois Central companies of the Thirteenth Engineers (Railway) United States Army indicate that the vessel which carried them to Europe had a lively battle with a German submarine shortly after the war zone was entered. In a letter to A. C. Ridgway, vice-president of the Chicago, Rock Island & Pacific, V. H. Hagelbarger, captain of the Rock Island company, wrote in part:

"Our trip so far has been uneventful except yesterday morning when we had a brush with a German submarine, but succeeded in getting away unharmed, although the skirmish was rather lively while it lasted. The men all behaved with the best of order and we were afterwards patrolled by two British destroyers, finding ourselves this morning at anchor waiting for orders."

A letter received by a relative of another member of the Rock Island company described the battle in greater detail: "Sunday at 7 A. M. a 6-in. gun was fired, followed by a 4-in. gun. I did not think of the danger we were in until a shot hit the water about 20 ft. from the left side of the boat. It was a submarine firing at us from the rear. Some of the boys claim they saw the U-boat, but the submarine was too far for me to see with the naked eye. I did see the flash from her guns, but could not hear a report. You can imagine, she was pretty far away. One of the gunners claimed that three shots went over the ship between the funnels and the bridge. The captain sent out a wireless for help and telephoned to the engine room for more speed ahead. The fight lasted 34 minutes, and during that time our gunners fired 34 shots. The 'sub' evidently fired more, for the shots hit the water all around us. At 9 and 9.15 we passed two English ships with one gun each on the stern and signalled them of the danger ahead. Between 11.30 and 12 o'clock we picked up a wireless message that one ship was sunk, but the other got away from the submarine."

Report on Collision at Irving, W. Va.

The Interstate Commerce Commission has issued a report, dated July 6, on the collision which occurred May 22 on the Baltimore & Ohio, near Irving, W. Va., between Wallace and Dola, where one employee was killed and four were injured. The collision was between a wrecking train moving east (after having attended to a derailed car), and a freight train moving west, and was due to carelessness in giving or in executing an order about flagging. The conductor of the wrecking train had sent a flagman from Dola by a preceding train, with orders, he says, to hold the westbound freight at Irving; but the freight was not held and the flagman claims that the order which he carried did not require him to hold it. The flagman held a paper containing the conductor's second instructions; but the conductor claims that a third paper had been issued. This the flagman says he did not receive. The inspector is unable to settle the question of veracity between these two men.

None of the instructions prepared by the conductor were read aloud either by the conductor or the flagman, and in issuing new instructions the former ones were not destroyed. The engineman and the pilot of the wrecking train are censured for not taking an interest in what was going on; they might have prevented the error or errors that were made.

In connection with the investigation it was found that employees were engaged under very lax methods of examination and instruction. Men were employed for train service by a trainmaster's clerk, who had himself never been examined on the rules; and the examination was very perfunctory.

The Railroads, the Public, Legislatures and the Labor Unions

[From the New York Times]

There never was such a volume of railway business moved as is moving now. There never was such a low average rate charged for the business done, in the face of rising costs surpassing all comparisons. The railways' profit is not the smallest ever known, for there have been times when railways went into receiverships by the billion dollars, but the profit is moderate compared with other profits. The mobilization of the army will be accomplished without much disturbance of the public comfort. When similar efforts are made by the railways abroad, the railways are closed to the public, in some cases for six days in a week. That inconvenience is borne because it must be. The railways propose to keep a record of their extraordinary doings and of the co-operation of the public. It will be an interesting record, and as interesting for its omissions as for its inclusions. For example, nothing will be said of the railways' indebtedness to the Governor of Pennsylvania for his veto of the repeal of the full crew bill, nor of the services of the legislature of this state [New York] in not passing a similar repealer. Twenty states have laws compelling the useless employment of 20,000 men, but there are no signs of repeal. The opposition of the unions is already registered.

The purpose of these remarks is to call attention to the fact that there is general co-operation with the railways, except by the lawmakers and the unions. The lawmakers, state and federal, show no signs of having outgrown their hostility to the railways. The unions, of course, regard the railways' difficulty as their opportunity, and will not waive their advantage for any consideration of the public good. In that the unions of this country are not singular. The cable reports the selection of the present moment to strike for the eight-hour day in England.

Prevent Fire

A patriotic duty of every American is to prevent fire, says a bulletin recently issued with the approval of the National Board of Fire Underwriters, and endorsed by the Council of National Defense. The bulletin is of interest to railway men as well as those in other lines of industries. The bulletin follows:

America at war needs every ounce of her energy and resources. It is criminal to cause hazards; it is unpatriotic to neglect them.

Here are some of the ways in which you can help:

1. Learn the factory safety rules and observe them.
2. If you discover a fire, give the alarm promptly. Do you know how to do this? Ask to be shown.
3. Don't smoke where it is not permitted.
4. Never drop a lighted match, cigar or cigarette; be sure that it has no spark left before throwing it away.
5. Report suspicious strangers seen about the plant.
6. If you notice any unusual smoke, the overheating of any machine, or any other accident, notify the foreman at once.
7. Carry your precautions into your own home; keep your house and yard free from rubbish, and help others to do the same.

Where would your job be if this plant should burn?

Help Uncle Sam. BE CAREFUL.

Railroading in Time of War

The Atchison, Topeka & Santa Fe recently sent out 125,000 letters to employees and patrons outlining the Herculean task of taking care of the country's unprecedented transportation needs and the importance of energetic co-operation by all concerned to bring about the highest efficiency possible. The circular points out that the railways were the first forces in the United States to volunteer their services to the Government for the world war and early merged their individual and competitive activities, placing them under the control of a committee of five railway executives, designated the Railroad War Board. "The War Board, as a result of the unity of action on the part of the carriers, has brought into use every available freight car in the

United States. Once a week there is a redistribution of cars among the lines which need them the most, regardless of ownership, thus eliminating waste. This has helped materially in increasing the efficiency of the service. On May 1, the country was short 140,000 cars. On August 1, the shortage had been reduced to 33,776 cars. The Santa Fe on its own lines will contribute to a further reduction of the car shortage by the purchase of 3,900 new freight cars, 55 new passenger cars and 60 new locomotives at a cost of approximately \$12,000,000. Nearly all of this equipment should have been delivered, but the Santa Fe has subordinated its rights and the manufacturers are using the men and material on Government orders."

The letter commends the co-operation of shippers, making possible heavier loading of cars and a reduction in the time of loading and unloading, and concludes: "The volume of Government traffic is the heaviest ever offered, and the fact should be known that the carriers are required to handle it at about half the price paid by other patrons for the same class of service. As a public service corporation the Santa Fe has a two-fold duty to perform—to help win the war abroad, and to continue to help build up the country at home, for use after the war is over. If the exigencies of the Government require it, the entire facilities of the Santa Fe will be devoted to the service of the Government, even to the extent of cancelling all trains now serving the public; but the most resourceful prophet, looking into the future, can see no such situation. The transportation of more than 100,000 cars of material for army cantonnments and the national guard camps, now in progress over the several railways, without interfering with the regular movement of traffic, is the best evidence that the carriers can discharge the duty devolving upon them in any emergency by which they may be confronted."

President Fixes Anthracite Coal Prices

Government control of the coal industry, under the terms of the food and fuel control law, was further extended on August 23 when President Wilson appointed Dr. H. A. Garfield, president of Williams College, as fuel administrator, and also announced a schedule of prices for anthracite coal, at the mines; this in addition to the prices for bituminous coal announced on August 21, and given in the *Railway Age Gazette* last week, page 355. Regulations governing the distribution of coal, which may include a regulation of the profits of retailers, are to be issued later by the fuel administrator, and a licensing system may be adopted. The margin of profit for jobbers was fixed in the President's order. Under the law the government may take over and operate any mine failing to observe the prescribed regulations. The price-fixing order provides that, effective September 1, 1917, the maximum prices per ton of 2,240 lb. on board cars at the mines for the grades and sizes of anthracite coal specified shall not exceed the prices indicated, when such coal is produced and sold by the Philadelphia & Reading Coal & Iron Company, Lehigh Coal & Navigation Company, Lehigh & Wilkes-Barre Coal Company, Hudson Coal Company, Delaware & Hudson Company, Scranton Coal Company, Lehigh Valley Coal Company, Coxie Brothers & Co., Pennsylvania Coal Company, Hillside Coal & Iron Company; Delaware, Lackawanna & Western Railroad; Delaware, Lackawanna & Western Coal Company; Susquehanna Coal Company, Susquehanna Colliers Company, Lytle Coal Company, or the M. A. Hanna Coal Company.

The grades and sizes for which the maximum prices are specified are as follows:

WHITE ASH GRADE			
Broken	\$4.55	Chestnut	\$4.80
ERR	4.45	Pea	4.00
Stove	4.70		
RED ASH GRADE			
Broken	\$4.75	Chestnut	\$4.90
ERR	4.65	Pea	4.10
Stove	4.90		
LYKEN'S VALLEY GRADE			
Broken	\$5.00	Chestnut	\$5.30
ERR	4.90	Pea	4.35
Stove	5.30		

Producers of anthracite coal who are not specified shall not sell the various grades and sizes of anthracite coal at prices that exceed by more than 75 cents per ton of 2,240 pounds, free on board cars at the mines, the prices enumerated; provided, that any producer of anthracite coal who incurs the expense of

rescreening it at Atlantic or lake ports for shipment by water may increase the price thereof by not more than 5 cents per ton of 2,240 pounds.

Producers named shall not sell anthracite coal to producers of anthracite coal not specified.

Dealers and selling agents shall not sell coal produced by the producers named on the basis of the prices fixed at the mine for coal produced by the producers not specified.

The prices fixed are based on investigations as to the cost of production conducted by the Federal Trade Commission, which has also been conducting investigations as to the cost of iron and steel, lumber and other commodities, with a view to further regulations. They are approximately the same as have been charged by the companies after conferences with the trade commission.

Railway Signal Association

The business of the annual meeting of this association, to be held at Atlantic City, September 18 and 19, consists wholly of the discussion of reports of committees, which reports have already been tentatively presented at previous meetings, and most of which now contain recommendations for final action by letter ballot. The first committee to be heard is the special committee on harmonizing of specifications, and the others are to be heard in the following order: Committee No. 2, mechanical interlocking; No. 3, power interlocking; No. 6, standard design; No. 10, storage battery; No. 1, signaling practice; No. 7, direct current relays; No. 8, electric railways and alternating current signaling; special committee on electrical testing; No. 5, maintenance and operation; special committee on lightning protection.

Committee No. 1 does not recommend any definite action at the present time. Committee No. 2 reports on field construction of pipe lines, and on locking switches mechanically at interlocking plants. Committee No. 3 presents a specification for petroleum asphaltum. Committee No. 5 presents a set of instructions for maintenance of alkaline storage batteries. Committee No. 6 presents 26 drawings, 7 of which are new designs, and also a specification for hand lantern globes. Committee No. 7 will present matter concerning the resistance of track relays as set forth in the Journal for March and for May; also a table showing minimum safe resistance between battery and track. Committee No. 8 will present five unit specifications, which were discussed at the June meeting; also descriptions of a number of installations of alternating current signaling. Committee No. 10 will present a specification for lead type stationary storage battery for signaling; general specifications for switchboard, and a drawing of a thermometer. The committee on harmonizing specifications will present a revised statement of the matter which has been discussed at the previous meetings this year, and will propose that the harmonized sections and paragraphs be approved for reference to letter ballot. The committee on lightning protection will present a specification for made ground apparatus. The committee on electrical testing will present a specification for ranges and scales for direct current electrical instruments; a track circuit chart and a ballast and rail resistance test chart.

Association of American Railway Accounting Officers

The secretary of the Association of American Railway Accounting Officers has recently announced that the next meeting of the association will be held at the Congress hotel, Chicago, on September 26.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the *Railway Age Gazette* for each month.

- AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. 16-17, St. Louis.
- AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 16-18, 1917, Chicago.
- AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 230 W. 57th St., New York.
- ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—E. R. Woodson, Rooms 1116-8 Woodward Bldg., Washington, D. C. Next meeting, September 26, Congress Hotel, Chicago.

ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Semi-annual meeting with Master Car Builders' Association.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—Willis H. Failing, Terminal Station, Central of New Jersey, Jersey City, N. J.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—W. L. Connelly, Supt. of Telegraph, Indiana Harbor Belt, Gibson, Ind. Next annual meeting to have been held September 18, 1917, Washington, D. C., indefinitely postponed.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—W. R. McMunn, New York Central, Albany, N. Y. Next convention, September, 1917, St. Louis.

CINCINNATI RAILWAY CLUB.—H. Bonhet, Chief Interchange Inspector, Cin'ti Ry., 101 Carey Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 568 Union Arcade Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

INVESTMENT BANKERS' ASSOCIATION OF AMERICA.—Frederick R. Fenton, 11 W. Monroe St., Chicago. Annual convention, October 1-3, 1917, Baltimore, Md.

MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES OF CANADA.—F. W. Ilager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 16-18, 1917, Cleveland, Ohio.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—A. P. Dabe, B. & M., Reading, Mass. Next annual meeting, September 11, Chicago.

NATIONAL ASSOCIATION OF RAILWAY COMMISSIONERS.—Jas. B. Walker, 120 Broadway, New York. Next annual convention, October 16, 1917, Washington, D. C.

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

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meetings, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Geo. A. J. Hochgrebe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PACIFIC RAILWAY CLUB.—W. S. Wollner, Assistant to Chief Engineer, Northwestern Pacific R. R., San Francisco, Cal.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple, Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

PAULWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial-Annex Hotel, Pittsburgh.

RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, office of the president's assistant, Seaboard Air Line, Norfolk, Va. Next meeting, October 2-4, 1917, St. Louis, Mo.

RAILWAY REAL ESTATE ASSOCIATION.—R. H. Morrison, Assistant Engineer, C. & O., Richmond, Va. Next convention, October, 1917, Duluth, Minn.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next annual convention, September 18-19, 1917, Hotel Traymore, Atlantic City, N. J.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September 18-21, 1917, Hotel Auditorium, Chicago.

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

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—J. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.

TRAFFIC CLUB OF CHICAGO.—W. D. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK.—A. C. Swope, 291 Broadway, New York. Regular meetings, 1st Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Gen'l Ag't, Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings bi-monthly, Pittsburgh.

UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

WESTERN CANADA RAILWAY CLUB.—L. Kon. Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Shelman, Chicago.

WESTERN SOCIETY OF ENGINEERS.—Edgar S. Nethercut, Acting Secretary, 1735 Monadnock Block, Chicago, Ill. Regular meeting, first Monday in month, except January, July and August. Extra meetings generally on other Monday evenings except in July and August.

Traffic News

F. A. Lallier, hitherto connected with the Houston (Texas) Chamber of Commerce, has been appointed traffic manager of the Galveston Commercial Association.

The railroads of Wisconsin filed an application before the Railroad Commission of that state on August 16, asking for authority to make an increase of 15 cents a ton in coal and coke rates.

The New York, New Haven & Hartford has filed with the Public Utilities Commission of Rhode Island a proposal to increase local freight rates applying on shipments within that state 15 per cent.

The State Public Utilities Commission of Illinois will hold a hearing at Chicago on September 4 to consider the application of the railroads for a reduction of free time to be allowed for loading and unloading open top cars from 48 hours to 24 hours, and the abolition of free time in connection with the reconsignment of such cars.

The Public Service Commission of Indiana, the State Public Utilities Commission of Illinois and the Public Utilities Commission of Ohio, held a joint conference at Indianapolis, Ind., on August 23, to consider the application of the railroads for an increase of 15 cents a ton in freight rates on coal and coke. No joint action by these commissions will follow this conference, but each will issue separate orders on the basis of the evidence presented before each commission. It was also decided at the conference to appoint a committee composed of one member of each commission to discuss class and commodity rates, other than those covering coal and coke, where there appears to be discrimination as between the various states.

Car Conservation in the Concrete

Penick & Ford, of New Orleans, wholesale dealers in molasses, are reputed to be pioneers in double loading of freight cars, and in the month of May last their average carload was 9,706 lb., or 20 per cent, heavier than in May, 1916; and this means the average per shipment, not the average per car. "Double loading," as most of our readers know, means to make one actual carload out of two "carloads" as defined by the freight classification. For example, the tariff may say that the carload rate applies to any shipment of 20 tons or over; but if the car which is provided for the load will hold 40 tons, and if there are two shipments of 20 tons each, destined to the same point, the shipper can put the whole into a single car.

The increase above noted marks the culmination of a fine record in this respect at Penick & Ford's establishment since the beginning of this year. This concern also has made a marked improvement in the prompt loading and unloading of cars; and the firm's traffic manager has issued a circular, printed in red, white and blue, giving some of the figures. In January, 1917, 93 per cent of the cars loaded or unloaded were released before the expiration of free time; and one-sixth of these cars were released before the beginning of the free time. Similar good records were made in following months, and in April no less than 26 per cent of the cars were released before the beginning of the free time. For example, in the case of a car arriving on Monday at noon, and on which the demurrage record, including the free time, would not begin until 7 a. m. of Tuesday, the load was completely discharged on Monday afternoon.

This circular reports the average detention per car at the New Orleans plant of Penick & Ford as follows: January, one day; February, two-thirds of a day; March, one and one-fourth days; April, one-half day; May, one and one-fourth days. The circular says:

"This is not a boast, simply a statement of where we stand. We hope to improve the record. What is your record Messrs. Shipper and Railroad man?"

Commission and Court News

INTERSTATE COMMERCE COMMISSION

A hearing was held before the suspension board of the Interstate Commerce Commission at Washington on August 28, on protests of the livestock shippers and packers against the proposed advance of approximately 15 per cent in the rates on livestock and dressed meats east of the Mississippi river, which is the first to be considered of a considerable number of proposed advances in commodity rates filed by the roads just prior to August 15, under the blanket approval given by the commission for the filing of tariffs up to that date.

The commission has issued the tentative report of its examiner on the proposed tariff, reducing from five days to two the free time allowed for holding domestic freight at New York for unloading. This tentative report approves the reduction. The commission has not yet passed upon the report nor approved the findings. The proposal to increase storage charges on both export and domestic shipments not handled within the proposed two days free time limit also was tentatively approved in the report. The proposal to reduce the free time of 15 days allowed for handling export shipments at North Atlantic ports and the free time of 10 days allowed at Gulf ports to five days is not approved.

The commission is now making public, by placing copies on the press table in the secretary's office, notices giving approval for the filing of tariffs, as required by the amendment to section 15 of the act, which became effective on August 9. When a railroad or a tariff issuing agency now desires to file a tariff containing an increased rate, it is necessary to file with the commission an application giving an explanation of the proposed increase and the reasons for it. Of the first five applications filed the commission had approved two up to Tuesday of this week, the other three being still under consideration. The notices state that a petition for approval of the tariff having been filed, the tariff is approved for filing without formal hearing, which approval shall not affect any subsequent proceeding relative thereto.

COURT NEWS

Improper Use of Brake Beam by Switchman

The Texas Supreme Court holds that negligence cannot be predicated on a railroad's failure to make a brake beam safe for a switchman to step on as the car approaches him.—*Freeman v. Garretts* (Tex.), 196 S. W., 506. Decided June 30, 1917.

Passes to Employees

The Massachusetts Supreme Judicial Court has issued a decision on the rule that, where a pass is issued to an employee as one of the terms of his employment, the clause by which the recipient assumes the risk of accident is not binding. The rule is held to be not changed by the Massachusetts statute of 1913 as amended in 1914, prohibiting free transportation, but permitting free or reduced rate service to employees, etc.—*Palmer v. B. & M.* (Mass.), 116 N. E., 899. Decided June 28, 1917.

Setting Fires by Sparks—Evidence

In an action against a railroad for destruction of property by fire, the Alabama Supreme Court holds that the defendant's evidence showing that its engine was properly constructed and equipped, in good repair, and properly operated and managed, was a complete defense unless the showing was contradicted, as by evidence that the sparks emitted on the occasion were of unusual size or in unusual quantities, or were thrown to an unusual distance, in which case it would be for the jury to say whether the construction, equipment, repair and management were proper and sufficient. Where the engine was pulling a heavy load up grade, it was held that a witness' statement

that it emitted an unusual quantity of sparks, as compared with other engines, as observed by him, was not *prima facie* relevant, and should have been excluded.—*L. & N. v. Davis* (Ala.), 75 So., 977. Decided May 10, 1917.

Hiring at Will for Deed of Right of Way

The Arkansas Supreme Court holds that a railroad's contract, in consideration of a right of way deed, to give the grantor a position as brakeman at regular work and a named salary, being for an indefinite period, was terminable at the will of either party, and a hiring for any substantial length of time and refusal to give employment for a further time, did not constitute breach by the railroad.—*Ashley, Drew & Northern v. Cunningham* (Ark.), 196 S. W., 789. Decided June 11, 1917.

Rates for Disinfecting Stock Cars

In proceedings before the Illinois Public Utilities Commission to fix rates for cleaning live stock cars, it appeared that the disinfecting of cars as required by the state board of live stock commissioners necessitated a detention of the car for one day and a charge of 45 cents for one day's detention was reasonable and customary. The Illinois Supreme Court held that the commission should have included such charge in the rates fixed by it.—*Commission v. Atchison, T. & S. F.* (Ill.), 116 N. E., 696. Decided June 21, 1917.

Free Passes—Stipulation Against Liability for Accident

Following the decision in *Ft. Wayne & Wabash Valley Traction Co. v. Justus*, 115 N. E., 585, the Indiana Appellate Court holds that a pass issued by the defendant railroad to deceased, an officer of another railroad, in exchange for passes issued by his road to officers of the defendant, as authorized by the Indiana statute of 1914, is a free pass or gratuity, so that a provision therein that he should assume the risk of accident is binding, preventing recovery for his death while riding thereon, unless caused wilfully.—*Mitten v. Delano* (Ind.), 116 N. E., 744. Decided June 29, 1917.

Insufficient Evidence of Negligence

In an action for personal injuries it was alleged that while the plaintiff was walking on a well marked path alongside the track a train passed him at high speed, sucking him against or under the cars. The Georgia Court of Appeals held the railroad not liable. Either the happening was likely to occur, in which case a man of ordinary prudence would be bound to guard against it; or it was unusual and extraordinary, and the men in charge of the train could not be expected to anticipate it.—*Southern v. Young* (Ga.), 93 So., 51. Decided June 27, 1917.

Corporation Excise Tax—"Income"

The Circuit Court of Appeals, Sixth Circuit, holds that where a railroad company bought stock in another company prior to January 1, 1909, for investment, and not for sale, but sold such stock at a profit subsequent to January 1, 1909, such profit was not "income," within the Corporation Tax Law of 1909, except to the extent that the selling price exceeded the ascertained market value on January 1, 1909; but to that extent the selling price constituted income, it appearing that the stock had a well-understood stock market value. The word "income," in the Corporation Tax Law, imposing an excise tax measured by income, means the same as in prior laws imposing a tax on income.—*Cleveland C. C. & St. L.*, 242 Fed., 18. Decided May 8, 1917.

Liability of Railroad and Hospital Association for Refusal to Give Treatment

Suit was brought by a railroad employee against the railroad and a hospital association connected therewith for failure to furnish medical and surgical treatment for the plaintiff's thumb, injured in the railroad's machine shop. The railroad deducted from the plaintiff's wages a certain percentage as hospital fees, which it turned over to the hospital association, a separate and distinct corporation, from which the railroad received no profits. The deductions thus made entitled the employees to medical

treatment in the hospital. On the back of each check to the plaintiff for wages was an indorsement, below which he always signed, to the effect that deduction for hospital fees was made with the express understanding that the sole obligation of the railroad was to pay over the money to the association. The plaintiff applied to one of the surgeons for treatment, which was refused. The Texas Court of Civil Appeals held that the railroad was not liable for the damage resulting to the plaintiff.

The original contributors to the hospital fund agreed with each other that the fund should be used for the sole purpose of treating and caring for [contributors]; and the court held that the use of the funds to satisfy this claim would be in violation of the agreement.—*Davis v. G. C. & S. F. (Tex.)*, 196 S. W., 603. Decided May 12, 1917.

Crossing Accident—Contributory Negligence of Automobile Passenger

The Nebraska Supreme Court holds that one who by invitation rode in an automobile driven by another and remained in it, with knowledge that it was approaching a dangerous railroad crossing without requesting the driver to stop or to take other necessary precautions to avoid danger, though, if he had looked and listened, there was time to induce the driver to stop or to jump out of the car, was guilty of contributory negligence, and cannot recover for personal injuries sustained from colliding with a passing train, even though no signal by the locomotive bell or whistle was given.—*Morris v. C. B. & Q. (Neb.)*, 163 N. W., 799. Decided July 3, 1917.

Leaky Valve—Assumed Risk

The South Dakota Supreme Court holds that a plaintiff railroad employee's testimony that an engine valve was leaky and that he was scalded by hot water and steam suddenly escaping does not establish the defendant railroad's negligence, where the cause of the leak is unexplained. The plaintiff employee had the burden of showing the defendant employer's negligence proximately causing the injury. If injury from escaping steam could reasonably be anticipated from a leaky valve, the plaintiff employee assumed the risk incident to such defect when he used the engine knowing its condition and that it could not be remedied until the engine reached another point.—*Lee v. Great Northern (S. Dak.)*, 116 N. E., 560. Decided June 26, 1917.

FUEL CONSUMPTION OF CANADIAN RAILWAYS.—The consumption of fuel of all kinds by locomotives on Canadian railways increased from 5,608,954 tons in the year ended June 30, 1907, to 8,995,123 tons in the year ended June 30, 1916. The average cost per ton in the last statistical year was \$3.11, against \$3.02 for the immediate previous year.

GERMAN COAL YIELD CUT 1,000,000 TONS.—Strikes of miners in Silesia during the month of July reduced the German production of coal by more than 1,000,000 tons, according to statements made in the debate in the Reichstag Main Committee on the fuel problem. Vice-Chancellor Helfferich gave an urgent and earnest warning against further strikes.

BY WATER INSTEAD OF RAIL.—To further the government plan of conserving railroad rolling stock, the Keystone Steel & Wire Company, of Peoria, Ill., of which W. H. Sommer is president, has experimented with moving its product by water. It has transported 1,200 tons of pig iron over 681 miles from Sheffield, Ala., to Peoria, almost entirely by water. The officials believe that this is the longest inland movement of pig iron made by water by any single manufacturer. The government took a deep interest in the matter, loaning some necessary machinery for loading the iron. It has not been determined whether this is a cheaper way of transportation.

BRITISH RAILWAYMEN'S FIFTH BONUS.—It is announced that the railwaymen's war bonus of 15s. (\$3.60) per week for men and 7s. 6d. (\$1.80) for youths is in future to be reckoned as wages. This will be of benefit to the men in that payments for overtime and Sunday duty will be calculated at the higher rate that includes the bonus amount. It is expected that the same concession will be made to the shopmen. This is the fifth increase in pay made to the railway men since the war commenced, three years ago.—*The Engineer, London.*

Equipment and Supplies

LOCOMOTIVES

THE MINNEAPOLIS & ST. LOUIS is trying to secure space for 5 Pacific and 20 Mikado or Santa Fe locomotives.

THE NEW YORK, NEW HAVEN & HARTFORD has ordered five electric locomotives from the Westinghouse Electric & Manufacturing Company, and it is understood will soon buy 15 more.

THE AMERICAN RAILROAD OF PORTO RICO has ordered 3 compound Consolidation locomotives from the American Locomotive Company. These locomotives will have 14 and 20 by 20-in. cylinders, and a maximum tractive effort of 15,000 lb.

FREIGHT CARS

THE INLAND STEEL COMPANY has ordered 72 50-ton general service cars and 35 50-ton hopper cars from the Bettendorf Company, Bettendorf, Iowa.

SIGNALING

THE KANSAS CITY TERMINAL has given a contract to the Union Switch & Signal Company for a 15-lever frame electro-pneumatic interlocking machine at High Line Junction.

FOR THE PENNSYLVANIA LINES WEST the Union Switch & Signal Company will install a mechanical interlocking at Hawthorne, Ind.; 4 switch levers, 10 signal levers and 5 levers for facing point locks.

THE PHILADELPHIA, BALTIMORE & WASHINGTON has placed an order with the Union Switch & Signal Company for a 23-lever electro-mechanical interlocking machine at Harrington, on the Delaware division.

THE CENTRAL OF GEORGIA is to extend its automatic block signal territory in the vicinity of Macon, Ga. Seventeen 1-arm and one 2-arm Style "S," double case, low voltage, ground signals, and other necessary material have been ordered from the Union Switch & Signal Company.

THE NORFOLK & WESTERN has awarded a contract to the Union Switch & Signal Company for the extension of the signaling on the electrified division near Welch, Va. Thirteen 1-arm, 3-position, Style "S" bridge signals will be installed. Centrifugal relays of the 2-clement type will be furnished for the track circuits; and vane type line relays.

THE PENNSYLVANIA has ordered from the Union Switch & Signal Company two interlocking machines for the Philadelphia Terminal division; at Twenty-second street an 83-lever frame Model 14 electro-pneumatic, and at Delaware avenue and Vandalia street a 19-lever type "F" electric interlocking; also on the Pittsburgh division an electro-pneumatic machine at Bennington, Pa., with a 23-lever frame.

CHINESE RAILWAYS SEEK MOTOR CARS.—Consul N. T. Johnson, at Changsha, China, requests that catalogues describing and quoting prices on small motor-driven inspection cars, such as are used on railway lines by engineers for inspecting track or roadbed, be sent to the consulate. Information concerning small 1-passenger or 2-passenger cars is wanted. The cars should be driven by kerosene motors rather than gasoline, if possible.

AMALGAMATION OF SIAM'S STATE RAILWAYS.—The Siamese Northern and Southern Railways, which up to the present time have been under separate management, have now been placed under a commissioner general of State Railways, and at the same time Henry Gittins, controlling engineer of the Southern line, has been appointed adviser to the new office. The Prince of Kambeng Bcitra, who about two years ago made an extended visit to the United States, has been appointed commissioner general of the amalgamated railways.—*Commerce Report.*

Supply Trade News

The Railway Specialties Corporation has moved its office to larger quarters at 30 Church street, New York.

W. S. Spiehl has been appointed manager of the Davis wheel department of the American Steel Foundries, with office at Chicago, to succeed F. A. Lorenz, Jr., who has resigned to go into other business.

The Lipman Refrigerator-Car & Manufacturing Company, Beloit, Wis., has commenced the construction of a foundry, tank and welding shops and an office building in that city, and will soon commence work on car sheds and other buildings. The initial expenditure will be about \$50,000.

Edward C. Fisher, manager of the Cooke Works of the American Locomotive Company since September 26, 1916, has been transferred from Paterson, N. J., to become manager of the American Locomotive Company's plant at Pittsburgh, Pa. A sketch and photograph of Mr. Fisher appeared in the *Railway Age Gazette* of September 29, 1916, page 569.

The American Car & Foundry Company has leased for five years a half of the 17th floor of the Hudson Terminal building, 30 Church street, New York, and will consolidate its New York and St. Louis offices there. At present the company has New York offices at 165 Broadway, but could not obtain sufficient space in that building to provide for the departments that will be moved to New York from St. Louis.

The Walter A. Zelnicker Supply Company, St. Louis, Mo., has recently secured the service of J. C. Bryan, formerly with Manning, Maxwell & Moore, Inc., as that company's southwestern representative of the Ashcroft Manufacturing Company, the Consolidated Safety Valve Company, the Hayden & Derby Manufacturing Company, and the Hancock Inspirator Company. Mr. Bryan will be associated with the equipment department of the Zelnicker company.

American Locomotive Company

If there is one thing in the recently issued annual report of the American Locomotive Company that shows what has been going on in the equipment market in the last few months, it is the statement that the total unfilled orders on June 30, 1917, amounted to \$77,620,449, as compared with \$19,376,532 on June 30, 1916. The American Locomotive Company completed its munitions work, which was being done at its Richmond and Montreal plants, this month. The amount of munitions orders which were uncompleted on June 30, 1917, was only \$3,566,528.

The gross earnings of the company in the fiscal year ended June 30, 1917, were \$82,000,000, as against \$59,000,000 in 1916. The increased cost of operation, however, was such that the profits on the year's business were only \$7,000,000, as compared with nearly \$11,000,000 in 1916. Dividends were declared in 1917 amounting to \$3,350,000, including 7 per cent on the preferred stock, 5 per cent on the common stock, and the special Red Cross dividend of one per cent on the common stock. This left a surplus of \$4,000,000, as compared with \$9,000,000 in 1916. From this surplus there was deducted a reserve for additions and betterments amounting to \$2,000,000, whereby the net credit to profit and loss in the year's business was \$2,000,000, making the surplus at the close of the year \$16,000,000.

Chairman, Sylvanus L. Schoonmaker in his annual report to the stockholders of the company, says in part:

"During the year prices of materials of all kinds increased to an unprecedented degree; a great scarcity of both skilled and unskilled labor existed, notwithstanding that large increases in wages were made and the working time of the shops shortened. These abnormal operating conditions, which could not be fully anticipated, affected the profits on both locomotives and munitions.

"Both in Canada and the United States, the selling prices on munitions were reduced to lower levels than prevailed in the preceding year and the new contracts for shells admitted, even under normal conditions, of a much smaller margin of profit than previous contracts allowed. The new contracts were for larger shells than those previously made, and necessitated large

additions of equipment and extensive alterations to plants, for which the sum of \$3,760,561.49 has been included in the manufacturing cost and deducted from earnings.

"The munitions work at Richmond and Montreal will be completed in August, 1917. The work of restoring these plants to locomotive production uses has already been started, and when completed the entire capacity of all of the plants of the company will be devoted exclusively to the manufacture of locomotives, which are urgently needed abroad as a war necessity, and also by the railroads of this country.

"As a part of the plan of restoring the Richmond plant, and with the purpose of obtaining an immediate increase in the foundry capacity of that plant for locomotive work, the company purchased on June 25, 1917, the land and buildings of the Henrico Iron Works Corporation at Richmond, Va., suitable, with improvements which can be quickly installed, for making locomotive gray iron castings. As a part of the purchase price of the Henrico property, your company assumed an outstanding mortgage of \$25,000, represented by an issue of the Henrico Iron Works Corporation of first mortgage 6 per cent gold bonds maturing August 15, 1919, which cannot be retired prior to maturity.

"It is the purpose of the management to manufacture as much of the material entering in large quantities into the construction of locomotives, as can be produced by the company to economic advantage. In accordance with this policy, the company purchased on July 2, 1917, from the Penn Seaboard Steel Corporation, a modern steel casting plant at Chester, Pa., known as the Seaboard Works. As a part of the terms of purchase your company acquired the full working organization of the Seaboard plant, which has continued to operate without cessation, and its entire output is now being used for the company's locomotive work.

"The company subscribed for \$1,000,000 of the issue of United States Liberty Loan Bonds of 1917, of which \$500,000 was in anticipation of subscriptions to be made through the company by its employees. Because of the country-wide over-subscription of the loan, the company's final allotment was \$612,500. Out of this allotment 7,867 of the company's employees purchased \$535,850 of such bonds to be paid for in weekly and monthly installments over a period of 50 weeks. The remainder of the bonds, amounting to \$76,650, are carried by the company as an investment."

The general balance sheet follows:

ASSETS	
Cost of property (less depreciation reserves).....	\$47,138,127
Sundry securities owned.....	908,328
Current assets—	
Cash on hand and in banks.....	\$4,710,572
Accounts and bills receivable.....	12,025,332
Liberty Loan Bonds 1917—Subscribed by employees (less installment payments).....	497,387
Accrued interest.....	3,959
Materials and supplies.....	7,306,337
Contract work in course of construction.....	11,169,751
Locomotives and parts in stock.....	130,387
	35,833,725
Sundry deferred charges.....	226,243
	\$84,106,423
LIABILITIES	
Capital stock—	
Preferred.....	\$25,000,000
Common.....	25,000,000
	\$50,000,000
Bonded debt of constituent companies—	
Locomotive and Machine Company of Montreal, Limited.....	\$1,500,000
Richmond Locomotive & Machine Works.....	432,000
Henrico Iron Works Corporation.....	25,000
	1,957,000
Current liabilities—	
Accounts payable.....	\$4,424,079
Income tax withheld at source.....	2,137
Unclaimed interest and dividends.....	2,961
Gold coupon notes outstanding, due July 1, 1917.....	1,336,000
Loans payable.....	1,000,000
Subscriptions to Liberty Loan Bonds 1917.....	516,800
Sundry accrued expenses, including accruals for United States and Canadian income and war taxes.....	2,719,684
Dividend on preferred stock payable July 21, 1917.....	437,500
Dividend on common stock payable July 2, 1917.....	312,500
Red Cross dividend on common stock payable July 25, 1917.....	250,000
	11,001,661
Reserve for restoration of munitions plants and other contingencies.....	1,507,796
Reserve for additions and betterments.....	3,722,597
Balance June 30, 1916.....	\$13,965,689
Add—Surplus as shown in condensed income account.....	1,951,680
	15,917,369
	\$84,106,423

Railway Construction

CANADIAN PACIFIC.—This company is increasing the capacity of its West Toronto yards from 1,700 to 2,200 cars, and revising the layout so as to eliminate conflicting movements. The Runnymede Road subway through the center of the yard, which now has a six-track steel superstructure, is being extended for six additional tracks with a reinforced concrete superstructure. The subway was excavated, and the abutments and the retaining walls built for a total of 12 tracks when the subway was originally constructed. All grading and track work is being done by the company's forces, and the Runnymede Road subway superstructure is being built by Archibald & Holmes, Ltd., Toronto.

Work has also been started recently on double tracking the line between Leaside, on the North Toronto subdivision, and North Toronto, about two miles distant. The grading is comparatively light, and this, together with all track work, will be handled by the company's forces. In connection with this work the company is removing two single track steel viaducts, and replacing them with reinforced concrete construction. Each is about 400 ft. long, and has a maximum height of approximately 100 ft. from base of rail to ground line. The one at mileage 0.9 over the Belt Line Ravine will be replaced by a two-track, and that at mileage 1.8 over the reservoir Park Ravine by a three-track structure. It is hoped to have the work completed by the end of November in order that it may be ready to handle next winter's traffic. The contract for bridge 0.9 has been let to the Dominion Construction Company, Ltd., and for bridge 1.8 to Wells & Gray, Ltd., both of Toronto.

ILLINOIS CENTRAL.—This company has completed plans for the construction of a brick freight house at Grand Crossing (Chicago). The structure will be 30 ft. wide by 200 ft. long, with wood block floor and slate roof, and will cost approximately \$70,000.

Plans have also been completed for an addition to the passenger station at Paducah, Ky., which will be 56 ft. by 22 ft., of brick construction with a slate roof, and will contain a lunch room and kitchen. The plans also provide for the installation of toilets in the depot and the construction of a frame canopy, averaging about 30 ft. in width, around the building, which will be about 250 ft. long. The work will cost about \$10,000.

A contract has been awarded to George B. Swift & Co., Chicago, for the construction of a freight house at Kankakee, Ill., to cost about \$20,000. The building will be 37 ft. by 128 ft., 60 ft. of which will be two stories in height. The structure will have brick walls, a slate roof and wood block floors (July 6, page 43).

A contract has been awarded to T. S. Leake & Co., Chicago, for the enlargement of mechanical facilities at Clinton, Ill. (May 18, page 1076).

W. J. Zitterell, Webster City, Iowa, has been awarded the contract for the construction of a freight house at Ft. Dodge, Iowa, to cost about \$25,000 (June 15, page 1260).

A contract has been awarded to Kehn Bros., Chicago, for the installation of heating facilities at the Burnside (Chicago) shops, to cost about \$5,000.

MIDLAND & NORTHWESTERN.—This company is erecting a station at Midland, Tex., to cost about \$5,500, the work being done by C. K. Stark. The grading for the road, which will extend from Midland, Tex., to Seminole, 65 miles, has been completed, and 48 miles of track have been laid. It is the intention ultimately to extend the line from Seminole to Roswell, N. M., 130 miles further. T. J. O'Donnell, president, Midland, Tex. (February 23, page 337).

MISSOURI, KANSAS & TEXAS.—This company will construct a new main line approximately two miles in length around the east side of its present yard at Muskogee, Okla., and a 2,500-ft. second main line out of the station. It will also rearrange and extend yard tracks, with a total cost of all improvements of about \$80,000.

NEVADA-CALIFORNIA-OREGON.—This road is erecting an administration building, a roundhouse, a machine shop and other minor buildings at Alturas, Cal., the cost of which, including real estate and necessary trackage, will aggregate about \$75,000.

NEW MEXICO LINE.—New Mexican interests are contemplating the construction of a railroad from Holbrook, N. M., 70 miles south into a timber belt lying in the government forest preserve.

NEW YORK, NEW HAVEN & HARTFORD.—Company forces are now at work on a new 18-stall brick, concrete and hollow tile roundhouse at Cedar Hill yard just east of New Haven. The roundhouse will be about 98 ft. wide, 488 ft. long, and will cost about \$141,000.

PEARL RIVER VALLEY.—This company has been chartered to build a railroad from Picayune, Miss., to Columbia, approximately 55 miles, the entire distance being through virgin timber lands. J. E. Du Pont, Jr., traffic manager and superintendent, Picayune, Miss.

PENNSYLVANIA RAILROAD.—Work was recently started on a two-story brick and structural steel outboard freight house and bridges connecting with the present inbound house and the Louisiana street viaduct at Buffalo. The building will be 32 ft. wide and 420 ft. long, and will cost about \$150,000. The contract has been let to the Geo. H. Shickler & Sons Company, Erie, Pa.

TAMIAMI RAILWAY.—This company has in mind a project to construct and operate a railway between Homestead, Miami, Fort Myers and Chevalier Bay, Fla. The line will secure a business in timber, agricultural products, citrus fruit and stock. J. F. Jaudon is president, and F. K. Ashworth is engineer at Miami, Fla.

RAIL MOTORS IN WAR.—The war, which has led to the development of so many other peaceful appliances and inventions, has witnessed the utilization of the rail motor car on an extraordinarily large scale. We are not referring to the self-contained unit, usually steam propelled, which is so extensively used on branch lines in the United Kingdom, but to the small petrol-driven vehicle principally employed as an inspection car in normal times. Vehicles of this type have found a singularly wide scope of utility for military purposes, since their construction and operation render them as fitted for employment on narrow-gauge or temporary railways as on standard-gauge heavy lines. A French official publication has described a particularly neat type of rail motor used on light railways in the hilly Vosges country. This has a sprung framework of locomotive pattern, the conventional motor car "bonnet," cross seats like those of a tramcar, and a control handle, which also resembles tramway practice. Officers desirous of reaching their destination quickly find these cars very useful. This particular design is typical of many used on various fronts by Allies and enemies.—*Railway Gazette, London.*

SCRAP IRON AND STEEL OF WAR.—Considerable speculation has been going the rounds as to the amount of scrap iron and steel that is accumulating on the battlefields of Europe, and how it is to be disposed of. American companies which regularly deal in such old material have for some time been looking forward to the harvest to be reaped from these battlefields after the war. These hopes have been rather rudely shocked lately by observers recently returned from the front, who state that this matter is now being handled by the respective governments. According to the systems now established in modern warfare, it is stated that a salvage corps is daily going over all the ground near the battle front exposed to fire, and is gathering all the debris discarded by the contending armies. None of the scrap is neglected, with steel worth 2 to 3 cents per pound and copper and other metals in proportion. All the metals are taken to shops in the rear and there worked over to be cast into other various metal munitions that a modern army uses. All the lead that is fired is practically lost, as a bullet traveling at a velocity of 2,000 feet or more per second buries itself so deep into any object it hits as to be lost entirely. Other metals, however, such as tangled steel from wrecked motor cars, large pieces of shells, bits of copper, pieces of aluminum, etc., are carefully collected and later turned into usable conditions.—*Scientific American.*

Railway Financial News

CARTHAGE & COPENHAGEN.—See Deer River Railroad.

CHICAGO & EASTERN ILLINOIS.—The sale of this company, which had been set for September 4 at Danville, Ill., has been postponed indefinitely by Judge G. A. Carpenter, of the United States District Court at Chicago.

DEER RIVER RAILROAD.—A charter has been granted this company by Secretary of State Hugo to operate the 9-mile line formerly owned by the Carthage & Copenhagen Railroad Company, operating between Carthage, N. Y., and Copenhagen. The new company is capitalized at \$100,000 in shares of \$100 each. The directors are: James A. Outterson, W. B. Van Allen, David W. Balmat, Guy C. Jones, Arthur W. Mattison, of Carthage; Alfred C. Stewart, of Ogdensburg; William T. Twining, Robert A. Ross, Eugene B. Millard, William L. Sheldon and Harry L. Grant, of Copenhagen.

HOCKING VALLEY.—This company has authorized an issue of \$5,000,000 6 per cent notes, maturing November 1, 1918, to pay off \$4,000,000 note, maturing November 1, 1917, and for other capital required. The directors have issued the following statement: "Last week the Circuit Court of Appeals of Franklin County, Ohio, handed down a decision confirming the right of the Chesapeake & Ohio to own Hocking Valley stock, thereby concurring with a decree to similar effect rendered in 1914 by the United State Court of Cincinnati. Nearly all the other conditions of the decree of last week have been complied with before the decree was rendered, and the remainder are in process of being carried out."

PENNSYLVANIA RAILROAD.—Judge Dickinson in the United States District Court has handed down a decision under which bondholders of the Pennsylvania Canal Company, a subsidiary concern of the Pennsylvania Railroad, will share in a fund of \$1,379,941.28. After a long litigation the court held that the loss suffered by the bondholders when the canal company was unable to meet its bonds at maturity, was due to the failure of the railroad to maintain a sinking fund under the terms of a mortgage under which the bonds were issued in 1870. Since that time the railroad has used effort in an attempt to prevent the distribution of the entire fund. In the exceptions to the master's report it was contended by the railroad that it should share in the fund as the holder of detached interest coupons from the canal company's bonds to the amount of \$3,116,400, and also a claim for \$518,400, the face value of 17,280 interest coupons the railroad had purchased from canal bondholders, should be allowed. In deciding in favor of the bondholders and dismissing the railroad's claims, the court said in part: "Accepting as we do the ruling of the state court in the proceedings upon the mortgage, we are bound to conclude that under the terms of the mortgage the interest coupons have priority of payment in the distribution of the proceeds of the mortgaged premises sold as the property of the canal company, and as against the canal company. To hold, however, that the railroad company in an action against it arising under the collateral agreement is entitled as a purchaser of the coupons to a like priority of payment over the bondholders would be to deny the soundness of the reasoning upon which the ruling already made in the case proceeded. The master was, therefore, we think, entirely right in holding (whether the question was strictly *res adjudicata* or not) that the ruling already made, which resulted in the creation of this fund compels the ruling that the fund created for the payment of the bonds cannot be diverted to the payment of the coupons."

TROLLEY LINES TO REPLACE CHINESE WALLS.—Canton's noted walls, which have stood for centuries, are now being torn down in the interests of progress, and trolley lines are to be built that will completely encircle the city and give the visitor an inexpensive and pleasant means of "seeing Canton." A survey has already been completed and the contract signed. It is expected that work will be begun immediately.

Railway Officers

Executive, Financial, Legal and Accounting

Edson J. Chamberlin, president of the Grand Trunk Pacific and of the Grand Trunk, has resigned and has been succeeded in both positions by H. G. Kelley, formerly vice-president of the Grand Trunk.

Albert J. Gillingham, assistant to the comptroller of the Pennsylvania Railroad, reached 70 years of age on August 23, and will retire at the end of the month under the operation of the pension rules of the company. Mr. Gillingham has been with the Pennsylvania Railroad nearly 48 years. For more than 17 years he was auditor of passenger traffic, and was advanced to the position of assistant to the comptroller on January 1, 1917, in connection with the reorganization of the accounting department.

Operating

T. J. Clarken has been appointed manager of the lighterage department of the Lehigh Valley, with headquarters in New York.

P. L. McManus, general superintendent of the Chicago, Indianapolis & Louisville at Chicago, has resigned, effective August 29.

Hubbard W. Williams has been appointed trainmaster of the Cairo district of the Illinois Central, with headquarters at Fulton, Ky., succeeding H. B. Dexonia, assigned to other duties.

P. F. Gilhoulia has been appointed chief train dispatcher, fourth district, of the Saint Louis Southwestern of Texas and the Saint Louis Southwestern, with headquarters at Mt. Pleasant, Tex., vice W. A. Downs, resigned; effective August 21.

J. B. Silaz has been appointed acting trainmaster of the Arkansas division of the Chicago, Rock Island & Pacific, vice Kepler Johnson, temporarily assigned to other duties. Mr. Silaz has been succeeded as assigned chief dispatcher of the Arkansas division by T. R. Latham; effective August 16.

J. W. Smith, superintendent of car service of the Western Maryland, has been appointed superintendent transportation and has been detailed for special service with the Committee on National Defense at Washington, D. C. He has been succeeded by E. R. Rouzer, who will have headquarters at Baltimore, Md.; effective August 1.

John L. Beven, trainmaster of the Illinois Central at McComb, Miss., has been promoted to terminal superintendent at New Orleans, La., succeeding Frank T. Mooney, resigned. Thomas J. Quigley, roadmaster at McComb, has been promoted to trainmaster, succeeding Mr. Beven, with the same headquarters effective September 1.

A. A. Gist, trainmaster on the Atchison, Topeka & Santa Fe at Arkansas City, Kan., has been transferred to the Southern Kansas division, with headquarters at Chanute, succeeding T. Cunningham, deceased. Owing to the increase in traffic on this division A. S. Wilkins has also been appointed trainmaster of this district, taking over part of the territory formerly under the jurisdiction of Mr. Cunningham.

Elisha Barton John, whose appointment as superintendent of the Delaware division of the Pennsylvania Railroad was announced in last week's issue, was born at Mt. Carmel, Pa., October 1, 1873. He received his preliminary education at the Bloomsburg State Normal School and the Bethlehem Preparatory School. He was graduated as civil engineer from Lehigh University in 1895. Mr. John entered the Pennsylvania Railroad's service for the engineer corps at Philadelphia, June 24, 1895. He served in that capacity until January 1, 1900 on the Philadelphia, Tyne and Altoona divisions, when he was promoted to assistant supervisor, serving in that capacity on the Pittsburgh, Altoona and New York divisions, until April 24, 1902, when he was appointed supervisor, and held positions in that capacity on the Delaware, Central, Maryland and Middle

divisions. On December 1, 1908, he was appointed assistant engineer, Delaware division, Philadelphia, Baltimore & Washington Railroad. On March 24, 1909, he was advanced to principal assistant engineer on the Philadelphia, Baltimore & Washington Railroad, and on January 15, 1910, promoted to superintendent, Delaware division of the Philadelphia, Baltimore & Washington.

James A. Morrison, whose appointment as superintendent of the Kentucky division of the Louisville & Nashville, with headquarters at Paris, Ky., has already been announced in these columns, has been in the service of that road continuously since 1886. Mr. Morrison was born December 6, 1868, at Sonora, Ky., and received a common school education. He entered the railroad service in May, 1886. He served for a time as telegraph operator and entered the despatcher's office at Louisville in 1889. He was transferred to Birmingham, Ala., as despatcher in 1891, and subsequently served respectively as chief despatcher of the S. & N. A. division, until October, 1892; master of trains until 1902; assistant superintendent until August, 1907, becoming superintendent of the Kentucky division on August 1, 1917.

C. S. Christoffer, trainmaster of the Illinois and Racine-and-Southwestern divisions of the Chicago, Milwaukee & St. Paul, with headquarters at Savanna, Ill., has been promoted to assistant superintendent of the Milwaukee terminals, with headquarters at Milwaukee, Wis. D. E. Rossiter, trainmaster of the Milwaukee terminals, has been transferred to Savanna, succeeding Mr. Christoffer, and the office of trainmaster of Milwaukee terminals has been abolished. The territory of L. T. Johnston, trainmaster of the Iowa and Minnesota division and the River division, has been confined to the River division, with headquarters at Minneapolis, Minn., and O. N. Harstad has been appointed trainmaster of the Iowa & Minnesota division. W. M. Thurber has been appointed trainmaster of the Dubuque division, with headquarters at Dubuque, Iowa, effective September 1, a new position.

Traffic

Alfred R. Hall has been appointed general agent of the Union Pacific at Lincoln, Neb., effective September 1, succeeding E. B. Slosson, deceased.

F. F. Robins has been appointed commercial agent of the Georgia Southern & Florida at Miami, Fla., vice W. M. Brooks, resigned; effective September 1.

G. N. Snider has been appointed coal traffic manager of the New York Central, with headquarters at New York, effective September 1, vice F. E. Herriman, who is assuming duties on the president's staff.

F. E. Herriman, coal traffic manager of the New York Central, will after September 1 report to the president's office, and will assist in matters pertaining to the coal properties of the companies, and perform such other service as may be assigned.

J. C. O'Boyle, traveling freight agent of the Wabash at Cleveland, Ohio, has been promoted to commercial agent at that city, succeeding R. A. Brown, effective August 16. Mr. Brown resigned to accept an officer's commission in the National army.

Spencer Eakin has been appointed commercial agent of the Georgia Railroad at Nashville, Tenn., succeeding M. H. Lillard, resigned to engage in other business. T. H. Yeargin has been appointed commercial agent at Chattanooga, Tenn., succeeding Mr. Eakin, and B. H. Lumpkin succeeds Mr. Yeargin as commercial agent at Columbia, S. C.

F. L. Dalton, general agent in the freight department of the Chicago & Alton, with headquarters at Chicago, has resigned to become traffic manager of Montgomery, Ward & Co. The position of general agent in the freight department at Chicago has been abolished. J. F. Vosburgh, assistant general freight agent at Chicago, will have charge of solicitation in the Chicago territory. T. J. Shea, assistant general agent in the freight department at Chicago, has been appointed commercial agent, with the same headquarters.

Engineering and Rolling Stock

R. W. Burnett has been appointed master car builder of the Delaware & Hudson, with office at Albany, N. Y.; effective September 1.

J. R. Watt, roadmaster of the Louisville & Nashville at Nashville, Tenn., has been promoted to general roadmaster, with headquarters at Louisville, Ky., succeeding Thomas Maney, resigned.

H. B. Holmes, chief engineer of the Kansas City, Mexico & Orient, with headquarters at Kansas City, Mo., has resigned to become associated with Cloverdale & Colpitts, consulting engineers, with offices in New York.

I. M. Brown has been appointed acting engineer maintenance of way of the Indianapolis Terminal division of the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Indianapolis, Ind., succeeding C. F. Hinchman, granted leave of absence; effective August 27.

Louis C. Frohman, whose appointment as principal assistant engineer of the Florida East Coast, with headquarters at St. Augustine, Fla., was recently announced in these columns, has been with that company since September 1, 1916. Mr. Frohman was born in Cincinnati, July 18, 1888. He attended the Ohio Northern University, and first entered railway service on November 15, 1909, on the Baltimore & Ohio South Western. He was appointed assistant engineer in the office of the engineer maintenance of way of the Baltimore & Ohio South Western and the Cincinnati, Hamilton & Dayton at Cincinnati, Ohio, January 1, 1913, upon the consolidation of the offices of these roads. He subsequently became assistant engineer in the office of the district engineer of maintenance of way of the Cincinnati, Hamilton & Dayton at Cincinnati, Ohio, on July 1, 1913, and was promoted to assistant division engineer of the Cincinnati-Toledo division at Dayton, Ohio, on January 1, 1914. He resigned September 1, 1916, to enter the service of the Florida East Coast as assistant engineer maintenance of way at St. Augustine, and it is this position which he is leaving to take up his new duties.

Railway Officers in Military Service

R. A. Brown, commercial agent of the Wabash at Cleveland, Ohio, has resigned to accept an officer's commission in the National army, effective August 16.

T. M. Ward, engineer of bridges and buildings of the Seward division of the Alaskan Government Railways, who has been commissioned captain in the engineering corps of the army, has been assigned to active duty at American Lake, Wash.

OBITUARY

William H. Arnold, terminal engineer of the Lehigh Valley at New York, died August 13 at the age of 53 years. Mr. Arnold came to the Lehigh Valley in January, 1914, and was terminal engineer at New York in charge of the new ore dock at Constable Hook, N. J., and the piers, pier sheds and dredging in New York harbor and at Perth Amboy, N. J.

A COMPLIMENT FROM THE PRESS.—A railwayman has been made First Lord of the Admiralty. This is not surprising. The railway business everywhere is associated with brains and capacity.—*Toronto Globe*.

RAILWAY BUILDING RECORD IN FRANCE.—Following is an extract from a letter from one of the officers of No. 2 Battalion, Canadian Railway troops, which is commanded by Lieut.-Col. F. F. Clarke, formerly a Canadian Northern Railway engineer: "We hold the record for railway building in France. We had a very difficult piece to build, because it was in full view of the German lines in daylight for about 1½ miles across a valley. On Tuesday night at 6:30 it started to rain and got very foggy and we got to work, and by midnight on Wednesday we had built 12,069 ft. of line, and ran a train over it. When the air cleared on Thursday the Germans saw the railway track from their observation balloon and started to shell it, and after sending over about 200 shells they broke a rail, which was repaired in a few minutes. This line can only be used at night, without light or noise. We have built 22 miles of light railway and 15 miles of standard gage, with 4 railway yards of about 3 miles of track in each. This makes about 49 miles of railway built and completed in 75 days."—*Canadian Railway and Marine World*.

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GENERAL NEWS SECTION.....

In the State of Colorado, in an accident such as the injury of a tramp, struck by a train, or when a careless trackman gets in the way of a locomotive and has his arm broken, it is the duty of the conductor of the train to telegraph at once to the capitol, at Denver, giving the details of the accident and its cause. This is required by an order issued on August 18 by the Public Utilities Commission of the state. The order requires telegraphic reports of substantially all train accidents in which men are hurt, and all cases of injury of persons by moving trains, and may be considered the response of this commission to the recent request of the railways throughout the country that during the present stress they be relieved of the burden of making unnecessary reports. The makers of this order, however, have not only ignored this reasonable request of the railways; they have disregarded the lessons of experience. The office of the Interstate Commerce Commission could show a tremendous volume of unnecessary telegrams of this nature, and with a much more reasonable classification—that is, with a somewhat rational rule for the exclusion of the less important accidents. Not that any accident is not a proper subject of investigation; all useful investigation is to be encouraged; but to insist on such excessive promptness where 95 to 99 per cent of the telegrams will do no good, can only be classed as childish. But for the evidence of the formal order, with the names of three commissioners attached to it, one might suspect that the document had been prepared by the newest clerk, brother to that superintendent's clerk who ordered, in the name of his boss, that all cars on side tracks should be moved, occasionally, so as to prevent flat wheels.

Nearly every one will concede that the prices of all stocks on the New York Stock Exchange on July 30, 1914, the day before the Exchange was closed, reflected the desire or necessity of investors and speculators to convert securities into cash rather than any calm judgment of the intrinsic values which lay back of the securities. On the other hand, the present prices of railroad stocks reflect the judgment of the investing and speculating public as to the intrinsic values in the future. Industrial stocks may reflect fear of a tax on excess profits,

Railroad Stocks Now and in July, 1914

price-fixing, etc., but railroad stocks can reflect such fears only to a limited degree. The railways have already had their regulation. Notwithstanding this, notwithstanding the prosperity that was made so much of by the Interstate Commerce Commission when refusing to grant increases in rates, notwithstanding the present large earnings, Atchison, Topeka & Santa Fe common stock is selling at almost the same price today as on the panic day of July 30, 1914, when the Stock Exchange had to close. Notwithstanding the tremendous industrial activity of the country, Pennsylvania common stock is selling at about 104 per hundred dollars par value as compared with 105½, the price on July 30, 1914. Some of the presidents of the richer roads admitted on the witness stand that their roads were not themselves in need of higher rates although their neighbors were, apparently. The Stock Exchange disagrees with them. Chicago & North Western, one of the gilt-edged stocks, is selling at about 107 compared with 126 on July 30, 1914; Great Northern is selling at 104 as compared with 114 on July 30, 1914; Lehigh Valley is selling at the same price as on July 30, 1914; Louisville & Nashville is selling at 123 as compared with 127. There are, of course, railroad stocks that are selling much higher today than they were in July, 1914. Norfolk & Western is selling 20 points higher, and Union Pacific over 20 points higher, but the fact which deserves most serious consideration is that such stocks as Pennsylvania and Atchison are selling now at panic prices. The market may be wrong. The prices made on the Stock Exchange are the consensus of guesses as to future values, but in the long run they have proved accurate guesses and guesses that were founded on a more profound understanding of general conditions even than the Interstate Commerce Commission brought to bear on the rate case.

Before deciding to employ women more extensively in railway service great care should be taken to determine those classes of work on which they can be used to the best advantages. It may prove a serious mistake to rush in and hire them without thoroughly studying the situation in all its aspects. Railroads, as other industries, have not infrequently lowered their efficiency and lost money by adopting fads. This has been true not alone of small and comparatively unimportant details,

Go Slow in Hiring Women Workers

but of larger factors, such, for instance, as forms of organization, types of locomotives, inadequate car construction, station design, etc. There are many clerical positions on railroads now filled by boys or men that can, without question, be acceptably filled by girls or women, thus releasing the men for more active work for which they are better fitted. To secure real efficiency, however, the women must be carefully instructed and coached for the work; this in most cases will require a larger amount of supervision than is ordinarily provided, at least during the period that the change is being made. When it comes to the heavier and rougher work the roads should go slowly. Under no circumstances should women be employed for work in the shops, or where men only were previously employed, until special facilities have been provided for their comfort and convenience. As far as possible they should be segregated from the men, and arrangements should be made so that they will naturally find it convenient to lunch in a group by themselves. Capable women should be provided to maintain the rest rooms and look after the women. They should have their own first aid experts. If practicable, a forewoman should have charge of each group of women workers. Unless these things can be done and adequate facilities be provided to insure getting real efficiency from the women, it will be better to get along without them. "Fads and Their Cost" was the subject of a paper read before the New York Railroad Club many years ago. It is vitally important that both energy and money be conserved at this time, and that luxuries in the line of fads and fancies be rigidly guarded against.

"Sure, I'd buy a bond quick, but where will I keep the thing when I get it." That, they tell us, lost more subscrip-

Where to Keep the Bond

tions for Liberty Bonds than almost any other single argument; and those who had charge of recruiting subscribers have scratched their heads over the problem of how to answer it ever since. But, it will not come up when the next issue of the Liberty Loan is floated in one place, and that is on the Pennsylvania Railroad. That company has recently announced to its employees that it will make arrangements to take care of the bonds for its employees free of charge. The treasurer has been authorized by the board of directors to take over for safekeeping the bonds of any employees who may request it. The interest on the bonds will be collected as it falls due on June 15 and December 15 each year and will be added to the payrolls for the last half of the months of June and December respectively. This will solve a vexatious problem for those who will be called upon to sell Liberty Bonds in the future and also for employee subscribers. The Pennsylvania, presumably, is not the only road that has offered to hold the bonds for its employees in this wise. There is no doubt, however, that those railroads that have announced such plans are performing a national service quite in keeping with the many other things they are doing in the present crisis.

REGULATION IN AID OF THE ENEMY

THE transportation system was the first element in our national economy to recognize the heavy responsibilities which the war placed upon the country and to take prompt and united action to meet the emergency. In view of the energetic and patriotic manner in which the railroads have discharged their duty and the close relation between their efficiency and military effectiveness, it would not be unreasonable to expect that the hostile attitude of governmental agencies would cease in large measure until the conclusion of the war. Recent reports from Texas, however, indicate that public bodies are still pursuing the short-sighted and habitual policy of harassing common carriers.

At the instance of the Brotherhood of Railway Trainmen the city commission of Fort Worth, Tex., passed an ordi-

nance compelling the railroads to use a crew of four men on trains in switching service and to have the air hose coupled up on all switching trains of five or more cars which are moved over grade crossings. The provisions of the ordinance stipulate that the extra switchman must be stationed at the end of each switch train to warn persons who may be on or approaching a crossing and that the air hose must be coupled up so that a train may be brought to a stop more quickly. Apparently the measure is intended as a safety regulation, but its framers do not seem to comprehend the obvious unfairness of placing all responsibility for keeping crossings clear on the railroads and none on the public. The portion of the ordinance relating to the use of air brakes is especially vicious in that it would greatly impede switching in a city where 40,000 soldiers are now assembled in the face of the specific demands of the government that all military traffic be handled promptly and expeditiously in time of war. Any one with the slightest appreciation of transportation problems will appreciate that the addition of 40,000 men to the population of a city in itself would strain to the utmost the yard facilities serving that point. Under the guise of protecting citizens from injury, and incidentally of providing additional jobs for switchmen, the city commission would add to the difficulties of the carriers and make railroad efficiency in a time of need impossible.

Fortunately, a judiciary farther removed from political influence than the commission has granted the railroads a temporary injunction which prevents the enforcement of the ordinance pending the outcome of a suit for a permanent injunction set for trial in January. The action of the city commission of Ft. Worth and the wire-pulling of the B. of R. T. which prompted it are acts fully as reprehensible as those which have gained wide publicity as calculated to impede the prosecution of the war and thereby assist the enemies of the United States. It is to be hoped that the public will soon see these anti-American activities in their true light, and deal as they deserve with public officers who by placing politics above national welfare give aid and comfort to the national enemy.

A VICE-PRESIDENT IN CHARGE OF THE MECHANICAL DEPARTMENT

A PECULIAR significance attaches to the appointment of W. D. Robb as vice-president of the Grand Trunk in charge of motive power, car equipment and machinery. The trying times through which our railways are passing are demonstrating beyond question the importance of the equipment and maintenance problems. It is necessary on most roads that the head of the mechanical department be given greater authority and facilities in order properly to administer the work of that department. No one understands better than the mechanical superintendent the tremendous losses that the railroads of this country have suffered in past years by the policy of changing the mechanical department appropriations and forces with every fluctuation in earnings, and without regard to the condition of the equipment. This same policy has had much to do with the inadequate supervision in the mechanical department on many roads and the lack of preparedness on the part of that department in providing plans and specifications for new equipment. Indeed, instances are not unknown of managements ordering equipment without consulting the heads of the mechanical department. These things have discouraged not a few of the most promising mechanical department men in the past and they have been lost to the railways because of the wider opportunities and better conditions which they have found in the industrial field. The railways could ill afford to lose them and in many cases have indirectly continued to pay part, or all of their salaries in the buying of equipment. Surely the railroad companies could afford to pay competent mechanical department officers as well or better than manufacturing companies which make a business of supplying one, or at the best, a

few of the specialties required by the mechanical department.

In England the locomotive superintendents deal largely directly with the boards of directors and their authority is said to be beyond the reach of the stockholders when questions of safety and proper working condition of equipment are concerned. Chairman Smithers of the Grand Trunk is an Englishman; he has been spending several months in Canada studying railway conditions and quite possibly it may have been at his suggestion that the new vice-presidency was created. Mr. Robb's record as superintendent of motive power is such as to insure his success in handling the larger and broader responsibilities in the new position and the development will undoubtedly be followed with closest interest by American railroads generally. The tendency toward a larger recognition of the importance of the mechanical department is reflected to a certain extent in this country by the promotion last winter of D. F. Crawford to the general managership of the Pennsylvania Lines West and also by the promotion last week of George W. Wildin to the general managership of the New York, New Haven & Hartford.

SHALL THE GOVERNMENT MAKE A LOAN TO THE RAILWAYS?

NATHAN L. AMSTER, president of the Investors' Protective League of America, has issued a statement advocating a loan by the government to the railroads of \$300,000,000 or \$400,000,000 out of the receipts from the next issue of Liberty bonds to bear interest at 4 per cent. Mr. Amster says that the most critical and urgent problem facing the railroads is that of financing extensions and improvements and caring for maturing obligations during the war. They cannot, he declares, sell long term bonds in competition with the United States Government, which is issuing billions of dollars of tax-exempt bonds at high interest rates; yet they are called upon to render more and better service than ever. The making of such a loan, contends Mr. Amster, is "an essential war need. Furthermore, such action would tend toward emancipating the railroads from the unhealthy domination of certain Wall street powers."

There are many people, including some railway officers, who contend that as the government is fixing the maximum return which, on the average, railways are permitted to earn, it ought also to guarantee them a minimum return. Mr. Amster's proposition goes somewhat farther than this and contemplates not merely a guarantee to the railways, but a loan.

Government financial aid to the carriers when their financial situation is so largely attributable to regulation seems logical. If the government is going to persist in the policy of so restricting net returns as to render it impracticable for the companies to compete successfully for the capital which they require, doubtless the time will come when it will have to give many of them aid in the form of subsidies, guarantees or loans to prevent the arresting of their development from causing general industrial and commercial stagnation.

The *Railway Age Gazette* does not believe, however, that government aid at present is desirable. Mr. Amster refers not only to regulation as one of the causes of the present situation of the railways, but also to the "unhealthy domination of certain Wall street money powers" as another cause. If these are the causes why not attempt to remedy the situation by removing them? The adoption of the reforms in our system of regulation which the railways have been urging upon the Newlands committee would cause regulation to cease to be unduly restrictive and burdensome. The adoption of one of the proposed measures, that is, the giving to the Interstate Commerce Commission of reasonable authority to regulate the issuance of railway securities, would largely solve the problem of Wall street domination by rendering the abuse of the power of the banking interests difficult, if not impossible.

The money which does a man the most good is that which

he earns himself. In fact, it may perhaps be said with truth that in the cases of 99 men out of 100 the only money which ever did them any real good after they became men was that they earned themselves. The same general principle applies to railroads. In the long run we will not have efficiently and economically managed railways unless we give them an opportunity to earn reasonable profits and then let them go bankrupt, if they do not do it. The benefits that might be derived from direct government aid, whether in the form of guarantees, loans or subsidies, would be but temporary, while the injury done by them would be permanent. If a government loan were made to the railways to enable them to refund maturing obligations, the time would come when there would have to be another refunding of obligations. Would the railways be in any better position to refund them later on a satisfactory basis? Not unless they were regulated meantime in a less drastic manner than they are being now. But the very fact that the government had made them a loan would be used effectively as an argument for not regulating them any less drastically. Meantime, it is questionable if the railways, having already received advances from the government, and probably living in the expectation of having them renewed or of receiving others, would be operated as efficiently as they would be if their managers knew that they must operate them efficiently or take the consequences.

The railways of the world have had a large amount of experience with government guarantees and loans. With a few exceptions the governments have had to pay part or all of the interest which they have guaranteed or to forego part or all of the interest on the loans which they have made. The result usually, in cases where public aid has been given, has been that government concern about and interference with the management of the railways have grown until finally the railways have passed into the hands of the government as its property. This is what is occurring now under our eyes in the case of the Canadian Northern in Canada. The government guaranteed interest on the road's bonds; had to make advances in payment of part of the interest, and now a measure is being considered, and probably will be adopted by Parliament for government ownership and operation of the Canadian Northern. This is the way in which government ownership and operation of the Western Railway of France was brought about. It was an entangling alliance between the government and the railways which was different in form but similar in substance which caused the railways of Italy to be transferred to government ownership and management in 1905. Examples might be greatly multiplied.

Mr. Amster's is only one of many proposals which recently have been made to have the government of the United States intervene very directly in the financial affairs of our railways. One proposal which has been made is for the government to buy 100,000 freight cars and put them in service. Another has been for the government to acquire ownership of all the freight cars in service. The *Railway Age Gazette* opposes all plans of this kind because it believes that the adoption of any of them would create a situation which would lead inevitably to government ownership without the question of government ownership ever being considered squarely upon its merits.

There has not been a single case in history where government ownership of railways has been adopted because the public, after full consideration, has deliberately decided that it was desirable upon economic, political and social grounds. The people of the United States ought to refrain from creating conditions which would make it impossible to consider the question of government ownership upon its merits. If we are ever to have it let us adopt it, not because we shall have created conditions which make its avoidance impossible, but upon the ground that we believe it will contribute more to the welfare of the public than private ownership and government regulation.

Letters to the Editor

CARLOAD—MINIMUM WEIGHTS

JAMESTOWN, Cal.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

In your editorial on page 48 of your issue of July 13, you mention a very vital fact in regard to heavier loading of cars when you state that "the receiver of freight is even harder to reach than the shipper." This objection has been raised by shippers in asking for carload rates, and I believe this would be an opportune time to readjust that item in all tariffs.

All of the railroad commissions seem to be adverse to the raising of tariff rates, but I believe a concerted action to raise the minimum weight for carload rates would meet with only a moderate objection. If such an increase were made universally I believe the shippers would endorse rather than object to the change. There are very few commodities that cannot be loaded to exceed 30,000 lb. to the car and such items could remain as at present.

S. H. SMITH,

Traffic Manager, Sierra Railway of California.

PSYCHOLOGY AND EXPERIENCE

ALBANY, N. Y.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Your correspondent who writes from California (Allen H. Babcock, July 20, page 96), about psychology and other things, proposes to change the whistle signal for highway crossings, so as to have a long blast come last; this to accommodate the rule to the idiosyncrasies of careless engineers. Believing it to be out of the question to reform the men, he would reform the rule. Is this the best way out of the difficulty? Look for a moment at past experience.

For half a century, more or less, the crossing signal consisted of only one blast; and everybody was happy. Is there any need for having this signal different from the signal signifying the approach to a station? If the way to improve our whistling is to make it easier for the engineman to adjust his mind to what is demanded, a change from four blasts to one blast would be a very simple way to go about it. I am informed that one prominent eastern road has—at least on some divisions—discontinued the use of the station-approach whistle-signal. Discontinuing it everywhere might not be an unprofitable experiment. The argument for moderation and common sense in whistling has been before the railroad world for years and yet does not make much progress; perhaps the easiest way to make such arguing effective would be to change it into a proposal to modify the whistling in this way—urge its abolition! Where crossings have an attendant the use of the crossing whistle, in numerous instances, has been discontinued at such crossings with satisfactory results.

It must be remembered that however simple or natural may be the requirement of the rule, there will still be the necessity for strict discipline. The hardest characters to deal with are not the men who blow a long blast because they believe it to be more suitable than that prescribed, but, rather, those whose mental operations are so unsystematic that they take no thought at all, except just enough to keep clear of censure. On the Boston & Albany, where the single "long" blast was in use at crossings for many years—and long after it was abandoned on most roads—the superintendents had to call enginemen to account frequently for annoying the residents along the line. The best of the runners complied with their instructions by reducing the single blast habitually to about one second. The writer

has noticed recently the whistle of a factory, which had been complained of as an illegal nuisance, because of its excessive noisiness. The court handed out a few sentences of common sense and that whistle now sounds regularly in only one second—and it seems to be satisfactorily effective.

One of the most pervasive facts to be remembered by American railroad men is the persistent conservatism of the American Railway Association, the code of which prescribes the "two long, two short" signal. Assuming that the signal ought to be changed, the committee of that association would probably demand that the proposition be supported by a good body of experience in favor of changing. Another fact is that many men in that association, as well as many other railroad officers, all over the country, are Morse telegraphers; and every one familiar with the Morse alphabet will agree that the present crossing signal, which means "7," is preferable to the reverse arrangement of the sounds which, from long experience, they have come to consider an unpleasant sound. The psychic theorists will tell you that there is a pleasing rhythm in — — — — ("7"), that is lacking in the opposite arrangement — — — — ("ut"). On one Eastern road, formerly, the crossing signal was one short, one long (letter *a*) and every telegrapher who ever heard it will say that it was a disagreeable sound.

I am not saying that telegraphers ought to rule our whistling or even that it is necessary, absolutely, that whistle signals should be pleasing to anybody; but it is only fair to take into account, in trying to adjust the code to the idiosyncrasies of the enginemen, that the rest of us have ears which ought to be considered. Mr. Babcock calls for discipline "along common sense lines," fearing unfavorable results from "arbitrary" discipline; but one of the most refreshing manifestations of common sense in whistling is that which is exemplified by the runner who constantly strives to please the public—a thing which all railroad men are being urged to do at the present time. The engineman who is thus striving cannot do better than to cut short his whistling. In studying how to shorten he will not fail to see other avenues of improvement.

F. W. H.

THE POWER OF THE "LABOR VOTE"

CHICAGO.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

There has been a marked tendency in recent years to pass laws favorable to labor unions and it has been evident in many cases that the only excuse for their enactment has been to secure the favor of railroad organized labor because of its supposedly great voting strength. It is well to consider whether the facts justify this supposition.

An investigation will disclose that railroad brotherhoods vote but a small per cent of their total membership. The men are away from home so much of the time that many of them will be absent on the registration and election days unless they are willing to lose a trip or two and this is rarely the case because it would mean a loss of from \$10 to \$40. A certain proportion of the men are never interested in elections one way or the other and of the remainder many who were home on registration day are absent on election day or vice versa so that the number who are actually enabled to vote is very small. Of these a certain proportion vote against the wishes of the organization because of party affiliation.

Thus it is seen that the legislators have greatly overestimated the power of the railroad unions. But the fact remains that a great many laws have been passed which benefit a few labor leaders, while working an injury to the railroads, the shippers—in fact, all the rest of the community. For instance, the federal locomotive inspection law is costing the railroads millions of dollars without working

in any way to their advantage. It is also costing the government about \$3,000,000 a year without any corresponding benefit. The full crew laws passed in various states represent another instance of misguided legislation for which there is not the slightest gain to any one except the brotherhoods.

It is high time for the general public to open its eyes to the wasteful expenditure of public money and for it to realize that all money used in operating the railroads comes from the public's pocket and that the cheaper a railroad can be operated the less it will cost to transport freight and passengers from one place to another.

R. S. BARKER,

Machinist Helper, Chicago & North Western.

THE OSTRICH IN THE SUPERINTENDENT'S OFFICE

REDSTOCK, Ark.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

William Shakespeare, Mark Hanna, or some other eminent gentleman once asserted that truth is stranger than fiction. This party evidently had never perused any of the morning operation reports of a modern railroad. It is safe to say that the vivid imaginary powers displayed in compiling some of them would, if given proper publicity, make any strictly truthful contributor to modern literature sob in earnest with envy. Of course, there are exceptions and in some instances truth crushed to the right-of-way will rise again; but in the majority of cases a comparison of the reports of movements of trains and tonnage to the actual performance will reveal discrepancies that cannot by any stretch of politeness be called slight.

I once honored with my services a road upon which there was a particular abhorrence toward reporting any delays due to failure of engines to make steam on account of poor coal. Nearly every train that crossed the division had trouble of that nature but it was particularly impressed upon all concerned that it should never be reported. Whether or not this was due to a more than friendly interest in the welfare of the coal company on the part of some one connected with the railroad, I do not know; but the orders came from headquarters and they were obeyed. The methods used in covering up of the delays properly chargeable to poor coal, were left entirely to the discretion of the individual who compiled the reports, who in this case happened to be me. I was once confronted with a deficit of forty minutes in the movement of the pride and joy of the line, the limited, generally known as the "Spanker"; and there was absolutely nothing to fasten the delay onto. It was reported by the engineer as due to poor coal, and a personal inspection of the coal in the tender showed it to be a dirty mess, about as inflammable probably as wet asbestos. Orders are orders, however, and after much deliberation I resorted to the expedient of reporting forty minutes delay at Zanzibar, "account tree fallen across track and calling section men to remove same." No one was ever unkind enough to call my attention to the fact that there wasn't a tree growing within a hundred miles of Zanzibar.

In another case the superintendent of a division which included a considerable stretch of joint track, on which there was supposed to be no discrimination between the trains of the owning and renting lines, was very sensitive about the condition of his roadbed—I will admit that he had just cause for his tender feelings—and gave strict orders that no delays were to be reported as due to slow track. The delays had to be charged to something and a budding genius among the dispatchers devised the method of showing all delays to the trains of one road as being due to meeting trains of the same or superior class of the other road. This in spite of the fact that frequently the trains enumerated as causing the delays were not within the boundaries of our division

at the time mentioned. But the reports for each road went to different sets of officers and they seemed to be satisfactory.

What is the purpose of these reports anyway? If it is to portray the situation on a division or a grand division in as pleasing a manner as possible, so as to furnish some one with light fiction for the diversion of their minds, they succeed admirably. If it is to show what has actually happened during the preceding 12 or 24 hours and expose operating deficiencies, they are a dismal failure. Frequently a department or division head, who would not for a moment tolerate dishonesty on the part of a subordinate in dealing with himself, will not only encourage, but sometimes practically demand, dishonesty on the part of that same subordinate in dealings with the general offices.

Nor is this paradox confined to division offices. A suggestion of the same tactics may be frequently found higher up.

It is a poor policy at the best, and frequently the failure to report adverse conditions in their true light acts as a boomerang when an attempt is made to secure funds or permission to correct those conditions. Furthermore the desire to cover up some particular kind of detention results sooner or later in the juggling of reports between connecting divisions, and this sometimes results in a more serious reflection than to face the facts squarely.

One factor which has aided largely in bringing about this condition is, I believe, the practice in some general offices of delegating the first reading of these reports to some clerk who, by virtue of three months' experience as office boy and two months' opening envelopes, is classed as qualified to analyze difficult operating problems; and giving him carte blanche instructions to "follow up" all remediable delays. The results sometimes are ridiculous. I recall receiving once one of these general office "bullets" peremptorily demanding why No. 1 was delayed seven minutes at Bearskin, meeting No. 2. The logical answer was that eleven miles intervened between Bearskin and Wolfhide—the next siding—and that double track between the two points was painfully noticeable by its absence. But it was necessary to be more diplomatic and skillfully hint that No. 2 was seven minutes later at Bearskin than was anticipated. Such things burden division offices with unnecessary correspondence and cause a great deal of irritation among the men who are doing their level best to keep the railroad running smoothly. The doctoring of reports is a logical result. The way the general offices go off half-cocked about such things would indicate that a division officer isn't competent to solve his minor problems himself at all. I believe that if some persons at headquarters were not so conscientious about sending a couple of dozen biting telegrams every time they read one of these reports, and if they would manifest more confidence in the division officers, they would find that the railroad was being just as well taken care of and that for some reason, the reports told more about what was actually going on than they ever did before.

Another factor, and the main one, is the fact that sometimes there are events daily taking place on a railroad of which everybody is aware, but which no one wants to see detailed on paper. To nominally conceal these things seems to satisfy some people. An ostrich is satisfied to hide its head in the sand.

Nor is the practice confined to any one set of reports. Tonnage sheets, car reports, and a great many others, come in for their share of garbling. I have known of more than one railroad man who rose mainly through his skill with a rubber eraser.

Honesty should be the best policy in railroading the same as in any other business—but it is plain that in some features of the business it is not so considered.

HOMER PIGEON.

NEGLECTING THE DESPATCHER

LITTLE ROCK, Ark.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Inspection trips made by officers constitute one of the worries of every despatcher. He knows he will receive little, if any, advance information as to their movements and he must handle the situation on a prophetic basis, trusting to luck. From a purely selfish standpoint an officer should make it a point to keep the despatcher posted on all anticipated movements, in order to give him an opportunity to figure with other trains. The writer has had some very trying experiences with official parties. One case in particular is recalled, where the superintendent was in charge, with a motor car, running under orders. The conductor reported for orders at 8:45 a. m., to leave at 9:30 a. m. He finally left at 1 p. m. and all the information I could get in the meantime was that they expected to move most any time. All this time I was fighting a road full of trains. Some trains were delayed by having to be stopped for orders at places where delays could not be avoided.

We are everlastingly after our conductors to keep us posted on their movements and our officers say they must keep us advised of when they will be ready at stations, etc.; why not the same rule for *all*? A despatcher does not feel like asking the superintendent every time he stops, what he is going to do; it becomes embarrassing. The conductors in charge could be of great assistance to the despatcher, but many of them think because they are with an official party all requirements are suspended, and they do not exert themselves in the least.

C.

"SWAT THE LETTER" CAMPAIGN

SAN BERNARDINO, Cal.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Did it ever occur to you that we have rules and instructions concerning the duties of all our employees from the sectionman to the chief despatcher and that each is required to be sufficiently familiar with them to render a fair equivalent for value received? Contrast this condition with that of the newly appointed member of the official family. He finds no definite outline of duty laid down, with a possible exception of the number and kind of efficiency tests to be made, the number of days he is required to spend on the road and how to make out his expense account. He spends a few days looking over the new territory and learning to match up new names and faces. Those days will always be treasured up in his memory, standing out in bold relief against the background of future experience in official life, because they were days of freedom from investigations, freedom from the burden of unanswered correspondence and the delving into circumstances surrounding some event of more or less importance so long past that it has passed from the memory of the employees involved.

This new member of the official family gets back to his office and unless he is a rare specimen commences where his predecessor left off—writing or rather dictating letters. Unquestionably events detrimental to the service should be looked into with a view of preventing a repetition. If of sufficient importance an outline should be given to the next in command and with it the action taken for correction, or recommendations as to the remedy needful. But to what extent this thing has grown and what a handicap on efficient service it has become can only be determined by a careful examination of the evidence at hand.

Colonel Charles Hine introduced steps to reduce correspondence—a commendable project—but even his system did not eliminate the man who, with possibly good intention, will insist on returning you the file of correspondence for further investigation and additional statements concerning some trivial matter that perhaps should never have in-

curred the expense of one sheet of paper. Is there any one on your railroad writing letters to people in the same building as himself—possibly on the same floor, or in the same room? Who is it that requires all this information and what use is made of it? The investigation necessary to furnish an answer to this question must start from the top—obviously we on the borderland can do nothing. Personally, I doubt if many general officers are aware of how much correspondence, routine and otherwise, could be forever dispensed with and not only make a saving in paper and clerical force but not loosen the reins on discipline one iota.

Consider the case of a trainmaster on a district a hundred miles or so removed from the division headquarters, practically level and in the midst of double track work with eight or ten work trains working under the supervision of the engineering department, automatic block signals being interfered with by new work, sidings full of outfit cars to hamper the locals, both freight and passenger business abnormally heavy, getting a mixed assignment of power—really the leavings of the other divisions because this was a level district and it could make a better showing with weaker power—in fact, where the engines are sent them to finish out their mileage. Add to this an unusually cold winter with plenty of snow. This trainmaster put on storm clothes and went to the front. His chief clerk handled the bulk of his correspondence but sent the more important letters to him on the line all written up and ready for signature together with his copy of the morning report and a birdseye view of the railroad.

At one point trains were bunching on account of no water. He was there in the middle of the night and found the pumping was done by a gas engine looked after by a man who had two such plants to care for about 40 miles apart and he was at the other plant. He woke up the town marshal who knew how to operate the engine and paid him in advance for his services until the water service department could correct its mistake.

Here are the conditions he found at another point at the middle of the district: Cleaning the fire—crew gone to eat—headlight will not burn—engine leaking—fireman sick—grates down—16 hours got us, etc. Early in the evening this condition was made worse by the engineer of a westward freight moving ahead in the oiling process while the fireman was taking water, resulting in breaking off the penstock and filling the link belt chute cellar full of water which promptly froze and put the coal chute out of business. He arrived in time to find an engine still alive and a crew with a little time left under the federal law. Took this engine and crew 15 miles to a siding full of live outfits and brought the entire string back, in the meantime finding a foreman who could talk English. Then began coaling up from the cars.

Trains tied up under the federal law will also freeze up. He was along with the relief crew to break the train loose a few cars at a time. Leading, coaxing disheartened men to work against such odds, lending them money to eat with, he kept in touch with a loyal chief despatcher who moved things when there was a hole to move them through.

Look at the other side of the picture: Officer on the same staff at headquarters—bankers' hours—steam heat—comfortable chair—morning paper—also morning report—analyzes the morning report of the district above-mentioned with critical eye and detects a false note in it, an attempt to cover up some real bad condition. He turns to his trusty stenographer and dictates a scathing sarcastic letter to this trainmaster, and upon second thought sends a carbon to the superintendent. The first letter reaches the subordinate officer the morning after one of these strenuous nights, followed a day later by the other barrel from the superintendent's chief clerk.

Is there any question that supervision by retrospection is a deadener? A glance at present methods of handling OS&Ds and live stock claims demonstrates the fallacy of the methods, for when the file reaches the bottom of the ladder and starts back a rubber stamp could be made summing up the result in the following: "No rough handling while in my charge." Conductors and engine foremen have been known to reply to these claims without going to the trouble of looking at their record to see if the shipment was handled by them at all.

If a "swat the letter" campaign is to be started it should begin high enough in the official world so that all departments will be affected. This letter has been confined to the operating department, but there exists enough abuse in other departments to attract the attention of the rank outsider. An effort at reform started from the division office is useless. Why it is not started from the other end may in a measure be due to the higher officer becoming so interested in the duties of his new office that he forgets the wrong that needed righting in his former position. So it is to the man higher up this appeal must be made. We have specialists in everything nowadays. Why not choose a man of ability and experience and attach enough authority to him to take him through the files of all departments and add weight to his words of instruction and advice to departmental heads as well as their subordinate officers and clerks to the end that tons of valuable paper may be saved, type-writers stored away and clerical forces reduced, not to mention the precious liberty to the line officer of being able to do today's business while it is today, thus saving the dollar on this day's operation instead of spending this day explaining why the dollar was spent yesterday?

TRANSPORTATION.

STRONGER CONTAINERS—AN AID TO BETTER CARLOADING

NORFOLK DOWNS, MASS.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The article appearing in your issue of July 13 entitled, "The Barrel Carries Its Own Running Gear," might lead the unthinking reader to believe that barrels could be substituted for all rectangular containers.

I agree in the main with the writer of this article that the barrel is one of the most desirable containers. Its use economizes in labor and loss and damage claims. While more space is required than with the rectangular package, the carriers receive compensation for this through the saving in damage and economy in labor.

But how can the barrel be used in these times for ordinary package goods? In the days of our forefathers, nearly all commodities were shipped to the corner grocery in bulk. The barrel or bag was the logical container for products in that form. Newer methods of living have created a demand for smaller units of merchandise. By the use of machines, the manufacturer reduces this cost of sub-dividing and insures to the consumer an absolutely sanitary package.

In a comparatively few years this packaging of goods has grown to a point where the container cost alone amounts to over 120 millions annually. Gradually, even articles like flour, salt and sugar have been going from the larger barrel units into the smaller sacks and cartons. In Minneapolis last year 94½ per cent of all the flour shipped out (19,000,000 barrels) was shipped in sacks. The greater percentage of salt and sugar used in the household is being shipped in carton form.

I believe you will agree that the barrel would not be practical as a container for cartons of any kind, and while it may be most desirable as a container, its field is limited. Customs have settled it that merchandise is to be shipped in rectangular containers.

The shipper, to economize on these containers, is seeking lighter and more fragile cases, with the result that the railroads, while paying at least \$15,000,000 in loss and damage claims, are also deprived of a large percentage of car space, thus increasing their operating expenses many millions. Both items of expense might well be considerably reduced by the use of pilfer-proof cases, sufficiently strong to withstand all shocks of traffic. If, as has been shown, eggs can be shipped from Russia to Pittsburgh, 9,000 miles, without one broken egg, there is no reason why the carriers should pay thousands of dollars annually in New York City on eggs that have been shipped less than 100 miles.

The figures tell us that 45 per cent of car space, as a whole, is unused. According to a statement by Grover G. Huebner, Professor of Transportation and Commerce at the University of Pennsylvania, it is costing the railroads not less than 209 millions to operate the 45 per cent of waste space.

"Now anything that can prevent this loss to the railroads, and at the same time will help shippers put money in their pockets, ought to be worth while. This is especially true, now that the purchase of new equipment to relieve congestion is made difficult because of the great demands on the steel mills and foundries.

"Poor packing cases are of themselves one of the worst drawbacks to efficiency in freight transportation and handling on all railroads in this country and, indirectly, they bear upon most of the other causes of underloading freight cars and on congestion at terminals. With a steel case that could be locked securely, which could be plainly marked, so that the destination always could be seen by the handler, and which would stand piling one on the other to the top of the car, millions of dollars paid annually in claims for thefts and for lost and damaged articles, as well as a part of the losses resulting from waste space, would be eliminated."

While fragile containers may be sufficient for a full carload of cereals to take one example, is it not true that when these same fragile containers are put in L. C. L. freight their weakness prevents the loading of the car much more than one tier deep?

It is the writer's belief that much of the congestion in terminals (where three cars are required when one should do the work) could be overcome; a large percentage of the annual payments for loss and damage could be eliminated, and a substantial amount of operating expenses could be saved to the roads were all merchandise offered for shipment in indestructible containers, sufficiently strong to allow of their being stacked to any height without fear of damage, regardless of contents. It is easy to see that the amount saved through this practice would mean far more to the roads than was ever saved by the tank car, and if the same consideration were given the shipper on containers of this type, his economy would be in the use of a container so strong that its life would be continued indefinitely. With no additional freight to pay, a strong case making 100 trips would be much cheaper for him than 100 cases for the same work.

Anything that we may do to discontinue the extravagant practice of throwing \$120,000,000 a year into the kindling-wood pile will work to the benefit of all. Barrel stock will be cheapened. The railroads will find that ties will be cheaper. Paper, which has gone up over 300 per cent certainly will be benefited if this is thrown back into paper pulp, as it represents practically one-half of the pulp industry.

We are being shown daily the importance of conservation in all lines. I believe this to be one of the most important changes possible, looking toward elimination of waste. The shippers, however, without concession from the carriers, are absolutely powerless to carry it into effect.

As I have before stated, if the carriers will recognize the benefits accruing to them by granting similar concessions as

were granted to the tank car, they at once add millions to their profits, save millions to the shippers, and by reason of the added material thrown back into the paper industry, relieve the public of an excessive burden being carried at this point.

W. H. DOBLE.

MISSIONARIES ON PUBLIC RELATIONS

BOSTON

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Your editorial note of July 27 proposing to stimulate trainmen to be missionaries on public relations opens up a great field of possibilities. Any railroad employee who values his job and who aspires to be really efficient in the service of his employer ought to be glad to embrace the opportunity, as offered by the general manager of the Illinois Central and as described by you, to enlarge his usefulness and at the same time to make his place pleasanter. One cannot really enjoy his work—if it bear any relation whatever to the general public welfare—unless he has an outlook beyond his own narrow sphere.

But your scheme does not seem to contemplate much of any active propaganda, beyond a series of circulars; and circulars do not go far in settling such knotty problems as this one. The reader feels like Mr. Barnum, who was served (at regular rates) with a beefsteak which was so small that, classing it as a mere sample, he told the waiter to "bring on some." If conductors and enginemen—to say nothing of the other classes to which Mr. Foley appeals—are to do any missionary work worth counting they must be trained in polemics. The conductor who knows how to meet the critic who is saturated with anti-railroad notions such as are circulated in Congress and other legislative centers, and who, in addition has a brother-in-law who nurses an unsettled claim of \$100 against a railroad—that conductor is a rare bird. The average conductor not only is poorly equipped for sharp discussion—he has not even got up to the level of *desiring* to emulate that quick-witted Illinois Central man.

Some time ago, on the New Haven road, I noticed a passenger conductor who, in a brief conversation, knocked a lot of erroneous notions out of a passenger's head; and he did the job with a good deal of skill. But, it was evident that he needed a lot of information himself. Moreover, though he was a good advocate I am not sure that he was an AI conductor, for one of the brakemen was inefficient. To have a good conductor and a good speechifier in the same man, and be sure of it every time, systematic training will be necessary.

I would suggest that Prof. W. J. Cunningham, of Harvard University, be engaged to stir up interest in this subject. The art of argumentation is one requiring a good deal of study; and the "university extension" idea should be mobilized for the purpose of turning Mr. Foley's suggestion to really useful account. On his own road he may, perhaps, have all reasonable educational facilities provided; but if this propaganda of promotion is to be of any appreciable use it will have to be pushed simultaneously on a hundred other roads.

You say (1) that the more intelligent employees of the Illinois Central will accomplish something if they are sufficiently courteous; (2) that some of them are prejudiced against the road; (3) that neither of these two classes are trained debaters and (4) that the importance of fact should be impressed on all. Surely, there is a good deal of work to be done before the expected good results will appear above the surface. If Harvard or any other university undertakes to qualify these or any railroad men by "extension" the *measure* of the extension will resemble the trombone used in Billy Sunday's entertainment—that is to say, it will have to be extreme.

Professor Cunningham would probably begin with a debate. Why should not every railroad superintendent spend time and money liberally in training his conductors and enginemen to debate effectively? A debating society could be made to improve a conductor's ability, as a converter of farmers, by 100 per cent. Every ambitious man in the train service ought to welcome any means of education in this line—intimate knowledge of the relations of the railways to the public—if for no other reason than the improvement which it would work in his chances of promotion.

A debating society ought to be welcomed by railroad men everywhere. Even the higher officers often waste their energies, and make ineffective arguments in dealing with the public, because of incomplete acquaintance with the facts of their own case and insufficient appreciation of the position of the fellow on the other side; his feelings, his views, and his facts. An open debate is the only sure means of curing these weaknesses. To send a man to break down the prejudices of farmers and politicians against the railroads, without first giving him some actual practice in meeting such prejudices, is as shortsighted as to meet a damage suit in court without a lawyer; or to set a trolley-car motor-man to handle a 50-car freight train down a two per cent grade. Practice makes perfect; and in this matter there is no substitute for practice.

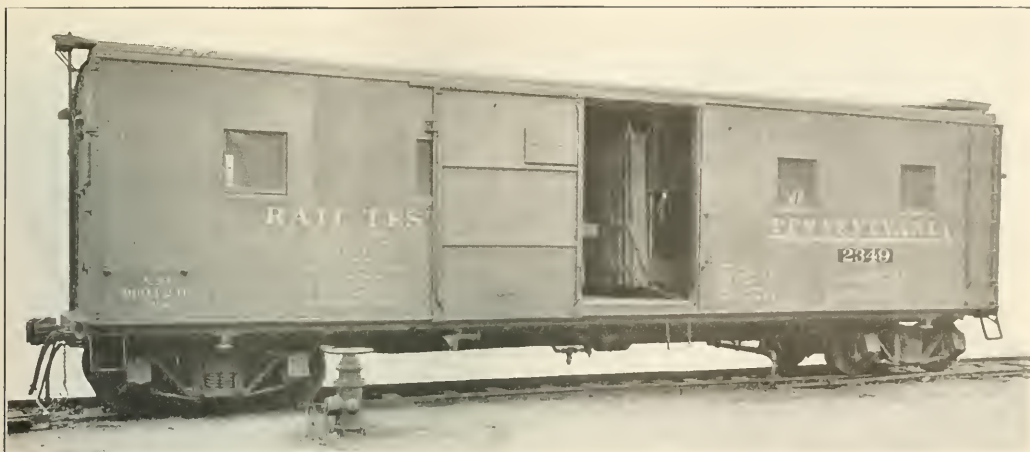
A debating society would be a valuable instrumentality, on most roads, to start some real, normal thinking in the minds of those conductors whose friendliness toward their employer is weak or qualified; conductors whom a brief letter from the superior would not touch. A railroad is such a large and complicated concern that feelings of unfriendliness, indifference, and even enmity, on the part of employees, are to be expected. Such feelings may be grounded in some detail or minor feature of the relations between employers and employees, and be a real drawback, while yet in the main the relation is actually friendly. Immense good would be done by clarifying the ideas of employees thus affected. Various schemes designed to overcome ill-feeling among employees have been tried; but we are still far from the ideal; why not try something different?

A debate develops little profit unless the sides are somewhere near evenly matched; and railroaders arguing for railroads ought to have as an opponent Clifford Thorne, or his equal, every time they intend to make and carry through any strong and important argument. The doughty Iowa advocate scarcely deserves this commendatory notice; but I refer to him simply to remind railroad men to beware of antagonists who are too reasonable! It is also important to find some one with staying power, dignity and serious purpose. Young men of this kind ought to be discoverable in every large city. It would pay well to compensate a few such men sufficiently to insure continued and persistent attention to the subject. Some reward ought to be offered for winners in debates; but not many railroad men have the technical ability as forensic specialists to argue effectively against their own side; hence this suggestion that the anti-railroad argument be always entrusted to persons who are not strongly pro-railroad.

Let us give "safety-first" and some of the other specialties a rest, for a time, and try something new! I heartily agree with Mr. Foley that trainmen ought to defend their employers; but, like the soldiers who are to defend us in France, they need a period of intensive training.

J. A. H.

RAPID GROWTH OF ELECTRICAL EXPORTS—American electrical apparatus is gaining rapidly in popularity the world over. A compilation by the National City Bank of New York shows that the value of electrical machinery, appliances and instruments exported from the United States in the fiscal year 1917 aggregated more than \$50,000,000 against \$30,000,000 in 1916 and \$6,000,000 in 1900.



The Exterior of the Test Car

Testing Rails by the Quick-Bend Method

A Description of the Apparatus Built Recently by the
Pennsylvania Railroad to Replace the Drop Test

THE Pennsylvania System first introduced the present drop test into its specifications for carbon steel rails in 1900, at which time the entire output of rail steel was produced by the Bessemer process, which, owing to the resulting high phosphorus content, imparted the predominant physical property of brittleness to the rails. Due to this fact some form of shock test was required to eliminate such rails as showed excessively brittle characteristics. The drop test proved the most adequate for this purpose. However, rails of open-hearth steel have come into general use since 1908, and at the present time practically all Pennsylvania orders for rails specify open-hearth steel, which, being low in phos-

phorus content, has the chief physical property of ductility and is much more tenacious for a corresponding hardness than Bessemer steel.

investigation should be conducted in order to determine the fitness of a transverse rapid bending test as an alternate or substitute for the present drop test of rails, with a view to obtaining more conclusive information relative to the physical properties, such as elasticity, ductility and hardness of the rail material. Accordingly, this investigation was made on the authority given for the test after a discussion of the subject at a meeting of the Pennsylvania System rail committee on April 9, 1915.

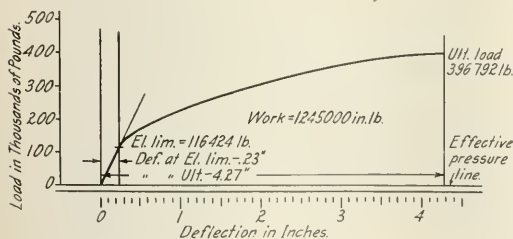
The sub-committee appointed to conduct this investigation submitted a report entitled "Rail Tests, Quick Bend Method," which was reviewed by the rail committee on November 10, 1916. Conformable to the recommendation of this committee an appropriation for the purchase of such a machine as proposed by the sub-committee and its installation on a suitable car for use in making parallel quick bend tests in conjunction with the standard drop test of rails rolled up on the 1917 schedule, was approved by the Pennsylvania Board of directors on November 22, 1916.

QUICK-BEND TEST MACHINE

The machine, which was built by the Southwark Foundry & Machine Company, Philadelphia, Pa., was delivered on April 16, 1917, and was placed in service immediately. Tests in accordance with a prescribed program have been conducted at several rail mills up to the present time.

The machine consists of a hydraulic press and intensifier, the design and operation of which were made to conform to specifications outlined under the supervision of J. T. Wallis, general superintendent motive power, Lines East of Pittsburgh.

The press is of the four-column inverted type, having a clear distance of 3 ft. 4 in. by 12 in. between columns. The main ram, 16 in. in diameter with a 12 in. stroke, is cast solid with the moving platen, which is guided on the four columns. The twin pull-back rams, 6 in. in diameter, are symmetrically located at the sides of the main ram, and are connected with the moving platen by 1 3/4 in. rods. The overall dimensions of the press are 5 ft. 6 in. by 3 ft. 1 in. at the



A Typical Diagram

base and 8 ft. 11½ in. in height. The maximum clearance between the moving platen and the base of the press is 2 ft. 2 in. The total weight complete with the loading head and two supports is approximately 22,000 lb.

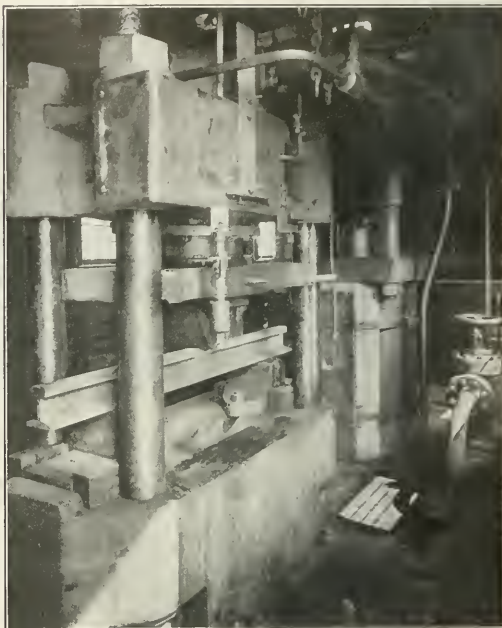
The overall dimensions of the intensifier are 2 ft. 11 in. by 2 ft. 11 in. at the base by 9 ft. 6½ in. high. It is of the single pressure type with a total weight of approximately 11,000 lb. The ram which extends from the high pressure cylinder to the base pressure cylinder is integral with the base pressure piston, and has a total stroke of 36 in. The diameters of the ram and the base pressure piston are respectively 9 in. and 26 in., which give a step-up ratio of about 8.35 to 1. The high pressure intensifier cylinder is directly connected with the press ram cylinder through a 2 in. extra heavy pipe provided with a 2 in. check and stop valve.

The operation of the machine is controlled by a bronze three-way valve having a balanced exhaust. By admitting 450 lb. per sq. in. line pressure to the base cylinder of the intensifier, the pressure in the high pressure cylinder thereof, and consequently in the ram cylinder of the press, is raised to approximately 3,760 lb. per sq. in., developing a total capacity in the press of about 756,000 lb. (378 tons). The 36 in. stroke of the intensifier ram actuates the entire 12 in. travel of the main ram by intensified pressure alone, thus assuring a smooth, continuous curve on the indicator card. The machine was accurately calibrated in order to ascertain its actual effective working pressure.

The machine is so designed that no more than 60 per cent of its total capacity is necessary for the maximum test requirements in order to prevent all undue strain and wear on the parts. Safety guards are arranged around the machine, to prevent the broken pieces from flying when the rail specimens rupture under test.

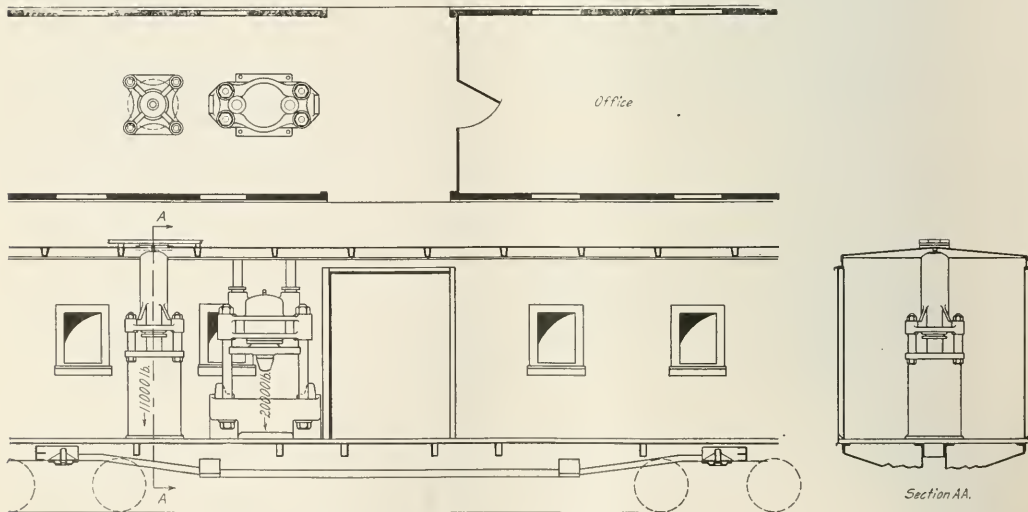
A hydraulic indicator is used to register the pressure required for a relative deflection of the specimen, the indicator being in direct communication with the main ram chamber through a ½-in. pipe, the movement of the indicator drum being actuated by the stroke of the main ram. A general

loading head on the ram at the center of the rail until rupture of the specimen occurs. During this action, which re-



General Arrangement of the Testing Machine

quires approximately seven seconds, an indicator card showing increments of deflection and corresponding pressure is



Plan and Sections of the Testing Equipment and Car

arrangement of the indicating apparatus is shown in one of the photographs.

The rail test specimen, properly marked, is placed on the supports of the press and pressure is applied through the

taken. An accurate reproduction of such a card is shown in a photograph. The abscissae of the curve indicate deflections, whereas the ordinates obtained in each case represent the load in thousands of pounds. The elements taken from

the card are the deflection and load at the elastic limit and the ultimate strength. The work required to fracture the specimen is also obtained from the card.

It is obvious that the complete ranges of elasticity and ductility of the specimen are represented graphically on the card thus produced, which provides a means of making a precise study of the physical properties of the material in the rail.

The machine is installed on a modified class X-25 car, the general arrangement being shown on the drawing. This car is equipped for passenger train service.

It has been demonstrated from comparative drop and quick-bend tests that rails which have met the drop test requirements showed undesirable physical properties when subjected to the quick-bend test. The narrow limitations of the drop test when compared with the advantages of the quick-bend test in the determination of the ranges of elasticity and ductility of the steel would seem to warrant the adoption of the quick-bend method of testing rails, and the data obtained from the program of tests being conducted on this year's rolling is to be analyzed thoroughly with a view to establishing a specification adaptable to the quick-bend test.

WASHINGTON CORRESPONDENCE

WASHINGTON, D. C., September 4, 1917.

TRANSPORTATION OF THE NATIONAL ARMY

Practically all arrangements have been made by the railroads for beginning on Wednesday of this week the transportation of the 687,000 men who will constitute the first unit of the new National Army from the 4,531 points designated as concentration points to the 16 cantonment training camps to which they have been assigned. With the approximately 300,000 members of the National Guard, who have also begun the movement to their training camps, many of them preparatory for early departure abroad, this will place upon the railroads the task of moving nearly 1,000,000 men within the next few weeks.

The National Guard is being moved in military units with its equipment and impedimenta from the various local camps and armories. The men drafted for the National Army are moving practically as civilians, to be retained and furnished with equipment after their arrival.

The American Railway Association was directed to prepare schedules for the movement and the work has been done by the passenger associations in conference with representatives of the operating departments. The original plan was to move 30 per cent from each local concentration point at the first entrainment, but under the revised plans of the war department only 5 per cent of the men, or about 35,000, will be transported in the 5-day period, September 5-9. As they will be moved at the rate of 1 per cent, or 7,000 men a day, it is not anticipated that this military traffic will cause any disarrangement of regular passenger and freight schedules.

In the five-day period beginning September 19, the railroads must transport 40 per cent of the new army, or 274,800 men, at the rate of 34,700 a day. Another 40 per cent of the army will be carried to the cantonments from October 3 to October 7. During these two periods the passenger facilities of the roads will be fully utilized. The remaining 15 per cent of the men will begin entraining October 17. The number of recruits to be transported from the states to the various cantonments in the next six weeks follows:

To American Lake, Wash.—From Alaska, 696 men; Washington, 7,296; Oregon, 717; California, 23,060; Idaho, 2,287; Nevada, 1,051; Montana, 7,872; Wyoming, 805; Utah, 2,359; total, 46,143 men.

To San Antonio, Tex.—From Texas, 30,545 men; Oklahoma, 15,667; total, 46,212 men.

To Fort Riley, Kans.—From Kansas, 6,514 men; Mis-

souri, 18,660; South Dakota, 2,717; Nebraska, 8,185; Colorado, 4,753; New Mexico, 2,292; Arizona, 3,472; total, 46,593.

To Annapolis Junction, Md.—From District of Columbia, 929 men; Pennsylvania, 32,859; Maryland, 7,096; total, 40,884 men.

To Yaphank, N. Y.—From New York, 43,000 men.

To Des Moines, Iowa.—From North Dakota, 5,606 men; Minnesota, 17,854; Iowa, 12,749; Illinois, 9,366; total, 45,575 men.

To Louisville, Ky.—From Kentucky, 14,236 men; Indiana, 17,510; Illinois, 10,573; total, 42,319 men.

To Rockford, Ill.—From Wisconsin, 7,181 men; Illinois, 31,714; total, 38,895 men.

To Battle Creek, Mich.—From Michigan, 30,291; Wisconsin, 5,695; total, 36,486 men.

To Chillicothe, Ohio.—From Ohio, 38,773 men; Pennsylvania, 4,000; total, 42,773 men.

To Wrightstown, N. J.—From New Jersey, 20,665 men; Delaware, 1,202; New York, 20,241; total, 42,108 men.

To Little Rock, Ark.—From Arkansas, 10,267 men; Louisiana, 13,582; Mississippi, 10,801; Alabama, 8,016; total, 42,666 men.

To Atlanta, Ga.—From Tennessee, 14,528 men; Georgia, 18,337; Alabama, 7,920; total, 40,785 men.

To Columbia, S. C.—From South Carolina, 10,081 men; North Carolina, 15,974; Porto Rico, 12,833; Florida, 6,325; total, 45,213 men.

To Petersburg, Va.—From Virginia, 13,895; Pennsylvania, 24,000; West Virginia, 9,101; total, 46,896 men.

To Ayer, Mass.—From Maine, 1,821 men; New Hampshire, 1,204; Vermont, 1,049; Massachusetts, 20,586; Connecticut, 10,977; Rhode Island, 1,801; New York, 6,000; total, 43,438 men.

PRIORITY OF SHIPMENTS

According to present plans the power conferred upon the President by the priority law to direct that certain traffic or certain shipments of commodities shall have preference or priority in transportation during the war is not to be exercised except when there is especial occasion for it. Robert S. Lovett, chairman of the Union Pacific and now a member of the War Industries Board of the Council of National Defense, who was designated by the President as his agent to issue such priority orders, has thus far issued only the one intended to promote the shipment of an adequate supply of coal across the lakes to the Northwest during the season of navigation, and at present it is understood that no occasion has yet arisen to require immediate consideration of further orders. Many requests for priority in transportation have been addressed to the priority director both by individual shippers and by various departments of the government, but such cases are usually handled individually by investigation of the requirements and a request to the railroad involved or to the Commission on Car Service to furnish cars or to secure expedition in forwarding the shipment.

Under the priority law a finding that a priority order is necessary for the national defense and security is made a requisite and under the interstate commerce law railroads are required to give preference to the movement of government freight so that most requests for priority do not require the issuance of an order but merely the direction of attention to the facts and circumstances, after which the railroad, or if more than one railroad is involved, the Commission on Car Service, may see that the special service is given.

The law provides for the issuance of priority orders to a committee representing the roads as their agent and promptly after its passage the Railroads' War Board sent out to the various roads a form to be filled out designating the War Board as their agent, empowered to receive on behalf of all

notice and service of priority orders. The Commission on Car Service also issued the necessary circular giving the roads instructions as to carrying out the order of August 20 to give preference in the distribution of cars to coal mines served by them for shipments of bituminous coal for transshipment by vessel to ports on Lake Superior and Lake Michigan. The purpose of this order was to secure the shipment of a little over 1,000,000 tons of coal a week to the Northwest before navigation closes and it has been carried out by so distributing the cars that transportation facilities would be available for shipments to that amount without so exceeding that amount as to create a discrimination against other districts.

Judge Lovett has many other duties in addition to those under the priority of shipments law. As a member of the War Industries Board he was in charge of matters pertaining to priority in manufacture of materials and supplies needed for war purposes. The board as a whole is charged with many functions relating to the contracts for supplies for the government and Judge Lovett is also a member of the central board in charge of purchases for the Allies. In his organization priority matters in general are handled by a priority committee which was formerly a sub-committee of the General Munitions Board, headed by General Ayleshire. This organization keeps itself in touch particularly with the requirements of the Army and Navy.

To handle transportation matters Judge Lovett has appointed as his assistant George W. Kirtley, recently assistant to the vice-president and formerly general superintendent of transportation of the Erie. After his appointment by the President, Judge Lovett immediately established relations with the Railroads' War Board and the Interstate Commerce Commission and Mr. Kirtley works closely with the War Board's Commission on Car Service and with the Division of Car Service of the Interstate Commerce Commission. The Commission on Car Service has the organization and machinery for arranging for expedited service or for securing a distribution of cars to points where they are most needed and it also has the necessary data and information furnished by its system of reports from individual roads and its sub-committees in various parts of the country. Ordinarily the Commission on Car Service is in a position to deal with requests of shippers or of the government without any occasion for a request on the priority organization. The Division on Car Service maintains no extensive organization of its own and works in co-operation with the railroad committee, often backing it up with its authority as a governmental body and also representing, in a way, the interests of the public and of the shippers. E. H. De Groot, A. G. Gutheim and H. C. Barlow, of the commission's division on Car Service, regularly attend the meetings of the Commission on Car Service.

WAR TAXES

Important changes in the proposed plans for war taxation of corporations have been made during the debate in the Senate on the war revenue bill designed to raise a revenue of between two and three billion dollars during the coming year. The Senate Finance Committee agreed upon a further amendment to the war profits section of the bill in the effort to meet the approval of those who have been insisting on higher tax levies of this character and the amendment was reported to the Senate on August 29. Under this amendment it was proposed to levy more than one-third of the total revenues to be derived under the measure, or about \$1,286,000,000, from the tax on war profits. As originally reported to the Senate, the war profits taxes aggregated \$562,000,000. Another committee amendment provided a change in the method of computing the so-called excess profits of corporations that had sub-normal profits during the pre-war years of 1911, 1912 and 1913, providing that

the amount of war profits shall be determined by deducting from the net income of the trade or business received during the taxable year, the average amount of the net income of the trade or business during the pre-war period, but that such deduction shall not be an amount less than 6 or more than 10 per cent of the actual invested capital as of January 1 of the taxable year. In other words, a corporation that earns more than 10 per cent during the pre-war period would be taxed on more than the difference between its income in that period and its income during the taxable year, while the corporation that earns less than 6 per cent during the pre-war period would be allowed to deduct at least 6 per cent for the purpose of determining the taxable proportion of its income during the taxable year. As originally reported to the Senate the bill fixed a graduated scale of rates ranging up to 50 per cent on war profits over 250 per cent. This was increased by the adoption of an amendment providing for a tax of 60 per cent on profits over 300 per cent. It was estimated that the bill would take in taxes about 31 per cent of the so-called war profits on corporations. Various amendments proposed by Senator Johnson and Senator La Follette seeking to take in taxes up to 80 per cent of the net income were voted down by a large majority. A final vote on the war profits section of the bill was to be taken on Wednesday, with a final vote on the bill by Monday, September 10.

NEW RAILROAD LAWS

The legislature of Illinois has amended the act of June 30, 1913, regulating highway crossings, and it is now unlawful to construct a highway across a railroad, or a railroad across a highway, at grade, without the consent of the Public Service Commission. The commission may order the reconstruction or relocation of a crossing, after giving a hearing, and may apportion the expense of such change. By the same law railways are required to remove trees, etc., which may obstruct the view at a crossing and, by December 1, 1918, to put up standard signs at crossings, as directed by the commission. At crossings designated by the commission as extra hazardous, stop signs must be put up.

This law became effective June 29 without the governor's approval. Another law which became effective in the same way, on the same day, deals with the same general subject. On certification by the Public Utilities Commission to the highway commissioners, the latter must abolish, alter or relocate railway crossings at highways. The highway commissioners must remove trees, etc., for 300 ft. on each side of grade crossings, outside of cities and villages; and at extra hazardous crossings are required to erect signs 300 ft. from the crossings, in accordance with orders of the Utilities Commission. Automobiles must approach crossings at not more than 10 miles an hour; and if there is a stop sign, must be brought to a full stop; penalty for disobedience, not over \$10.

Illinois has amended the act of 1905 so as to exempt narrow-gauge railways from certain provisions of the law requiring automatic couplers, air brakes, etc.

Pennsylvania has authorized corporations to continue the salaries of employees who enroll in the military or naval service of the United States or of any state. Another Pennsylvania law authorizes railways to construct such branches as their directors may deem necessary.

FURTHER RAILWAY RESTRICTIONS IN ENGLAND—The English traveling public is threatened with a further reduction of railway facilities next month, for the exigencies of the military situation have compelled the railway authorities to adopt restricted services. The revision of the services is being delayed until September in order to afford facilities to the public to take a reasonable summer holiday.

HOWARD G. KELLEY

Howard G. Kelley, vice-president in charge of operation, maintenance and construction of the Grand Trunk System, has been elected president of the Grand Trunk and Grand Trunk Pacific, succeeding E. J. Chamberlain, retired. Mr. Kelley has been vice-president since 1911, prior to which he was chief engineer. In the account of Mr. Chamberlain's work on the Grand Trunk, which appears elsewhere in this issue, mention is made of the very difficult situation which now faces the Grand Trunk and Grand Trunk Pacific. Mr. Kelley has the reputation of being an indefatigable worker, very strong physically as well as strong in his opinions and in his actions. He brings to the difficult task that faces the president of the Grand Trunk and Grand Trunk Pacific, energy, determination and driving power.

There are various possibilities which have to be faced. The Canadian government may take over both the Canadian Northern and the Grand Trunk Pacific. In that case the responsibility for protecting the security holders of the Grand Trunk, while in theory resting on the board of directors, will largely, in fact, rest on the president, since many of the directors are residents of England. If, as has been rumored, the Canadian government were to take over the Canadian Northern, but not the Grand Trunk Pacific, then there would be the extremely difficult problem of operating the Grand Trunk Pacific and the Grand Trunk, separated as they are by the distance between Winnipeg and Chicago, in such a way as to make a profitable system. Such a problem would tax the ability of the best railroad men that either Canada or the States have produced.

Howard G. Kelley was born January 12, 1858, at Philadelphia, Pa. He graduated from the Polytechnic College of Pennsylvania and began railroad work in 1881 as assistant engineer on location and construction on the Northern Pacific. In 1884 he left the Northern Pacific, engaging in mining, and three years later went to the St. Louis Southwestern as resident engineer and superintendent of bridges and buildings. His jurisdiction extended over the St. Louis Southwestern in Texas and the Tyler Southeastern. Two years later he was made chief engineer. On March 1, 1898, he became consulting engineer of the St. Louis Southwestern and also chief engineer of the Minneapolis & St. Louis. On July 4, 1907, Mr. Kelley was appointed chief engineer of the Grand Trunk System and on October 1, 1911, was appointed vice-president in charge of construction, operation and maintenance. Mr. Kelley was president of the American Railway Engineering and Maintenance of Way Association from March, 1905, to March, 1907.

BRITISH UNION'S RAILWAY STOCK.—The railway stock held by the National Union of Railwaymen is officially valued at £36,702 (\$178,375).

RED CROSS REFRESHMENTS FOR TROOPS ON WAY TO CAMP

Secretary of War Baker has requested Henry P. Davison, chairman of the Red Cross War Council, to arrange that Red Cross chapters throughout the United States co-operate with the War Department in providing for the comfort of the troops while en route from their homes to camps and cantonments. The Red Cross immediately wired directions to its division managers to instruct chapters to take immediate steps to supply the necessary food, drinkables, and other refreshments.

The Secretary of War has directed that accredited representatives of the Red Cross be informed of the movement of troop trains, in order that at points where trains stop chapters may be able to see to it that comfort of the men is cared for; and also that in the event of accident or delay at any unusual point measures may be taken to provide food and refreshments

for the men. The Red Cross had already issued to its chapters a model plan for the organization of refreshment units. Chapters are thus prepared immediately to undertake the provision of the proper equipment.

The equipment for a single refreshment unit provides enough coffee, for instance, for 1,200 men. Meals suggested consist of coffee, sandwiches, sausages, and cold beef, with buns or pies. In the case of hot weather, ice tea is expected to take the place of coffee. Special preparations will be made for sick and wounded. It is expected that at every important junction point or place where men are to be transferred or detain the Red Cross will provide stationary canteens.

TRADE BETWEEN GREAT BRITAIN AND BELGIUM.—The British government has appointed a committee to investigate the means of promotion and advancement of trade and commerce between

the British Empire and Belgium. One of the members of the committee is Mr. Frank Potter, general manager of the Great Western Railway, who represents the Railway Executive Committee.

AN INDIAN RAILWAY ACCIDENT.—An unusual accident occurred last month to a mixed train on the Kohat Tail Railway between Doaba, India, and Kahi. The train, which consisted of seven third-class cars, one composite, and two brake vans, on going round a bend was struck by a very violent storm which upset the whole of it, the engine alone remaining on the metals. As soon as it was possible, the engine was cut off and it ran into Kahi for assistance. Two third-class passengers were killed and five injured. No great damage was done to stock or permanent way. The storm was reported to be extremely violent. The engineman was trying his best to get into a cutting for protection, but the train was blown over before he could reach it.—*The Engineer, London.*



H. G. Kelley

FUEL ECONOMY FROM AN OPERATING VIEW-POINT

By Mark H. Reasoner

Heretofore much stress has been placed by mechanical men on fuel supervision and fuel supervisors and regularly organized fuel departments. This is only reasonable, but without support from operating officers and a definitely outlined program of duties for the latter much may be lost that might otherwise be gained by co-operation.

Naturally the organization of a fuel department presupposes that it will act as a buffer and an intermediary between the operating, purchasing and mechanical departments without undue absorption of the energies of any one department. The fuel department's representative should be of sufficient importance in the affairs of the road to merit the confidence of the operating officers and should have education, address, poise and the ability to convince the most skeptical superintendent or purchasing agent that his methods and data are sound. This is particularly true in the matter of bringing the results of tests to the attention of these officials. Test bureaus, though often doubted, secure correct results and the cost of their maintenance, while large, is many times repaid in indirect savings.

The operating department, since it is the one that consumes the coal, should confer with the fuel bureau, or the purchasing bureau, and co-operate in a friendly way in confirming the results of tests and in advising as to the best fuel to purchase. It should also endeavor to analyze the car supply and facilities for moving the fuel to conform to the best interests of the fuel bureau. The superintendent who checks overtime freight handling and yard efficiency and then falls down on his fuel checks is indeed lax. But in order to do this he must depend on the aides on his staff—the trainmasters, chief dispatchers, master mechanic and fuel accountant.

HOW THE TRAINMASTER CAN HELP

The trainmaster by his personal contact with enginemen, firemen, hostlers and coalers is especially in a position to correct any bad conditions as they occur and at least make a report of them to his superior officer.

In the movement of trains the trainmaster has an especially wide responsibility in his relation to coal consumption, in that he is in a position to start trains and keep them moving. If more trainmasters realized just what this means to the fuel performance sheet they would be as keenly interested in it as in the overtime statement. A careful check on this feature and a check of the train lists to ascertain if trains are properly made up in order to avoid an undue number of set outs and switching movements would reduce delays and effect a subsequent marked fuel saving. In this the train dispatcher is equally guilty of negligence.

THE DESPATCHER'S RESPONSIBILITY

The dispatcher should watch his trains and can save fuel in the judicious calling of crews; saving 10 and 15 minutes on the calls of crews to work in the course of a month leaves much coal on the pile unburned. He too often starts tonnage drags on the road which meet and are held up frequently by locals switching and doing way work at stations. At least two hundred pounds of coal is consumed for every stop or slow down of these big trains. A dozen such stops will waste at least a ton of coal, all of which could have been saved had the dispatcher been on the alert. The location of some water tanks and stopping for crossings all tend to waste the coal supply.

The dispatcher in his choice of meeting points can be a fuel economist of no mean order, or on the other hand can be a rank waster. Local and through passenger trains had better be "put in the hole" than to force a 4,000-ton drag

to slow down, stop, or saw-bye. It saves coal, drawbars, overtime and temper. The dispatcher can pick his order points with care and put his orders out at regular stops, making delivery of them while regular station work is being done; much fuel may be saved thereby.

The dispatcher in his watching of yardmasters and agents can inoculate them with the germ of fuel economy.

The yardmaster can regulate the switch movement, especially in classification yards, and in the matter of doubling over with long cuts of cars when making up trains.

In the northwest, days come when a 70-mile wind and a 45 deg. below zero temperature absolutely preclude the handling of tonnage in a satisfactory manner over some of the prairie divisions. If such trains are set back and ordered for a start just after sun set and a night run is made behind the plows they can generally be moved in good shape with marked economy of handling.

THE MASTER MECHANIC

The master mechanic, the third of the superintendent's aides, can materially help the operating department and especially the ordering of power. The two departments should have a friendly and perfect understanding as to when such power is to be used, because the mechanical department should have all the time necessary to complete repairs. Much fuel may be wasted by getting up steam earlier than necessary.

In these days when overtime forms such an important factor in wages, trains are often ordered out later than intended due to some unforeseen minor repairs not being made by the mechanical department; an outgoing train may thus be blocked in the yard because of being on an opposing passenger train's time. This makes terminal delay, fuel waste and often overtime.

FUEL ACCOUNTANT

The last aide to the superintendent in fuel economy is a man who on most roads is out of the superintendent's jurisdiction. The fuel accountant is often practically an unknown personage in the operating affairs of the road as compared to his brother, the timekeeper. The fuel accountant has been more or less suppressed, but he is called upon to distribute and account for one of the largest bills in the road's expense account. In the past he has not been encouraged to participate in the staff proceedings and has in many cases fallen into a rut, living from one monthly balance sheet to the next. If he is alert and bright and abreast of his position, he should be able from the figures passing under his eyes daily to notice the locomotives and engineers that consume coal in excessively large amounts. He can note how and where the engines coal, the kinds of coal they take and the use or misuse of equipment in hauling it from the mines. The fuel accountant should take a week's trip over the division at least three times a year and become personally acquainted with the men and facilities. Nothing will broaden the office man so much and increase his value in the organization more than the personal touch and a knowledge of actual working conditions.

Most of our railroads are operating today under the divisional system and the superintendent who appreciates the saving of fuel and what it means, its direct bearing on operating cost, and its many possibilities can and will get results and a large saving, though if he does not insist on his subordinates doing the same, the chances are that his efforts will be a failure. The question of fuel economy is not entirely one for chemists, inspectors, scale men or fuel supervisors; real fuel economy to be effective must start first with the purchase of the proper fuel and then should be carefully followed by the operating department, personified by the division superintendent.

EDSON J. CHAMBERLIN

E. J. Chamberlin has retired from the presidency of the Grand Trunk and has been succeeded by Howard G. Kelley, vice-president. Mr. Chamberlin went to the Grand Trunk Pacific as vice-president and general manager in 1909 and when Charles M. Hays, president of the Grand Trunk, lost his life in the Titanic disaster in 1912, Mr. Chamberlin was made president both of the Grand Trunk and the Grand Trunk Pacific. During the entire five years of Mr. Chamberlin's presidency the Grand Trunk and its subsidiary have had, for reasons beyond the control of the management, very hard sledding. At the time of Mr. Hays' death, the Grand Trunk through its controlled line in the United States, the Central of Vermont, was building a line from Palmer, Mass., to Providence, R. I. This involved bitter opposition on the part of the New York, New Haven & Hartford. The late Charles M. Hays was a strong man and a fighter. His confidence in himself was great and he carried within himself the plans for continuing the fight and getting the Grand Trunk out of the difficulties in which it had become involved. His sudden death, therefore, made the position of his successor extremely difficult.

E. J. Chamberlin was a very different type of man than his predecessor and his view of the New England situation has been apparently quite different than that of Mr. Hays. His general attitude of co-operation and conciliation has been apparent both in the abandonment of the line to Providence and in his treatment of the difficult questions connected with the relationship between the government and the Grand Trunk Pacific. He showed firm determination, however, in the stand that he took in regard to the National Transcontinental. The Grand Trunk had agreed to take over the National Transcontinental, which is the eastern extension of the Grand Trunk Pacific, and to pay a certain percentage of the cost of building the line. The Canadian government built the National Transcontinental through contractors, but when the time came for the Grand Trunk to take over this line, the costs were so high that the Grand Trunk refused to pay its percentage of them. It is understood that Mr. Chamberlin offered to pay a percentage of what would have been a fair cost to build the line. This the government refused to accept.

Mr. Chamberlin's estimate of the extravagant cost of the National Transcontinental was strongly borne out by the report of A. H. Smith, president of the New York Central, in connection with the investigation made by Sir Henry Drayton, W. M. Acworth and Mr. Smith for the Canadian Parliament. The refusal of the Grand Trunk to take over the National Transcontinental left a very difficult situation. The Grand Trunk Pacific, extending west from Winnipeg to the coast, is not earning its fixed charges. The Grand Trunk, extending northeast from Chicago, is not earning

sufficient to make up the deficit of the Grand Trunk Pacific, and, furthermore, we have the problem of operating a line which was intended to be a trans-continental, competing with the Canadian Northern, a transcontinental, on the north and the tremendously strong Canadian Pacific on the south, with the middle link of the system missing, or at least operated by someone else.

Mr. Chamberlin has carried the Grand Trunk through a very difficult period and retires now with the friendship of those with whom he has had to deal during this trying time.

Edson J. Chamberlin was born at Lancaster, N. H., and was educated in the Montpelier Methodist Seminary. He began railroad work in 1871 as timekeeper in the car shops of the Central of Vermont at St. Albans, Vt. He worked as clerk in the paymaster's office and clerk in the office of the superintendent of transportation and in 1877 became private secretary to the general manager of the Central Vermont. In April, 1884, he was appointed superintendent of the Ogdensburg & Lake Champlain and the Central of Vermont Line steamers running between Chicago and Ogdensburg. Two years later he was made general manager of the Canada Atlantic, now a part of the Grand Trunk. In 1905 he resigned to do contracting work in Canada and later in South America and Mexico. In 1909 he became vice-president and general manager of the Grand Trunk Pacific and as previously mentioned succeeded Charles M. Hays as president of the Grand Trunk and Grand Trunk Pacific in 1912.



E. J. Chamberlin

SIR ERIC GEDDES ON RAILWAYS AT THE FRONT.—Sir Eric Geddes, First Lord of the Admiralty, recently made his maiden public speech at Cambridge before an assembly of his constituents. He said, in part: "The railwaymen of England I hold in the highest regard, and that regard

has been intensified by what I have seen of their work in France. The railwaymen out there have given movement to the army. Railways are now ahead of the guns everywhere—(cheers)—and the work of the railwaymen has saved thousands and thousands of lives at the sacrifice of many of their own. I have been asked to tell you about myself. There is not much to tell. What little politics I had I have forgotten in the munition factories, in France, in the dockyards, and with the fleets. Before the war I had done soldiering in India. At the beginning of the war, at Lord Kitchener's request, I raised and commanded one of the finest pioneer battalions that ever went to France. I went to the War Office and had a hand at most things there, except shell production. Then I went to France. It was what I saw in France that gave me my determination that nothing mattered but to go on with the war to the end. To one who has witnessed the wreckage of the most malicious retreat in the history of the world, the sole thing that matters is to go on with the war to destroy the German military power.

SLIDING SCALE OF PAY FOR SALARIED EMPLOYEES

By S. B. Pugh

Railroads frequently have vacancies in the ranks of stationmen, warehousemen, baggage-men and clerks for which, in many instances, they are unable to secure candidates possessing previous railroad experience. This makes it necessary for them to employ an inexperienced person and require the agent, together with some of the other employees at the station, to break him in.

The salaries of all regular positions at a station, of course, are based on the minimum wage for which the services of a man experienced in that particular branch of the business can be secured. When the company is obliged to engage the services of a man without previous railroad experience—who usually resides in the community adjacent to the station where the vacancy exists, and is usually a young man living at home with his parents—his services are invariably obtainable, to start with, at a rate of compensation below the recognized salary of the position. In order to obtain this inexperienced young man, however, at the decreased rate, he ought to be made acquainted with the fact that, as his services become valuable to the company, his salary will be increased on a sliding scale until the maximum salary for the position is attained.

In the interest of economy and efficiency division officers should be given blanket authority to fill such vacancies—when necessary to employ those who do not possess previous railroad experience—at a rate deemed by the employing officer commensurate with the applicant's capabilities. This should be done, however, with the unfaltering understanding that they may increase the salary from time to time as considered consistent, the rate not to, of course, at any time exceed the regularly authorized rate of pay for any specific position. It will be necessary that the employing officer have authority to promise and substantiate these periodical increases without either the necessity of submitting or the necessity of securing the approval of any customary form covering changes in payrolls.

By the inauguration of this sliding-scale system, considerable money can be saved to the company, and the employee taken into the service will be better satisfied, due to the systematic remunerative recognition which he has been promised as his experience and efficiency increases. Furthermore, this system will make the experienced employees realize that their services are appreciated much more than were an inexperienced employee taken into the service and placed along side of them at the same rate usually paid for an experienced man. It is incumbent upon the other employees at the station to educate the beginner, and assist him until he becomes capable of handling the work. As soon as the inexperienced employee is taken into the service at a lower scale of wages than his fellow workers received at the same task, the men already in the service are immediately encouraged, as it is evident to them that the company places a premium upon their experience. This encouragement will be reflected by the increased interest they take in the performance of their duties.

For illustrative purposes, let us take a specific station where the rate of pay for warehousemen is \$75 a month. The railroad on which this station is located is, the greater portion of the time, able to secure the services of an experienced warehouseman at that fixed rate of pay, but occasionally it is unable to do so and, not desiring to increase the salary of the position, it is considered advisable to employ a young man inexperienced in railroad work. This young man is furnished transportation to division headquarters for the purpose of an interview with the division officer delegated to employ station forces. The young man

is told during such interview that the company is willing to start him in the railroad business, but naturally could not afford to pay him the same as it would a man of several years' experience. The company is willing to start him in the position at a salary of \$50 a month, and if he proves satisfactory, he will be increased at the rate of \$5 every four or six months, until the rate of pay reaches \$75 a month, the amount the company can consistently pay for the services of an A-1 experienced man in the position. In some instances it may be necessary to shorten the period of time between such increases, but in no case would the eventual rate exceed the present fixed rate for the position (except, of course, by formal approval of the customary form covering changes in payrolls).

It is necessary that the employing officer shall have blanket authority to promise and substantiate the periodical increases as the applicant's services warrant, which obligation it is necessary to assume at the time of employment as an incentive for the candidate to accept the position at the low rate of pay, which in many instances would be a lower wage than he could earn elsewhere in a line of employment in which he has had previous experience. If the employing officer does not possess this blanket authority to incur these obligations, and is obliged to prepare and submit for approval the regular form to cover changes in payrolls, regardless of the nature of his understanding with his principals, his formal request for increase in salary at times may either be delayed or declined temporarily, owing to some unforeseen condition which may arise at any time, thereby establishing a reputation of insincerity for the company and the division officers in the community served by the line, and retarding, if not making impossible, further promulgation of the sliding-scale system.

Incidentally the same system should be applied in division offices. When the chief clerk of a division office is obliged to employ an inexperienced clerk, he should be in a position to place him under this same sliding-scale plan.

This sliding-scale system means a considerable reduction in the overhead expenses of the railroad, but in addition to this saving in expenses, the most redeeming feature of the system must not be lost sight of; namely, the fact that it enables the railroad to secure that efficient and loyal service which is only obtainable—almost regardless of supervision and scrutinization—from the employee who is furnished an incentive for the creation of ambition, and who is acquainted with the fact that an exertion of his best efforts will receive monetary recognition. The necessity of some such attractive system for the encouragement of unorganized salaried employees is more in evidence since a state of war exists in this country which has resulted in much more alluring and entertaining wages being offered by manufacturers and others, and the marked reduction in the material available for railroad office positions.

This sliding-scale system is in effect in the general offices of one of the large trans-continental railroads at the present time, with the exception that the money saved by the filling of a vacancy (whether by experienced or inexperienced person) at a lesser salary than previously paid, is distributed among such employees in the office force as merit warrants; it has been productive of the formation of one of the most faithful and efficiently organized office forces in the country.

TUNNELS ON THE NEW AFRICAN LINE.—There will be four long tunnels on the new railway deviation in Natal between Maritzburg and Durban. The Delville tunnel will be 970 yards in length, the Barrier tunnel 962 yards, the Eldorado tunnel 374 yards and the Manzine tunnel 400 yards. The new line will be 300 yards longer than the existing route, but great benefit will accrue as the result of improved gradients and curves.

A Study of the Design of Docks and Wharves*

A Discussion of the Considerations Involved in the Location and Construction of These Special Facilities

By W. H. Hoyt

Assistant Chief Engineer, Duluth, Missabe & Northern, Duluth, Minn.

IN conceiving the general plan or scheme of a dock, wharf or waterfront improvement, the character of the service to be rendered or the mission of the completed property is of first importance. A dock and wharf is a means to an end. Except as the means determines the operating cost, the choice of the means is of less importance than the accomplishment of the ends. That plan which accomplishes the end with the lowest cost per year is the most economical. We must include in the cost per year charges which will secure all original invested capital. Each kind of business or service has its own peculiar requirements which call for appropriate qualities in the character of the dock and wharf.

GENERAL CONDITIONS GOVERNING LOCATION

If the dock is considered as being the water basin adjacent to the wharf and serving the purpose of giving approach to the wharf for appropriate vessels, it partakes of the qualities of any sea road, that is, sufficient room to maneuver the boats with ease and dispatch, including boats of the present and future increased size and sufficient frontage on the wharf to accommodate the required number of vessels with a depth to float loaded vessels of the present draft and future design. Consideration must be given to allowing space enough for maintenance and dredging operations if the conditions are liable to cause changes in the depth of water. The vessels inside the dock should not be exposed unnecessarily to rough water, and if possible the plan should be such as to secure favorable conditions at the entrance for boats during rough weather and various phases of the tide.

In some cases the dock may be constructed on the line of two adjacent properties of different ownership, the dock area chosen being sufficient to serve both properties. The total area thus devoted to water surface may be less than the area required if both parties were to build separate docks. Dock property, which includes the land under the water, available for construction of both the dock and wharf, has risen in value in recent years and economy in the plan which will minimize the area wasted in waterway is greatly to be desired. Community developments of dock property are very important. The United States Government has spent large sums of money in developing harbors and approaches thereto and will continue to do so. This cost is borne indirectly by all and economy in the use of the frontages on these harbors will lessen the total amount required to be spent on harbor development, besides producing the greatest returns to each individual property. Sometimes the dock work is reduced to a minimum because the necessary service is secured by a pier run out into deep water.

The general scheme of a wharf will often be started with limitations of property available either because of prohibitive cost or the finished development of adjoining property by other owners. The shape of parcels of water front property is more liable to be irregular than regular, sometimes approaching the square, at other times a long strip between other strips. Sometimes when the shape is suitable, the approach is unsatisfactory because of developments of industries and surrounding communities. The facility of approach with railroad tracks, complications of manufactur-

ing and improved properties, and the general natural layout of the ground over which the approaching railroads are to operate, may alter the general conception materially. These predetermined conditions may force unsatisfactory arrangements, but care must be given to eliminate constrictions at any point on the approach which will develop neck-of-the-bottle effects and limit the full use of the property.

Changes in value of real estate and dock property should be considered. Property may become too valuable for use as originally intended and require a change to justify the interest charge which is always to be governed by present values.

CONSIDERATION OF TRAFFIC TO BE HANDLED

If the plant is to accommodate passenger service, its arrangement as to safety and convenience should be given careful attention. Ease of transferring passengers from trains or from land approaches to floating equipment and ample room for allowing rapid and safe movements, are factors which will largely control the general conception, as will also the passenger service, whether ocean-going, long voyages or short-voyage ferry service. The character and number of passengers handled influence the weight to be given to convenience and comfort. As passenger service comes in contact with human and psychological factors it requires a higher state of perfection, dependability and safety, especially so if in competition.

If the service is that of handling freight there are even more factors arising which will influence the arrangement. To handle miscellaneous package freight, its adaptability to the use of loading and unloading machinery and to the movements of freight from floating to rolling equipment, or vice versa, must be considered. To handle bulk freight such as coal and iron ore either from boats to docks or from stock piles, docks or cars to floating equipment requires an entirely different class of structures from that designed to handle package freight exclusively. The former may be exposed to the weather while the latter may require protection of warehouses. The character and weight of freight affect the storage and working areas required.

The character of the boats, whether ocean, lake, canal or river-going, whether they are standardized and whether they are equipped with freight-handling machinery, has a very important bearing on the wharf requirements. Great Lake boats for ore, grain and coal carrying are fairly well standardized. Canal service tends to standardization. Ocean-going vessels are more varied in character. Labor conditions and whether men are transient or stable influence the amount of machinery required for handling freight.

OTHER CONSIDERATIONS

At present the tendency toward government ownership and control may influence the amount of the expenditure to be made. In case of a transfer of ownership a permanent structure would bring a larger proportion of returns than one of temporary character. On the other hand, other conditions of public sentiment may tend to heavy taxation of the corporation and its property and thus the advantages to be gained by expending money in permanent construction would be offset by the additional taxes on such property. The fire hazard and insurance rate on property of this kind

* Abstracted from Bulletin 197 of the American Railway Engineering Association.

is very important. If located in the immediate vicinity of structures whose materials increase the fire hazard, fire resistant construction would be advisable. Rates of insurance in different localities should be considered carefully.

The height of the structure is often determined by its location on a shore line subject to rise and fall of the water due to tides, wind action or flood conditions of a river. The action of salt water upon different structural materials, the climatic and atmospheric conditions, decay and deterioration due to marine growths, the violence of wave action, the general prevalence of storm conditions, and ice accumulation will all have their influence on the choice of materials. The life of wood commonly used in each locality is a factor in the choice of timber or some more permanent form of structure.

The foundation details are variously affected by the character of the soil upon which the structure is to rest. A soft alluvial deposit or sand will often require very long piles, while if rock bottom may be reached without great expense, cribs or piers may be constructed economically. River or stream flow may wash out foundations or fill up adjacent docks. The season of the year when a wharf may be started might determine the character of construction chosen.

In most of our harbors conditions imposed by the general layout of the government harbor lines affect the general shape of the work. Where the government harbor lines are laid out far from the natural shore line, construction will develop into long and slender wharves, while if the harbor lines are close in shore, structures will develop into broad and probably filled docks. If the adjacent channels have not been developed to their final form by government decision, it might be unwise to adopt permanent construction. Sometimes riparian rights have not been settled by court decisions and permanence of legal rights should precede permanence of construction.

Business and economic conditions have a most important part in the design of a wharf. For instance, a lumber wharf built in a country where the timber business will last only 10 or 15 years will suggest a cheap first cost, while a structure to handle package or bulk freight serving ocean liners would naturally suggest permanent design. The volume of business to be handled at the dock, its rush times at certain seasons of the year, its possibility of increased growth or change of character of shipments may also develop a special design. The principle of obsolescence places limits on the investment even if no other limit comes in.

Many times judgment on general layouts will be made on the visible and self-evident factors, but the indirect and intangible things may be of greater value, as, for instance, the principle that the breakdown or loss of service of a part of the whole train or sequence of operation may entail loss of many times the cost of permanent construction in the loss of time of the rest of the machine, which may mean delay of all correlated transportation.

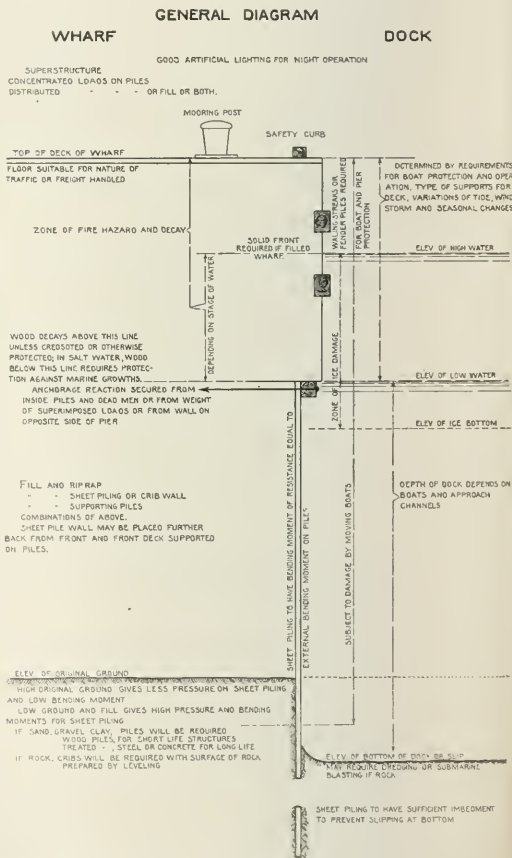
The item of maintenance cost is very important. Even at the present prices it may be the deciding factor, but with the upward tendency in the price of materials, repairs may run into larger sums than first contemplated and so balance the increased cost and interest on better structures. Maintenance costs vary through difference in the thoroughness of the system of maintenance, prompt repair oftentimes saving greater losses.

THE DESIGN OF THE SUBSTRUCTURE

Any substructure may be divided into elements as indicated by the diagram and notations thereon. The critical region where the greatest variation in design and construction occurs is that next to the dock basin or the part of the wharf which comes closest to the boats, for here we find a variety of forces and requirements. The vertical loads are carried by piling, sheet piling, crib walls and fills. The

horizontal pressures, where they exist, are carried by sheet piling or crib walls. Boat impact and mooring stresses are usually carried by the structure as a whole.

Of the faults in the foundation uneven settlement is worse than uniform settlement because it sets up destructive stresses in the superstructure. Therefore, if settlement seems unavoidable, attention should be given to keeping it as nearly uniform as possible. This can be attained by using a uniform system of support. One of the most common causes of failure, and perhaps the most common defect in dock foundation construction, is the improper spacing of the supporting piling. The tendency is to space piling more or less uniformly throughout the structure with utter disregard of the



Summary of General Considerations Which Govern Design of Docks and Wharves

unequal distribution of load. Often the parts of the dock carrying no load at all are supported by the same distribution of piling as the part of the structure carrying the maximum loads. Piles should be so placed as to receive uniform loading for each pile.

By far the greater number of all docks yet built or being built in this country are designed with wooden piling to carry their loads. In many cases they are being surmounted above water line by concrete piers either with or without timber grillage. It is becoming more and more the practice at the present time to use treated timber and treated

piling in all work subject to destruction by the teredo or other form of marine borers.

Where piling is driven in very deep water and future plans contemplate permanent filling of the dock, it is often good practice to fill in around the piling to a certain depth with rubble stone, thus stiffening the foundation and causing less damage to buildings and structures due to the shock of berthing boats. Some structures are surrounded by timber sheet piling well anchored back with steel rods and the wharf is then filled to the required height. A few have already used steel sheet piling for this purpose, thereby obtaining a very permanent foundation.

During the past a great many docks have been constructed of timber cribs sunk along the dock line without placing

The present depth of channel as well as the depth that may be required in the future should be given careful consideration. If the structure is one to be used a long time its future improvement by changing a timber foundation to one of more permanent design of concrete and steel must be considered.

Filling behind sheet piling or in cribs should be distributed uniformly and in horizontal layers. Sheet piling walls and cribs should be tight so as to retain all the fill permanently. Cribs should rest fairly on suitably prepared bottom. Ample allowance for strength in the foundation for all loads and forces which may come on the wharf and prevention of overloading later is the best way to minimize settlements.

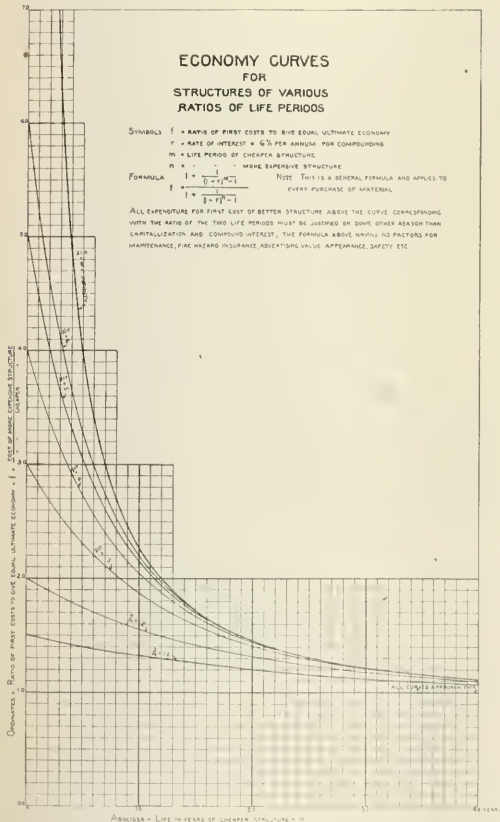
When a boat strikes a wharf or pier the damage done will depend on the size of the boat, its speed, its material, and on the mass of the pier, its fender system and its material. The designer must consider where he wishes to direct the damage or the cost of maintenance. There are two systems directly opposed in principle. The first is to build of materials of such elasticity and make up as will absorb the average service blows with very small damage. Usually this takes the form of elaborate timber framing with fender piles, sometimes backed with coil springs. The exposed points are usually protected with large groups of closely-driven piles. However, this protection fails with a square blow of a vessel under headway and usually results in expensive damage to the pier.

The other system is to build of simple concrete masses or reinforced concrete of such amount and rigidity that boats strike the pier at their own peril. Here a premium is put on solidity and mass. Vessels can and do much damage even to these structures, but greater damage is usually sustained by the boat. This tends to increase the skill and diligence of the captains, lessening the frequency of such accidents and usually leaving the structure in a shape to be easily repaired after a destructive blow. Such structures usually only have a rubbing waling strip of oak timber or fender pads of 12-in. by 12-in. timber hung over the side. Timber piers usually are not adapted to the second system because they are lacking in mass and rigidity, hence some form of the first system is used.

Where passenger service is rendered by the pier, the second system is not advisable because of the effect of a smashing blow of impact with the pier on a large crowd of people on the boat. Rightly here practice has developed elaborate systems of cushioning the blow and letting the damage be done to the dock.

The case of a submerged wall with water on both sides where filling is put in back may lead to a little confusion. If the water stands at the same level on both sides of the wall the hydrostatic pressures are balanced. The material filled in back of the wall usually weighs more than water, even after allowing for the buoyant effect of the water. This gives an added pressure on the side of the wall equal to the horizontal pressure of that material with its slope angle of repose under water and its reduced weight. The effect of the water is to decrease the angle of repose of the material and the effective weight. Decreasing the angle of repose increases the horizontal pressure and decreasing the effective weight lessens the horizontal pressure. If the material lies fair against the wall so that the hydrostatic pressure has no area to press against, the effective hydrostatic pressure on the inside of the wall will be zero, but in practice a film of water will lie next to the wall except at a few points which transmit the pressure of the filling itself.

Piling, piers and original ground which stands at greater heights than the bottom of the adjacent channel tend to reduce the pressure exerted against the inside of the wall. The amount of the reduction is a subject for careful judgment in each case. Because of this reduction, it is some-



times possible to leave out intermediate supports on sheet piling, using only secure anchorages at the top and a sufficient length of imbedment at the bottom.

In the early days of wharf building the driving of a strong pile sticking up through the deck three or four feet formed a satisfactory mooring post when boats were smaller and the attaching lines had a horizontal pull, but with the increase in the size and height of vessels which mean a high inclination of the rope with a tendency to slip off the old straight side posts, have come cast-iron posts with various shapes to overcome the slipping. All of these posts require suitable foundations with hold-down bolts to take care of the lift. With the addition of steam winches on the boats to warp them along the piers in loading, it has been found advantageous to have mooring posts at frequent intervals along the front of the pier. It is well also to have a few posts further back from the front to fasten mooring lines at less inclination for such work as pulling the boat closer to the piers. As a matter of safety, it is necessary that some form of curbing or foothold should be provided along the front of the pier for the men receiving the mooring ropes to prevent their slipping and being pulled into the water.

SUPERSTRUCTURES CONSTRUCTION

The superstructures of many wharves constructed during the past few years are of a composite character. Timber, concrete and steel are used in various combinations, and there seems to be great diversity of opinion as to the best practice. Timber structures are generally decked by cutting off the piling to the proper level, capping them with standard sized timbers and placing a plank floor, securely spiked to the caps. This form of deck is very satisfactory for wooden structures and, up to the present, on account of the low price of timber, has probably returned more on the investment than would have been produced by any permanent form of construction. In the past few years some designers have placed concrete decks on timber structures and others have used concrete with asphalt wearing surface. It would seem that either of these methods of construction were hardly satisfactory. Concrete or asphalt decks should be placed on filled or permanent structures so they will not deteriorate rapidly from the action of an unstable foundation.

The superstructure of many wharves is of very simple construction, being principally a more or less extensive roof supported upon posts from the foundation. Of late years many fine examples of steel and concrete buildings have been erected and the tendency in all the large shipping centers, at the present time, is to erect structures of this character. The danger of fires and the tremendous loss incident to the destruction of wharves and their contents, as well as the loss that may entail on shipping in the immediate vicinity, has been a very decided factor in producing a permanent form of construction. The constant rise in prices of timber in all forms and the lower prices of steel and concrete is making it more feasible to put up fireproof structures of permanent design.

ECONOMY CURVES

The formula for these curves is given with the curves. By assuming that n and m have a fixed ratio and using various life periods, it is possible to calculate values of f for each ratio of life periods and different lengths of life. By plotting these values of f and joining points calculated for the same ratio of life period, we get curves showing values of f for any life period within the limits of the curves. For convenience those of even life ratio were plotted. For any fractional ratio of life period values of f can be found approximately close by interpolation between the appropriate curves. The curves start at zero life and ratios of cost equal to the ratio of life period and approach the

ratio one as the life periods lengthen until at infinity $f =$ one, irrespective of the ratio of cost at the start. The curves are calculated with the interest rate at 6 per cent, but the principle would be the same whether we used 3 per cent, 4 per cent, 5 per cent, or 6 per cent except that the higher the rate the more rapidly do the curves fall to the ratio one.

By a study of the curves it will be seen that a larger ratio of first cost is justified for short life structures than for long life structures even if the ratios of life periods are the same. It will be seen that every additional year which we can add to the life of the lesser cost structure lowers the ratio of justified cost of a longer life structure, even though the longer life structure does last the same ratio of life. For example: Treated timber with a life of 25 years and steel of 50 years have a justified cost ratio of only 1.23 and even if we were to get infinite life from the steel a cost ratio of only 1.30 is allowable. This does not prove the steel should not be used, but indicates that where steel is used some other important factor such as maintenance of fire hazard must be the basis for spending a greater amount.

METAL ALLOYS USED IN LOCOMOTIVES*

By G. L. Hoyt

Assistant Professor of Metallurgy, University of Minnesota.

Every railroad man who is concerned with the design of a locomotive knows that heat-treated steel has better properties than annealed steel, for by heat treatment we are able to produce certain properties that can be produced in no other way. I have found, however, in talking with various railroad men, that the chief reason they are not ready to adopt heat-treated parts is that heat-treated steels do not stand up any better than ordinary carbon steels, and that in some cases special steels give more trouble than ordinary carbon steels. The reason given is that the producers of these parts are not in a position to heat-treat material of that quality on a commercial basis to sell for such a price that the railroads can effect an economy in buying. At present the practice is to merely anneal the various parts. A locomotive axle will be forged from an ordinarily good grade of open-hearth steel. After forging it is heated to the critical point and allowed to cool in the air slowly. The object, I take it, is to insure uniformity and to remove internal strains. Whether or not a satisfactory structure is produced is of entirely secondary importance. When I mention internal strains, I give the reason why heat-treated steels are not used generally in locomotive practice. There can be no doubt about the advantages which they possess over ordinary carbon steels, and if it is impossible at present to obtain heat-treated steels for locomotive construction, something should be done about it.

If I can read the signs of the times correctly, there is a necessity for all the economy possible in railroad operation, which is why the question of using heat-treated steels in locomotive construction is becoming more and more important. It is possible to produce steels that far surpass those now entering into locomotive construction. In gun construction the United States Government and the steel plants got together and are now successfully manufacturing heat-treated gun parts. Hadfield projectiles are probably the most difficult to produce satisfactorily of all materials made of steel, the internal strain serving to weaken the resistance of the material. What has been done in other cases can be done in regard to any part about a locomotive. I can see nothing inherently difficult about heat-treating locomotive parts. Whether or not the methods for doing this are developed depends upon the demand made upon the steel plants by the railroads to produce the desired material. If the roads feel that there would be an economy in using heat-treated parts, undoubtedly

*Abstract of a paper read at a meeting of the Minnesota Section of the A. S. M. E.

The saving effected by using special steels results chiefly

The advantages of a scheme of this kind are many. The voucher contains all the bills rendered during the month, and serves as a check at once upon all the invoices that may be outstanding. The account is complete and upon payment is cleaned up entirely. There is no fear of overlooking mislaid invoices, of forgetting invoices in process of being checked, or of invoices being too long delayed for payment. The railway, further, receives at the end of the month a complete record of its bills outstanding, and can easily determine where it stands at all times.

TRAIN HANDLING *

By G. H. Wood

General Air Brake Inspector, Atchison, Topeka & Santa Fe.

To prevent, as far as possible, damaging shocks in long trains, due to brake applications, it is necessary that the percentage of braking power be as nearly uniform as possible on all cars, and that loaded and empty cars be so distributed in trains that the greater part of each will not be at the head end or rear end. It is, of course, not practical generally to alternate loaded and empty cars throughout trains and the best that can be expected in this respect is to place part of the empties ahead and part of them at the rear, placing at least one third of the empties in the head end of the train, and the balance behind the loaded cars. This does not mean that in short trains, say 25 or 30 cars, and where there are only a few empties or loads that this procedure is necessary; but on long trains of 40 cars or more where about one half are loads, it is advisable to place the loads and empties as above suggested. This provides a means of distributing the braking power so that reasonably good handling of the train can be expected.

It is, of course, important that piston travel be properly adjusted on all cars in any train. This feature has been dwelt upon more or less by those concerned in brake maintenance. Long piston travel is preferable to short piston travel, that is, 7 in. standing travel will provide much better handling trains than 5 in. standing travel with the same brake pipe reduction, because in the former case the cylinder pressure will be built up more slowly and consequently any movement of slack in the train will take place proportionately slower, with a reduction in the velocity difference between cars and the stresses set up on account of such; and while there will be a considerable difference in the cylinder pressure between a 5-in. and 7-in. piston travel at the beginning of a brake application, the pressures will be nearly equal when the brake is fully applied. An idea of the shocks produced in trains may be gathered from the following statement:

"It is not infrequent that a velocity difference of one mile per hour is set up between cars at different points in a train, due to grade conditions or loaded and empty cars, during brake applications. With the present standard freight brake, the empty car tends to retard at about three or four times the rate of the fully loaded car, and if a heavy service reduction is made, if the loaded cars are toward the head end of the train, the ordinary slack between cars provides a means of stretching the train to such an extent that the stresses run around 300,000 to 400,000 lb.; hence it becomes plain why a draft gear yoke, capable of sustaining the weight of its own car, or even a number of such cars if suspended vertically, is so easily broken in service; also why so many damaging shocks, due to slack action, occur every day, with the great diversity in car loading, train make-up, grade conditions, brake conditions, etc. However, if a light brake pipe reduction be made the braking force will, of course, be reduced and the velocity difference between cars in the train will be reduced correspondingly, with a corresponding reduction in stresses set up between cars in the train."

You will note that the statement is made that if a light brake pipe reduction instead of a heavy one be made that the braking force will be reduced and the velocity difference between cars will be correspondingly reduced; however, it is assumed in the above case that the piston travel is near 8 in. standing travel, so that it is possible to produce a low cylinder pressure, since with 7 in. piston travel a 10 lb. brake pipe reduction produces 30 lb. cylinder pressure, and a 5-in. piston travel produces 45 lb. cylinder pressure, with

the same brake pipe reduction. Note that in the case of the short travel the brake is nearly fully applied, if 70 lb. brake pipe pressure is the standard carried. A 5-lb. brake pipe reduction produces about 7 lb. cylinder pressure with a 7-in. piston travel, and the same reduction with a 5-in. travel produces about 17.5 lb. cylinder pressure. The rate of retardation due to brake applications depending upon the rate at which the brake cylinder pressure can be built up, it will be seen that with short piston travel, say 5-in. or less, a high rate or retardation is possible, because a 10-lb. brake pipe reduction produces 45 lb., a high cylinder pressure. It is true that the longer brake pipe on long trains automatically increases the time in which it is possible to effect any given brake pipe reduction over that obtaining for a short train. At the same time the longer brake pipe increases the time between the beginning of brake application on the head end and rear end. Now if the piston travel is short, say 5 in., it is possible to develop a high brake cylinder pressure at the head end with a 10 lb. reduction before the beginning of brake application at the rear. This causes the slack to run in from the rear, sometimes with very damaging results if the speed is low, because it is possible to produce sufficient braking power on the head end of a long train to stop the head end before the brake application begins at the rear end. This results in a collision between the two ends of the train. However, if the piston travel be long, say 8 or 9-in. standing travel, it is possible to make the same reduction and only produce 20 to 25 lb. cylinder pressure, less than one-half the pressure produced with the short piston travel. This reduces the rate of retardation set up on the head end of the train, and consequently the severity of any slack action due to a run-in of the slack. Lighter brake pipe reductions still further reduce the cylinder pressure developed, until the train can be controlled without any noticeable slack action.

The above serves to show that it is possible for the man engaged in brake maintenance to provide a brake condition that is difficult to handle, and one that contributes to rough handling; or to provide conditions that are quite the reverse, so far as piston travel is concerned; also that the old idea that the piston travel should be very short, to provide a quick acting brake and more braking power for light reductions is entirely wrong for long train operation.

As indicated in the foregoing, the engineman should avoid heavy brake pipe reductions at any one time in handling long trains. He is in a measure at your mercy in this respect, since once the triple valves are moved to service position, any reduction of brake pipe pressure causes a further increase in brake cylinder pressure. The rate of brake pipe loss or reduction due to leakage should be kept as low as possible, and should not exceed 5 lb. per minute after a 15 or 20-lb. brake application from 70-lb. pressure.

Numerous cases of damage in handling trains are traceable to the manner in which the train is operated by train and enginemen; however, cases are recorded where damage occurs due to other influences, and in order that this association may lend its efforts to lessen such cases the car department should be notified promptly of any case of trains leaving the terminals coming uncoupled due to defective drawbars or appliances, or breaking-in-two due to weak or defective draft gear, in order that these matters may be taken up promptly with the head inspectors so that they will realize the importance of doing everything possible to prevent cars coming uncoupled due to mechanical defects. In making up trains, cars having weak or defective draft gear, if not repaired, should be handled toward the rear of trains, and it is important that yardmen be instructed to place cars in the rear of the train when so notified by inspectors or when the cars are properly carded by them.

Any efforts directed toward providing good brake conditions tends to reduce the rough or improper handling with

* From a paper presented before the Car Foremen's Association of Chicago.

a resultant reduction in shocks that contribute to loss and damage.

In order to assist in the inspection of draft gear and brake conditions, and also keep the slack in draft gear at its minimum, freight trains should be stretched on their arrival at all terminals. This requires the incoming brake test to be made as follows:

On stopping the train, where it is to be left in the terminal yard, the brakes should be released and fully charged, sufficient hand brakes should be applied at the rear so that the slack may be gently pulled out on the entire train, after which the air brakes should be applied with at least a 20 lb. service reduction. The brakeman should not close any angle cocks until such application is completed. Inspectors should, of course, be on hand to inspect for brake and draft gear defects as promptly as possible.

Representing a railroad which has some long and heavy grades, I am vitally interested in the question of maintenance of retaining valves on freight cars. Since it may be that some will question the suggestion with regard to avoiding piston travel shorter than 7 in., I wish to state that for grade work if the retaining valve and its connections are kept in proper condition, as they should be, there will be less difficulty in controlling trains on heavy grades than obtains with the short piston travel. Not only this, but with piston travel at 7 in., the roads operating in level territory will have much better handling trains with a consequent lessening of the damage occurring, less trouble due to stuck brakes, and also cracked and slid flat wheels. The question is one that is worthy of considerable thought and also one that should be given a great deal of consideration and attention by those who are directly concerned in the maintenance of brakes.

I understand that M. C. B. recommended practice with respect to piston travel is at present $5\frac{1}{2}$ to 7 in. This, however, should be changed, in my opinion, to, from 6 to 8 in., making 7 in. the standard adjustment. I do not wish it understood that I favor a brake condition that will lessen the safety of train operation. On the other hand I am thoroughly convinced that for the operation of long and heavy trains with the pneumatic brake, sooner or later a move in the direction of overcoming the time element inherent in pneumatic brakes will be made. This does not necessarily involve the operation of the brake by electrical means, but rather by timing the application of the brake in its initial stages, thus allowing time for the tremendous forces existing in heavy trains to adjust themselves gradually before a high rate of retardation is produced. This, I feel, is necessary for both the service and the emergency brake application. The nearest approach that can be made to such an installation with present equipment is to maintain the piston travel slightly longer than is the present practice throughout the country. I have for the past several years recommended such a change and understand that at the present time this suggestion is being tried out on various lines, particularly in passenger service, with very satisfactory results. It is much more necessary for freight service, where the trains are so much heavier and consist of a greater number of cars.

ECUADORIAN BONDHOLDERS LOSE SUIT.—Judge Augustus N. Hand, of the Federal District Court of New York, has dismissed the suit brought against Speyer & Company and the United States Mortgage & Trust Company by Erskine Hewitt on behalf of himself and all other bondholders of the Guayaquil & Quito Railway. The action, which was filed on January 2, 1899, was designed to impress a lien upon money in the possession of Speyer & Company. The litigation grew out of contracts made by the government of Ecuador in 1897 and 1898 for the construction of a railroad from the port of Guayaquil, in that country, to Quito.

MOTOR TRUCKS REPLACE TRAP CARS

For about three months the Cleveland, Cincinnati, Chicago & St. Louis has been handling less-than-car-load freight between its sub-stations at Front street, Sixth street, Brighton and Ivorydale and its main station at Central avenue, Cincinnati, by motor trucks in place of trap cars. These motor trucks have been installed to release the freight cars now in this service for main line use; to increase the present station rail facilities; to increase the capacity of the present freight house by securing a more continuous movement of freight at the main and sub-stations and to decrease the liability for loss and damage.

The equipment in this service which has been installed jointly by the Motor Terminals Company and the railroad consists of one 5-ton White motor truck chassis, nine removable truck bodies with a capacity of 5 tons each, 12 sets of lifting chain hoists and five overhead superstructures. The plan of operation is to distribute these movable truck bodies at each of the four sub-stations and the main station. In outbound service they are spotted on the floor of the freight house or left suspended under the super-structure in the drive way so that freight can be loaded directly on them by the shipper instead of being placed on the station floor. In this way the rehandling of the freight over the floor to the out-bound car is eliminated. With in-bound traffic the



Motor Truck Chassis With Removable Truck Body and Chain Hoists

freight is trucked directly from the car in which it arrives over the platform into the truck body for the proper sub-station. When these truck bodies are loaded they are ready for movement at once over the streets to the main or sub-stations.

After a truck body is loaded and ready for shipment, an average of only five minutes is required to transfer it to and from the motor truck chassis. With this arrangement the motor truck can be employed continuously in transferring these bodies with their contents from one freight house to another. In this way the single truck has handled as much as 84 tons of freight in one day. The average load of each truck body is 4.55 tons. Investigation showed that trap car movements require an average of $1\frac{1}{2}$ days while with this system of motor transportation the haul of a trap car load of 9 tons of freight within a $9\frac{1}{2}$ mile radius and with an average haul of 3 miles is made in 1 hour and 24 minutes.

The use of this system of freight transference has resulted in advancing trap car freight movement 24 hours, as 88.4 per cent of this trap car freight reaches the main station in time for loading into line cars the same day or is delivered to the sub-stations in time for delivery to the

consignee. It has also made available for other service eight trap cars daily and has eliminated the expense of switching these cars. It is estimated that the floor capacity of the stations has been increased 4,860 sq. ft. or 40.8 per cent. The rehandling of the freight passing through these stations has also been reduced over 50 per cent daily.

In estimating the cost of this service as compared with trap cars the contract price per ton of freight handled, the labor cost for truckers and operators and the interest and depreciation on the investment in the superstructure were compared with the charges for switching, per diem, labor and interest and depreciation on the box car equipment. In spite of the fact that one truck with its disproportionately heavy overhead charges has been compared with the pro rated operating cost of a large road, the results have convinced those in charge of this development that it is economical. It is now planned to present these figures to the other roads in Cincinnati with the idea of extending this service to the interchange of freight between roads.

COMING MAINTENANCE CONVENTIONS

The programs for the meetings of the three associations in the maintenance of way field, which will be held in September and October have been prepared and well attended and profitable conventions are anticipated. These associations are the Roadmasters' and Maintenance of Way Association, the American Railway Bridge and Building Association, and the Maintenance of Way Master Painters' Association. According to the programs, entertainment will form a minor feature of the various meetings, the subjects for discussion being selected for the most part with a view to their pertinence at the present time.

THE ROADMASTERS' CONVENTION

The convention of the Roadmasters' Association will be held at the Auditorium Hotel, Chicago, September 18-20, inclusive. The program for this meeting appeared in the *Railway Age Gazette* of July 20, page 102. Arrangements for the exhibit of the Track Supply Association to be held in connection with this convention are taking form, 47 firms having already arranged to present exhibits. A list of these companies is given elsewhere in this issue.

THE BRIDGE AND BUILDING CONVENTION

The American Railway Bridge and Building Association will hold a convention at the Hotel Sherman, Chicago, October 16-18, inclusive. The place of meeting was changed from St. Paul, previously selected, to Chicago because of the more central location. The program in detail is as follows:

TUESDAY MORNING, OCTOBER 16

- 10:00 a. m.—Convention called to order by president. Opening business and reports of officers.
- 11:00 a. m.—Committee report, Economical Delivery of Water to Locomotives.

AFTERNOON SESSION

Economical Methods of Handling Work Under Present Conditions

- 2:00 p. m.—Committee report—Erection of Plate Girder Spans with the Least Interruption to Traffic.
- 2:45 p. m.—Committee report—Repairing and Strengthening Old Masonry.
- 3:15 p. m.—Committee report—Paint and Its Application to the Exterior of Railway Buildings.
- 3:45 p. m.—Committee report—Fireproofing the Roofs of Wooden Buildings.
- 4:15 p. m.—Committee report—Encasing Girder Bridges in Concrete.
- 4:45 p. m.—A paper—Snow Sheds.

Tuesday evening has been set apart to pay tribute to the memory of Samuel F. Patterson, late secretary emeritus.

WEDNESDAY MORNING, OCTOBER 17

The Labor Problem

- 9:30 a. m.—Committee report—How to Secure and Hold Bridge and Building Men.
- 10:00 a. m.—Committee report—Housing and Feeding Bridge and Building Maintenance Crews.
- 10:30 a. m.—Committee report—Uniform Rates of Pay Versus Differential Rates for Experienced Men.
- 11:00 a. m.—Committee report—Small Versus Large Gangs for Maintenance Work.

- 11:30 a. m.—Committee report—Labor-saving Equipment, Including Hand-operated Devices for Lifting, Pulling and Hoisting.

WEDNESDAY AFTERNOON

The Material Problem

- 2:00 p. m.—Committee report—How Can We Best Meet the Present Bridge and Building Material Situation?
 - (a) With Reference to Bridge and Structural Steel, by Albert F. Reichman, Division Engineer, American Bridge Co., Chicago.
 - (b) With Reference to Building Materials.
 - (c) With Reference to Water Service Materials, by C. R. Knowles, Superintendent of Water Service, Illinois Central.
- 3:30 p. m.—Committee report—Conserving the Supply of Materials by Intelligent Reclamation.
- 4:00 p. m.—Committee report—Shipping Company Materials Economically by Loading Cars to Capacity and Unloading and Releasing Them Promptly, etc.
- 4:30 p. m.—Committee report—The Bridge and Building Material Yard.
 - (a) As a Separate Organization.
 - (b) As a Branch of the Stores Department.

THURSDAY MORNING, OCTOBER 18

- 9:30 a. m.—Call to order. Unfinished and new business. Election of officers and selection of meeting place for 1918. Adjournment.

THE MASTER PAINTERS' ASSOCIATION

The Maintenance of Way Master Painters' Association will hold its annual convention at Cleveland, Ohio, on October 16-18, inclusive. The program, covering subjects that are of special importance at this time, is given in part below:

TUESDAY, OCTOBER 16, 10:00 A. M.

Opening Exercises

2:00 P. M.

Painters and Painters, C. F. Loweth, chief engineer, C. M. & St. P., Chicago, Ill.

Opening of the Question Box

Interior Wall Coatings, C. H. Hall, general superintendent Patton Paint Company, Milwaukee, Wis.
Methods Employed in Protecting the Public from Paint During the Renovating Period, H. B. Wilson, master painter, B. & L. E., Greenville, Pa.

WEDNESDAY, OCTOBER 17, 9:00 A. M.

Committee report Painting of Water Tanks, Bert E. Darrow, master painter, A. T. & S. F., Kansas City, Mo.
Open discussion: Painting of Danger Lines on Station Platforms.
The Volume of Maintenance of Way Painting, W. S. Lacher, managing editor, Railway Maintenance Engineer, Chicago, Ill.

THURSDAY, OCTOBER 18, 9:00 A. M.

Committee report—Painting of Bridges, H. S. Bird, master painter, P. & R., Philadelphia, Pa.
Finishing of Floors, H. B. Wilson.
Efficiency, Economy and Safety First, H. F. Jones, master painter, Big Four, Wash., Ind.

2:00 P. M.

Metal Protection, Philip L. Maurey.

Committee report—Material and Labor Reports, W. J. French, master painter, N. Y. O. & W., Middletown, N. Y.
Answers and discussion of questions from question box.
Closing business.

MILITARY RAILWAY CONSTRUCTION.—It is common knowledge that the British army alone has constructed and is operating a very considerable mileage of standard and narrow gage railways behind the firing line in France, and brief particulars are occasionally made public in the course of ministerial speeches in the House of Commons. Under existing conditions, technical details of these lines are, naturally, not available, and it is to be hoped that after the war data as to construction, maintenance and operation will be placed at the disposal of railway men. The facts relating to operation should be of especial interest. As regards construction, it is to be noted that while quick track-laying is essential in the case of military railways in or near the actual fighting area, the lines must at the same time be built to accommodate heavy traffic, and the axle-loads are very considerable where big guns and high-calibre munitions have to be conveyed, so that much of the standard gage mileage is heavy. This is especially the case in the newest construction. Military railways often vary in details from those built for ordinary commercial traffic. For instance, on a military line "somewhere in England" keys are dispensed with, the rails are flat-bottomed and of T-section, and are secured to the sleepers by dog spikes.

THE FIRST RAILROAD IN ALBANIA

By Our Special European Correspondent

A pair of steel rails today marks the continuation in the Balkan peninsula of the Via Appia, Queen of Roads, the historic example of the lasting nature of the work of the great Roman Empire.

After 2,229 years, the Italians, geographical inheritors of the ancient empire, have taken up the lost thread of the Via Appia on its way to the orient and there built, in Albania, not of stone but of steel, a road which will connect Rome with Athens and Byzantium (Constantinople). The Italians have rebuilt so far from Vallona along the route once known as the Egnatian section of the Via Appia. In ancient times the Via Appia had its starting point at the Gate of Capenza, at the foot of the Palatine Hill, in Rome, and thence wound along to Capua, thence to the modern Brindisi, refound itself across the Adriatic at Durazzo, capital of Albania, and thence drove along the shore above Vallona. Today the Italians plan to have the road begin at Vallona, connecting directly by boat with Brindisi.

In this war the Italians have followed the example of the old Romans. Wherever they have gone, they have not destroyed but reconstructed, built for the future, built roads,

peninsula on their way to the Orient, whereas the other powers wished to maintain the peninsula as a territory thrown across the path of Central Empire progress. Despite her poverty in money, the dominant party in Italy wishes actually to re-establish the country as the ruler of the Mediterranean, and the Balkan policy is to form a federation of all the discordant racial elements and make the peninsula prosperous and powerful. This will take many, many years, and in the meanwhile Italy plans to rule the Adriatic, rather than let the Austrians do it. A part of this rule means the possession of the coasts of Albania. And while we are about it, say the Italians, why not make Albania prosperous, why not build roads and railroads? In the entire peninsula there are some 6,300 miles of railroad, mostly French built. But Albania, until the Italians came, had not a foot of railroad.

Some of the most interesting and difficult land and sea transportation the world has yet seen has taken place in the Mediterranean since the war began, first the movement of the English to the Dardanelles, then that of the French, chiefly, to Salonika, and more lately that of the Italians in Albania.

Albania, it must be understood, though fertile in soil in spots, has for centuries been well-nigh forsaken. Wild



The Dock in Albania From Which the Narrow Gage Line Started

bridges, railroads, model camps of steel and concrete buildings, all of which will last and be useful to peace long after the war has ended. This has been particularly true regarding the mountain country of the Alps which they have wrenched from the Austrians, and during their brief year in Albania they have continued the civilizing work begun on their principal battle front.

There is considerable business and politics behind this railroad and reconstruction work. The political and military story of Italy's reasons for being in Albania has been told since Minister of Foreign Affairs Sonnino surprised Europe this summer by formally announcing Italy's occupancy of Albania and its intention to continue a protectorate there. Those unfamiliar with the fine points of European politics can hardly see how the occupancy of 11,000 square miles of territory, about one-third the size of Iceland, and at present not as rich, except for a troublesome population of three-quarters of a million, can cause much excitement among nations. But it must be remembered that the cause of this huge war began in the Balkans, because of its unsettled partitions of land ownership, because, broadly, the Central Empires wished to overrun the whole

nature was here coupled with wilder bands of robbers. A few years ago, in 1913, the Austrians made a deal with the Turkish rulers and set up William Frederick as king. Then, possibly acting for the Italians, Essad Pasha in October, 1914, proclaimed a republic with himself as president. Latterly he simply picked up his scant baggage and departed towards Southern France, after the horrible mid-winter retreat of the Serb army down the Albanian mountains, together with their Austrian prisoners.

The transportation of this body of starving men from Albania to the island of Corfu marked the beginning of the actual Italian occupation. Considering the submarine danger and their other normal war difficulties, it was quite a notable transportation job, that of handling 150,000 sick and disabled men. Cholera broke out among them, and in February, 1916, while the transfer to the island of Corfu was fairly well begun, two Italian ships, the *Re Vittorio* and the *Cordova*, each lost 500 men of this disease in the brief journey. The organization of the ports had been so rapidly and securely improvised that on certain days, for instance February 6, 1916, no less than 9,700 men were taken away from Durazzo—and this in the face of frequent submarine

attacks. Now that we ourselves have to handle soldiers, we can better appreciate the feat.

The handling of these Serb troops is a small part of the land and sea transportation done by the Italians for their allies. Just how many hundred thousand English and French have been carried over the Italian railways down to Brindisi and thence either by sea or land to Salonika cannot be stated; but it must be set down to their credit that, with a railway system certainly not up to the American standard in normal times, during the war occupied with its own millions of men and their freight along its Alpine front, with a system approximately of the size of the Chicago & North Western, these Italians have done pretty well. It will be remembered that in northern France the railway situation was relieved by the English, who put on their own trains, their own railroad men, and rebuilt tracks. In Italy they have gone it alone.

The results obtained by the navy afloat in these transportation matters, of course, depended on the organizing of the port of Brindisi with new dock, modern methods of handling freight quickly, including building broad and narrow gage railways right down upon the docks, and also organizing the new port of Vallona in the same way.

When the Italians first went into Albania, with Vallona as their selected base, after having deserted Durazzo to the Austrians, their engineers realized that they must build a railway in order to penetrate into the interior in the direction of Monastir and eventually Salonika. When the land was not flat and swampy, it was made up of impossible hillsides, without roads other than the muddy paths traced by the horse-riding and dry weather Albanian carters.

So, before a stone road was built, a narrow gage line was laid, first operated by handcars and horses hitched to the cars. With this primitive railroading artillery and army baggage was distributed through Albania, stores, materials for building army camps, and all the other heavy freight that cannot be carried on the back of men was thus gotten forward. In the wake of this wobbly little line came the

the central station of Vallona and running to the Vojussa river which describes an arc up from Vallona. For the present, the great highway, now that it is completed, reaching from Santi Quaranti towards Delvina, Lerisovic, Erzeke, Koritza and Florima, appears the more important, permitting wagon and automobile communication between the Adriatic sea and the Orient.

But all the workers and visitors to Albania say that it is the narrow gage which has taken Albania out of the class of musical comedy countries, and given it a solid civilizing foundation. When the Italians came to the country there was nothing there, absolutely nothing but the ground upon which they walked. There was not even a sand road from



A "305" Gun En Route for Albania

the town of Vallona down to the sea. The town itself consisted mostly of a name attached to a few straw-thatched wooden houses and a few Turkish mosques. The coast was naked, the back-country was naked, and the people nearly so.

After a little dock had been built, a road hastily laid out to the town, the ships disembarked their sailors and soldiers who went to work on the narrow gage. Then it was roads, and roads, and more roads, always pushing up country. One of the Italians told me how the Albanians first acted about this road business. "They looked on the narrow gage as the machinery of the devil that the crazy Italians were putting up. The women and children took to the tall grass, and the men would have gotten their old muskets into play had they dared. When the roads began to be passable, the natives carefully avoided using them, keeping their little mules to the cross country paths, for a time, looking with complacent irony on this useless work of civilization, but finally the easy-going interested them and the bridges across the streams got them."

Today school children walk over these roads and ride on the narrow gage, since the Italians have established 120 schools. In the wake of the army have come not only aeroplanes and automobiles and heavy artillery but real food and real clothes, Red Cross outfits with gentle born Italian nurses, and all these things are applied for the benefit of the Albanians. American and English charity has for many years vainly occupied itself with the unfortunate Albanians, ruined by Turkish rule, and today their hopes have been realized by the civilizing influence of a well ordered army occupation, which itself had a tiny narrow gage as its backbone.

INDIA'S RAILROAD RESOURCES FOR WAR.—India has already supplied for purposes of the war 900 miles of permanent way and rolling-stock, including some 120 locomotives and 50,000 cars.



A Railroad and Telegraph Station in Albania

solid macadam road, permitting army carts and wagons to move, and troops to march with ease. Generally, it is the other way about. First comes the wagon road and then the railroad. As the country was gradually opened up by this first penetration line of tracks, more attention has been paid to the railroad and from a narrow gage, it is being turned into the so-called colonial gage used in the North African colony of Libia.

No less than 250 miles of good, solid road has been built to date in Albania, thanks to the first penetration narrow gage line, which itself is but 60 miles long, originating at

RIVET CUTTING GUN

An important factor in the repair and reconstruction of steel cars is the cutting of rivets. The inaccessibility of many of these rivets makes their removal more or less awkward when the work is done with a sledge and chisel. The Rivet Cutting Gun Company, 220 East Second street, Cincinnati, Ohio, has developed a device for cutting rivets that has been found serviceable in steel car work. With it is



Rivet Cutting Gun Being Used in Steel Car Repairs

provided a long cutting bar for use on the sides of cars and in inaccessible places underneath cars; in fact, the machine can be used wherever a rivet is to be removed. A punch is also provided to knock the rivets out after the heads have been cut off. The illustrations show how it is used for cutting rivets from the top of gondola cars, a 5-ft. bar be-



Removing Rivets from Drawbars with the Rivet Cutting Gun

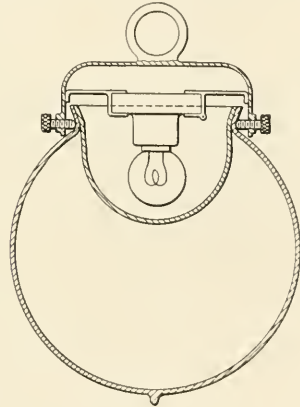
ing used in this case. This eliminates the necessity of scaffolding and provides a quick means of removing the rivets. The second illustration shows the rivet gun being used for cutting 1¼-in. steel coupler yoke rivets. In this case the work is done in the yards, it being unnecessary to carry the

coupler to any machine. This machine is also used for straightening bent plates on steel cars and in punching holes for various purposes.

This device weighs 71 lb. and is usually handled by three men, as indicated in the illustrations. It has been in use on one railroad for over a year; it has been found that three men with this tool can cut off 4,000 rivets in nine hours; this with a sledge hammer and bar would require four men four times as long. It is also reported that in working on a high side steel hopper car, which was wrecked, and which involved the removal of the center sill and attachments, the coupler, the hopper doors and all air attachments, 1,143 rivets of from 5⁄8 in. to 7⁄8 in. in diameter were cut off and backed out in 7¼ hours. This rivet gun can be operated with an air pressure of 55 lb., but 75 to 100 lb. is recommended for heavy work.

DODDS' STORED LIGHT

A means of storing and conserving light has recently been discovered accidentally by Ethan I. Dodds, who is associated with the Flannery interests of Pittsburgh in an engineering capacity, while experimenting on an appliance to enable the blind to see shadow pictures through the use of radium. Mr. Dodds found that by coating the interior of a globe with a certain mixture and subjecting it to the light, the coating would absorb light, which, when the source of



Dodds' "Cold Stored" Light

light had been removed, would provide a certain amount of illumination. One interesting feature of this light is that it dissipates no heat.

The arrangement shown in the illustration is one of the experimental types of the "cold stored" light units made by Mr. Dodds. It consists of double glass globes, the inner surface of the outer globe being coated with the light retaining element. The secondary globe is sealed in the mouth of the outer one and is, of course, transparent. When light is flashed from any source whatever, it is absorbed by the inner surface of the outer globe. More effective results are obtained, however, when the light which is flashed is placed in the secondary globe as shown in the sketch. In this case it is a common incandescent lamp. With this arrangement enough light will be absorbed by the outer globe from five seconds' illumination of the incandescent bulb to provide a considerable amount of light for a period of 10 to 15 minutes. Although this light will not be strong enough to use for reading purposes, it will provide sufficient illumination to readily discern objects in a dark room.

The intensity of light, of course, will gradually reduce until about an hour after the light was first charged it will be invisible in a dark room. It is expected that further experiments will lead to a light which will provide greater intensity, but this may be overcome at the present time by the rapidity of the flashes and the number of the lights.

While the source of light in this particular instance is an incandescent bulb, any source of light can be used which will be strong enough to charge the coating on the inside of the outer globe. Marconi, the Italian inventor, has become much interested in the device and is developing a wireless sparker which can be used in place of the incandescent bulb which is illustrated. In this way, for instance, it might be possible to maintain these lights without any wiring apparatus for subsea lighting in order to enable ships to find their way safely through dangerous channels or it may be possible to use this arrangement in mines. In this case a dim light could be maintained underground by the wireless arrangement in case of explosion or when any defects occur in the regular lighting system.

It is quite possible that numerous applications may be found for this light in railway service when it has been completely developed. For instance, a dim light which did not throw off heat would prove most acceptable in the berths of sleeping cars during the summer months. It might also be used to good advantage in the subways or tunnels, where a strong light was not necessary. If the outer shell of the stored light globe were used in the same way as a frosted or sanded globe for ordinary lighting it would insure a dim light for 15 or 20 minutes if for any reason electric current was cut off.

The possibilities of this light are great where a light of high intensity is not required. When it is considered that a five seconds' flash of the incandescent light will provide illumination for possibly 15 minutes, a great saving in coal and other sources of energy supply can be realized. The fact that this light is given off with no generation of heat makes it very desirable. There are possibilities for its use in submarines, warships and other places where but a dim light is desired with the least possible amount of heat.

RAILROADING IN NO MAN'S LAND

"Building a military railway is not like constructing a transcontinental," says Major Royland Hill, writing to the Montreal Herald from the war correspondents' headquarters with the Canadian army in France. Major Hill continues:

You don't quite know what the route will be and your right-of-way has to be purchased with blood and shells. But you have to make a road bed and string rails just as swiftly, perhaps more so, for the penalty clause in the contract is defeat.

I couldn't find the colonel of the Canadian railway battalion I visited. He was somewhere out in front among the field ambulances where disgruntled German shells were still bursting, locating the grade for his next section, through the quagmire of a much-fought-over No Man's Land. But the adjutant was there, in a battered estaminet which had been, until yesterday, an advanced dressing station. His painter—they carry painters and divers, too—had changed the Red Cross symbol into the sign that means Canadian Railway Construction Corps, and which has a Canadian brigadier whose name is a textbook in railway construction at its head. The adjutant had his ear glued to the telephone and he was asking how his trains of material were coming along.

When you at home read that "the guns were being brought up satisfactorily," and that there "have been heavy rains all day," you picture struggling teams of horses dragging batteries into advanced positions.

There are some of the old pictures of war left, but they are few and far between. Sometimes the gun and ammunition have to take the muddy streaks, but if luck is the least with us now they go over well planked roads where hauling is fairly light, and by the time the roads are getting wearily worn of the traffic the railway is there. We learned the value of lumber and railways at the Somme.

On a huge stand, such as you might see at the draughtsman's office at railhead on construction at home, there was a large scale map of what was yesterday "Germany in Flanders." There are blue and red lines which begin behind our old trenches and end nowhere—perhaps on the Rhine. There are the standard gage and the light railways, and they are wanted quickly.

Already this particular two thousand yards of advance had been platted out with little stakes and tapes and the red-tabbed, keen staff captain of heavy artillery was putting the finishing touches to the plan. He had worked with the Canadian adjutant before they both knew what speed meant.

SOME MARVELOUS WORK

If it was easier to build a spur for a twelve-inch howitzer a few yards farther east, the gunner gave the builder the concession and phoned back to get his ranges corrected accordingly. If the gun had to go to that particular spot this Toronto captain would put on another hundred men for the job and build through the crater. There was no argument. Each knew the other knew his job.

Some of the material was already up. British labor parties under the direction of a Canadian major who had worked gangs on the prairies and in the western mountains were out in the shell-pocked area making the first thousand-yard grade.

The new railroad which had been advanced from yesterday was fast filling up with metals, fishplates, spikes and ties. There were just enough for the length to be built. Right and left-hand switches were labeled for the stations and gun spurs where they would be laid. The junctions and stations were sympathetically named after the places, big and little, in the Dominion, where they were torn up months ago and cast into this melting pot of the Empire's war. I am not giving the names that are on the map, but don't be surprised if tomorrow or this week you hear that new Regina, or Le Pas, or even Ottawa has been shelled. There will be a good eight or twelve, perhaps fifteen-inch howitzer to give an account of itself there.

SOME SUDDEN PROBLEMS

"I'll want 200 twelve-inch shells at Ottawa dump tomorrow night," said the gunner captain. "Mind you, the line isn't built yet, and the gun is somewhere back at Vancouver, which is an old, before-the-push station."

"All serene," answered the Canadian adjutant. "I can pick them up at Halifax dump and bring them with the train taking the eight-inch to Oshawa." (Dominion geography is a bit mixed up here.)

It is swift traveling for a newly-constructed line, but then when the combination of railway and artillery experts gets going, things do travel with celerity. If Hindenburg wants to keep away from the big guns he will have to fall back more than five thousand yards in two days.

Thanks to sacrifices by British and Canadian railways, we have plenty of material, and we have the blended brains and labor, too, in these men of modern war, who pave the way for the huge guns and clear the way for the fighting men who "go over."

And when the guns are satiated, among the same lines will come anything from tin huts to house those men in the line, to tin hats to shelter them from shrapnel and tinned bully beef to feed them. There's never any want for traffic on the military railway.

General News Department

A military map of the United States showing the location of every cantonment, camp and training station has just been issued by the Union Pacific.

By direction of the Railroads' War Board, the per diem interchange rate of 60 cents on freight cars is to be continued in force until December 31, an extension of three months.

The twelfth annual convention of the Smoke Prevention Association will be held at the Deshler Hotel, Columbus, Ohio, on September 25, 26 and 27. Practical ways of firing locomotives smokelessly will be demonstrated at that time.

George W. Kirtley, assistant to the operating vice-president of the Erie, and until recently general superintendent of transportation of that road, has been appointed assistant to Robert S. Lovett of the War Industries Board. Mr. Kirtley will assist Judge Lovett on questions relating to the priority of freight shipments, which is Judge Lovett's special duty by appointment of President Wilson.

The Interborough Rapid Transit Company, operating elevated and subway railroads in New York City, has agreed with the Brotherhood of Interborough Rapid Transit Company Employees to pay bonuses, at the end of each month, to employees who have worked at least 22 days in the month, the bonus to be sufficient to make their pay for the month average \$3 a day. This applies to all employees whose regular rate of pay is less than \$3 a day, and the maximum bonus will be \$3 a month.

Edward Chambers, vice-president in charge of traffic of the Atchison, Topeka & Santa Fe, with office at Chicago, who was recently appointed an assistant to Herbert Hoover, United States food administrator, has been given the title of chief of the division of transportation. Fred S. Brooks, vice-president of the Sioux City Terminal Railway, the St. Paul Bridge & Terminal Railway, and the St. Joseph Belt Railway, with office at Chicago, has been appointed chief assistant in the division of transportation.

The United States Civil Service Commission announces examinations, October 2, for the position of senior signal engineer, grade 1, for the Interstate Commerce Commission, for work in connection with the valuation of railway property; salary, \$3,000 to \$4,800. Appointments will be principally for duty in the field. The commission seeks men with thorough technical training and several years' responsible experience; also with a thorough acquaintance with the methods of appraisal and cost estimating of railway signals and interlocking apparatus. Applicants must be graduates of an approved school and have had five years' responsible experience; or, if not graduates, ten years' experience. They must be between 30 and 60 years old.

Zone System of Second-Class Mail Rates

In its consideration of the war revenue bill the United States Senate on August 29 rejected the proposed special tax of 5 per cent on the profits of publishers above \$4,000 yearly, and also the flat increase of 1/4 cent a pound in the second class mail rate. In place of this, as a substitute for the zone rates provided in the bill as it passed the House, the Senate adopted an amendment proposed by Senator McKellar providing for the following zone system of rates, the zones being the same as those prescribed for parcel post; one cent a pound for the first 300 miles, with an increase of one cent a pound for each additional zone up to the eighth, where the rate would be six cents.

Increase in Shopmen's Pay on the Missouri, Kansas & Texas

The Missouri, Kansas & Texas management recently came to an understanding with its shopmen with reference to wage increases. The terms of settlement with the men included a flat increase of 6 1/2 cents an hour to machinists, boilermakers, blacksmiths, sheet metal workers and electricians, and to the helpers in the different trades and helper apprentices. Regular apprentices were

granted an advance of 2 1/2 cents an hour. The increases make the standard rate of pay for machinists, boilermakers, blacksmiths, sheet metal workers and shop electricians for points north of Muskogee, Okla., 50 cents an hour; for Muskogee and points south, including Oklahoma City and McAlester and all points in Texas, 51 cents an hour, and on the Wichita Falls & Northwestern, 52 cents an hour. Machinists, steel metal worker and electrician helpers will receive 30 1/2 cents an hour at all points on the system and boilermaker and blacksmith helpers 33 cents an hour.

Trainmen Honor Former Railway Officer

As a tribute to the memory of Patrick H. Morrissey, formerly grand master of the Brotherhood of Railroad Trainmen, a monument was unveiled on Labor Day at Galesburg, Ill., where he is buried. The monolith, which is of granite, 15 ft. high, was purchased through popular subscription among members of the brotherhood. At the time of his death, last November, Mr. Morrissey was not a member of the B. of R. T., as his membership had ceased automatically when he became assistant to the vice-president in charge of operation of the Chicago, Burlington & Quincy in June, 1913. This is believed to be the first instance in which a railway labor organization has honored a former railroad officer.

Stop the Valuation!

It was about six years ago that the Government undertook what it called a "physical valuation" of the railroad properties in this country. The Observer did not hesitate to go on record as classifying this proceeding as the monumental folly of the age. It now develops that this valuation board has expended all its money and has called for another \$10,000,000. Now is a good time to stop the whole proceeding. It is better to let the money already expended go, with the blessing of a misnamed Government, than to provide additional appropriations to which there may be no end. Of what good has been the valuation so far accomplished at a cost to the Government of \$10,000,000? Congress should set its foot down hard on this proposition for another appropriation.—Charlotte (N. C.) Observer.

7,000 More Cars Distributed

More than 7,000 additional empty cars have been ordered into the South and Southwest to move grain and food products and lumber for the cantonments and shipyards. The orders which the Commission on Car Service of the Railroads' War Board have issued since the policy was adopted of moving empty cars from one railroad to another, regardless of ownership, have resulted in 113,420 cars being distributed where they were most needed.

All of this movement has taken place since May 1. As a result, despite the most terrific pressure ever known, millions of tons of Government supplies, munitions and materials have been transported without a hitch and without interfering to any great extent with the regular commercial traffic of the country which, too, has been increased to vast proportions by the war.

By this latest order, 2,450 cars are to be placed in the grain-producing country, 4,537 additional cars have been sent into the lumber states of the South, and 400 others sent to one of the Atlantic coast lines to provide for an unexpected increase in general freight traffic.

The lines to which cars have been consigned for grain, are as follows: Chicago & Eastern Illinois, 500; Cincinnati, Indianapolis & Western, 500; Wabash, 500; Chicago, Indianapolis & Louisville, 250; Toledo, St. Louis & Western, 300; Gulf Coast, 200. Cars for lumber have been sent to Central of Georgia, 100; Louisville & Nashville, 500; Mobile & Ohio, 350; Illinois Central, 350; Louisiana Railway & Navigation Company, 12; Gulf, Florida & Alabama, 275; Nashville, Chattanooga & St. Louis, 300; Toledo, Peoria & Western, 150; Georgia & Florida,

75; Southern, 500; Atlantic Coast Line, 1,250; Atlanta, Birmingham & Atlantic, 75; Seaboard Air Line, 400; Charleston & Western Carolina, 300.

"Service Stripes" on Santa Fe Cars

"Every railroad in the United States is enlisted in the work of helping to win the war, and hereafter every freight car of the Santa Fe system will wear its 'service stripes,'" President E. P. Ripley said in a recent interview. These "service stripes" will be of red, white and blue of equal width, printed horizontally on cardboard, 12 in. by 18 in. On the stripes is printed in black the freight car's patriotic appeal to its users:

LOAD ME QUICKLY
LOAD ME TO CAPACITY
UNLOAD ME PROMPTLY
AND
HELP WIN THE WAR!

"If anybody thinks the humble freight car is not one of the most important factors in war," continued Mr. Ripley, "let him imagine what would happen in a very short time to Germany, France, England or to this country if all freight cars stopped running for a month, or even a week. While the war lasts there will not be enough freight cars to supply the demand, hence the necessity of making every car perform its maximum service. . . ."

Employees May Keep Their Bonds in the Company's Treasury

Arrangements to provide for the safekeeping of Liberty Loan Bonds purchased by employees of the Pennsylvania Railroad and of its lines east of Pittsburgh, have been made by the treasury department of the company, according to the announcement made last week by James F. Fahnestock, treasurer, through the general superintendents of the various grand divisions and the heads of departments in the general offices.

Special authority to perform this service has been accorded to the treasurer by the board of directors. In the capacity of custodian, he will accept for safekeeping the Liberty Bonds purchased by employees who have no such facilities. The interest on such bonds will be collected as it falls due June 15 and December 15 of each year and will be added to the payrolls for the last half of the months of June and December, respectively.

No charge of any kind will be made to employees availing themselves of this privilege. All that is required is the deposit of the bond by the execution of a request to the treasurer of the Pennsylvania Railroad, asking him to hold the bond, collect the interest and add it to the employees' payroll.

Over 53,000 of the employees of the Pennsylvania Railroad lines east of Pittsburgh subscribed to the Liberty Loan, taking a total of \$3,500,000. About 10 per cent of these made payment in full and are entitled to receive their bonds as soon as the Government makes delivery, which will probably be some time after September 1. Such employees may deposit their bonds at once if they so desire. The remainder of the bonds were purchased under the special installment plan offered by the company, which called for ten equal monthly installments of 10 per cent each beginning July 15, 1917.

2,540 Pennsylvania Employees With the Colors

Thus far, 2,540 employees of the Pennsylvania Railroad, lines east of Pittsburgh, have entered the Army and Navy of the United States as volunteers, and have been granted furloughs from the railroad service. Of this number, 75 have been appointed commissioned officers and 30 are student officers in various officers' training camps. The remainder, numbering 2,442, are enlisted men in the Army and Navy.

The commissioned officers include one colonel, one lieutenant-colonel, two majors, 21 captains, 23 first lieutenants, 22 second lieutenants, three ensigns and one pay clerk.

In addition to the employees of the Pennsylvania Railroad who have entered the military and naval service, as volunteers, many more are certain to be taken for the National Army under the draft. The exact extent by which the working force of the railroad will be further reduced, in this manner, will not be definitely known until the work of the various examining boards has been completed. However, it has been ascertained that there are in the service of the Pennsylvania Railroad lines east of Pitts-

burgh, 60,000 men, who are liable to military service under the law, and based upon the average proportion of the eligible men who will be taken in the first draft, 3,000 of these will be called.

Proposed Modifications in Locomotive Inspection Requirements

A number of proposed modifications in the rules for locomotive boiler inspection, intended to give the railroads some relief from the requirements of the present rules during the period of the war on account of the shortage of labor for shop work and inspection, were agreed upon at a conference at Washington on Wednesday between the division of locomotive boiler inspection of the Interstate Commerce Commission and the mechanical sub-committee of the Special Committee on Relations of Railway Operation to Legislation.

The modifications were proposed by the railroad committee because of the difficulty of living up to the requirements of the rules on account of the shortage of labor and materials and because of the pressure to keep all available motive power in service on account of the unprecedented volume of traffic. The members of the committee, headed by C. E. Fuller, superintendent of motive power and machinery of the Union Pacific, explained the conditions which impelled them to ask for the modifications, and asked especially for a reduction of the requirements for work on engines that could be as well taken care of when they had to be sent to the shop at some other time. Representatives of the engineers' and firemen's brotherhoods opposed any modification of the rules, and a protesting letter was received from the Railroad Department of the American Federation of Labor.

Frank McManamy, chief inspector, said he appreciated the condition and that the inspectors had been instructed to be lenient. After a discussion of the rules proposed by the roads he agreed to seek the approval of the commission for certain changes which would give relief for the period of the war, in some cases proposing modifications from the form proposed by the committee and in other cases declining to approve any change, while some of the substitute proposals gave the roads more than they had asked.

One of the modifications suggested by Mr. McManamy would permit the retention in service of locomotives with a factor of safety of $\frac{3}{4}$, to be increased to $\frac{3}{2}$ within six months after the close of the war. It was shown that numerous roads are now operating locomotives with a factor of safety less than that provided by law. Other changes provide for an extension of time for the removal of boiler tubes from three to four years, an extension for the period of the war of the time for the removal and inspection of jacket and lagging and an extension of the time for the testing of flexible staybolts with caps.

Positions Open in the Ordnance Department

The United States Civil Service Commission announces the following open competitive examinations for positions in the several ordnance establishments of the War Department, or in or under the office of the Chief of Ordnance, War Department, Washington, D. C. The salaries named are for entrance:

Mechanical engineer, artillery ammunition, \$3,000 to \$3,600 year.
Mechanical engineer, experimental work, \$2,500 to \$3,000 year.
Mechanical draftsman, \$1,000 to \$1,400 year.
Apprentice draftsman, \$480 year.
Inspector of artillery ammunition, \$1,500 to \$2,400 year.
Inspector of field artillery ammunition steel, \$1,500 to \$2,400 year.
Assistant inspector of field artillery ammunition steel, \$3.50 to \$5 day.
Inspector of ammunition packing boxes, \$3.52 day to \$1,800 year.
Inspector and assistant inspector of powder and explosives, \$1,400 to \$2,400 year.
Inspector of ordnance equipment, \$1,500 to \$2,400 year.
Assistant inspector of cloth equipment, \$80 to \$125 month.
Assistant inspector of leather, \$100 to \$125 month.
Assistant inspector of small hardware, \$80 to \$125 month.
Assistant inspector of textiles, \$80 to \$125 month.
Assistant inspector of leather equipment, \$100 to \$125 month.
Clerk qualified in business administration, \$1,200 to \$1,500 year.
Index and catalogue clerk, \$1,000 to \$1,200 year.

The examination for index and catalogue clerk is open to both men and women; the other examinations are open only to men.

The government urgently needs men for the work above indicated, and qualified persons are urged, as a patriotic duty, to apply for examination. Until further notice applications for the positions named will be received at any time by the United States Civil Service Commission, Washington, D. C. Papers

will be rated promptly. Applicants will not be required to appear at any place for examination, but will be rated principally upon the elements of education, training and experience, as shown by their applications and by corroborative evidence.

Full information concerning examinations, application blanks, etc., may be obtained by calling in person upon the secretary of the local board of civil service examiners at the post office in any city in which city delivery of mail has been established, or by communicating with the United States Civil Service Commission, Washington, D. C.

Strike of B. & M. Shopmen

The machinists, blacksmiths and boiler makers of the Boston & Maine struck, on August 31, and all the locomotive repair shops, general and division, stopped work, about 3,000 men going out. Nearly half of these men were employed at the shops at Billerica, Mass. Conferences concerning the requests of the men for higher pay have been held a number of times since last April, when an increase of about two cents an hour was granted and was made retroactive from January 1, 1917. In July the men asked for a further increase of eight cents an hour. The New Haven road has recently granted an increase and the Receiver of the Boston & Maine offered to make the pay on the B. & M. equal to that on the New Haven, but this was refused. The increase on the New Haven, three cents an hour, brought the rates up to a point a little in excess of the rates on the Boston & Maine. On Monday of this week the receiver, James H. Hustis, issued a statement in which he said:

"There should be no misunderstanding on the part of the public or of the employees as to the seriousness of the situation. The officers of the railroad, and particularly the temporary receiver, are fully conscious of what it involves. There is no thought other than that the railroad must rely largely on these men who have quit work returning to it to enable the road to give the service that is so imperatively needed at this time. It would be extremely unfortunate if there should be any bitterness injected into the controversy.

"Regardless of any question as to where the responsibility rests for the men going out, it must be remembered that as yet there has been no attempt to determine finally whether the increases in rates of pay demanded by the men are warranted by changes in conditions arising since the last wage adjustment in April, or the adoption by the New Haven Railroad in June last of a lower agreed scale for similar work.

"The sole point upon which the question of the strike has heretofore turned was whether the receiver should of his own motion, and without opportunity to consult with the United States Court under whose jurisdiction he is acting, agree to an increase of wages for certain classes of employees much higher than those paid by any other railroad in the territory; and the immediate effect of which would be to increase the cost to the railroad of such labor by about \$900,000 per year.

"To appreciate the receiver's position it must be remembered that if he should do this it is not unlikely that he would be called upon very shortly to deal with similar demands from employees (not affected by the eight-hour law) in other departments and if he granted similar increases to them, and on the same basis, the aggregate increase would run up to nearly \$5,000,000 per annum. And this in spite of the fact that the increases in wages already granted during the past twelve or fourteen months amount to upward of \$2,500,000; nor is there any guarantee that the same body of employees would not six months hence make another demand. The situation is an impossible one.

"Between the absolute necessity of the railroad retaining the men, on the one hand, and the impossibility of still further exceeding the financial capacity of the road on the other, an adjustment such as is proposed would seem to be out of the question unless there be some tribunal which can determine what is a fair compromise.

"It was the hope that the Court might be of some assistance in this direction that led the receiver to ask for a delay until September 10, when he was informed Judge Morton would return from his vacation. Efforts were made to reach Judge Morton before the strike took place but it was found that he was on a sailing trip and away from communication. We are still trying to reach him.

"It is said that if the receiver had promised that he would recommend to the Court a six cents per hour increase the men

would have deferred the strike until the Court could be consulted. It must be apparent to anyone who takes into consideration the whole situation and its possible consequences that some method of dealing with it must be found which will be more effective and more permanent than that. The situation is one that should be dealt with in such a way that the larger aspects of the case will have consideration.

"The efforts of the State Board of Arbitration and Conciliation to bring about a settlement are fully appreciated and will be availed of to the extent that it is possible to do so, but it is felt that the probable consequences will reach far beyond this State and the matter will be one of pressing interest to the Federal authorities. How far reaching are the questions here involved becomes evident if one considers that if demands similar to these were granted in all classes of labor outside of those affected by the eight-hour law, the increases in transportation rates required to compensate the railroad for the loss would be so large as to require the most careful investigation.

"In the meantime the railroad's war board has been advised of the situation and requested to inform the Secretary of Labor as to the facts. It seems unfortunate that the railroad is without the services of a large number of its employees and that the employees are losing their wages, especially in view of the fact that any wage increase that may be hereafter granted would, undoubtedly, be made retroactive."

After a conference with Justice Norton on Wednesday of this week, Mr. Hustis wrote to Mr. Fechner, chairman of the general committee of the strikers, offering to submit the controversy to arbitration, the arbitrator or arbitrators to be named by the Chairman of the Council of National Defense, the award when made to be retroactive to September 5, and the men to return to work meanwhile.

American Gear Manufacturers' Association

The meeting of the American Gear Manufacturers' Association will be held at the Edgewater Beach Hotel, Chicago, September 14 and 15. Papers on the following subjects will be presented: Advertising Don'ts, Heat Treating and Hardening of Gears, Inspection of Gearing, Spur Gearing by the Rotary or Disk Cutting Process, Spur Gears by the Shaper Method.

National Safety Congress

The National Safety Council, W. H. Cameron, Chicago, secretary, will hold its sixth annual safety congress at Hotel Astor, Broadway and 44th street, New York City, on Tuesday, Wednesday, Thursday and Friday, September 11, 12, 13 and 14. The sessions each day will be from 9:30 to 12 in the forenoon, and from 2 to 5 in the afternoon. The principal general session will be on Wednesday forenoon, with L. R. Palmer, president of the council, presiding. Addresses will be given by Hon. William D. Wilson, secretary of labor; Dr. Charles P. Steinmetz, of the General Electric Company; and Marcus A. Dow, general safety agent of the New York Central. Mr. Dow's new motion picture, "The Rule of Reason," will be exhibited.

The first meeting of the Steam Railroad Section of the Council will be held on Wednesday afternoon and will be continued Thursday morning and afternoon, and also Friday morning. The chairman of this section is Isaiah Hale (A. T. & S. F.), and the secretary is H. J. Bell (C. & N. W.). The speakers before the Section, as announced, are C. M. Anderson (N. C. & St. L.); L. E. Abbott (O. S. L.); T. H. Carrow (Penn.); Howard Elliott (L. A. & S. L.); David Moore (U. P.); C. H. Blakemore (N. & W.); J. T. Broderick (B. & O.); C. B. Floyd (N. Y. C.); S. G. Watkins (B. & M.); F. N. Loughnan (L. V.); C. H. Ratzell (St. L. S. F.); H. J. Bell (C. & N. W.); S. S. Morris (I. C.); G. L. Wright (C. St. P., M. & O.); and C. A. Cochrane (G. N.).

The meeting on Friday morning will be devoted to new subjects brought up during the preceding sessions and to reviews, if reviews are called for; and Friday afternoon will be devoted to unfinished business and to the election of officers.

Among the directors of the National Safety Council, besides Messrs. Dow, Hale and Broderick, already mentioned, are J. M. Guild (C. P.); E. F. Carry, president of Haskell & Barker; L. A. Larson, American Locomotive Company; H. D. Sharpe, Brown & Sharpe; W. B. Spaulding (St. L. S. F.); R. C. Richards (C. & N. W.); E. C. Spring, Lehigh Valley Transit Co.;

and W. C. Wilson, formerly on the Delaware, Lackawanna & Western.

In connection with this congress there will be an elaborate "safety exposition" in the Grand Central Palace, 40th street and Lexington avenue, open each day, including Saturday, from 3 p. m. to 10.30 p. m. The director of exhibits is M. A. Dow (N. Y. C.), third vice-president of the Council, who also is chairman of the committee of arrangements for the congress.

War Convention of American Business Men

The Chamber of Commerce of the United States has called a War Convention of American Business Men, to be held at Atlantic City, September 18 to 21, inclusive.

As briefly noted in the *Railway Age Gazette* of August 24, the general subjects discussed will be:

- (1) The duty that business owes the Government in war;
- (2) How may the business of the country render greater service in winning the war? Under this subject will also be discussed the question: How shall greater efficiency of land and water transportation be developed?
- (3) Ways and means by which business may most readily adjust itself to the conditions produced by the war;
- (4) For what readjustments after the war must business prepare?

In calling the meeting the president of the Chamber of Commerce has stated:

"It is the patriotic duty of every live business man who can possibly arrange to do so to attend this convention, not only to show emphatically where the business men of the United States stand in the present crisis, but also that each may gain from such a meeting all possible knowledge as to how he can plan more intelligently to be of greater service in the common cause."

The Chamber of Commerce in its War Bulletin No. 17, adds that:

"This convention will give business men the opportunity to voice their support of the government in this time of national trial. It will give them the opportunity of expressing to the government what the experience of business men has been in problems similar to those which the government is now facing. They can learn from government representatives who will be at the meeting what the government expects of business. But above all, the meeting will bring business men in contact with the problems of this great industrial war, and give them the opportunity of thinking about these problems and of reaching conclusions."

Exhibitors at the Roadmasters' Convention

The convention of the Roadmasters' and Maintenance of Way Association will be held at the Auditorium Hotel, Chicago, September 18 to 20, inclusive. The program for this meeting will be found elsewhere in this issue. From the interest expressed and the progress made in the preparation of committee reports and papers the meeting promises to be one of the most valuable ever conducted by this organization.

Equally promising indications are evident relative to the exhibit of the Track Supply Association, although the letters asking for reservations of space were not sent out until July 26. Forty-seven firms have already arranged to present exhibits and only a few spaces remain to be allotted. Among the firms which have already arranged to present exhibits are the following:

Ajax Forge Company, Chicago.
Alexander Milburn & Co., Baltimore, Md.
American Steel & Wire Co., Chicago.
American Valve & Meter Co., Cincinnati, Ohio.
American Hoist & Derrick Co., St. Paul, Minn.
Anti-Creep Corporation, New York.
Barrett Co., New York.
Bethlehem Steel Co., South Bethlehem, Pa.
Carbic Mfg. Co., Duluth, Minn.
Carnegie Steel Co., Pittsburgh, Pa.
Chicago Railway Equipment Co., Chicago.
Chicago Malleable Castings Co., Chicago.
Cleveland Frog & Crossing Co., Cleveland, Ohio.
Crerar, Adams & Co., Chicago.
Duff Mfg. Co., Pittsburgh, Pa.
Fairbanks, Morse & Co., Chicago.
Fairmont Gas Engine & Railway Motor Car Co., Fairmont, Minn.
Hauck Manufacturing Company, New York.
Hayes Track Appliance Co., Richmond, Ind.
R. W. Hunt & Co., Chicago.
Ingersoll Rand Co., New York.

Indianapolis Brush & Broom Co., Indianapolis, Ind.

Lackawanna Steel Co., Buffalo, N. Y.

Madden Co., Chicago.

Mudge & Co., Chicago.

National Lock Washer Co., Newark, N. J.

National Malleable Castings Co., Cleveland, Ohio.

Pocket List of Railroad Officials, New York.

Positive Rail Anchor Co., Marion, Ind.

P. & M. Co., Chicago.

Q. & C. Co., New York.

Rail Joint Co., New York.

Railway Equipment & Publication Co., New York.

Railroad Supply Co., Chicago.

Ramapo Iron Works, Hillburn, N. Y.

Reading Specialties Co., Reading, Pa.

Henry Roos Foundry Co.

Sellers Mfg. Co., Chicago.

Simmons-Boardman Publishing Co., New York.

Simple Gas Engine Co.

Southern Railway Supply & Equipment Co., St. Louis, Mo.

Templeton-Kenly Co., Chicago.

Union Switch & Signal Co., Swissvale, Pa.

Verona Tool Works, Pittsburgh, Pa.

Walls Frogless Switch & Mfg. Co., Kansas City, Mo.

Wm. Wharton, Jr., & Co., Easton, Pa.

Wyoming Shovel Works, Wyoming, Pa.

MEETINGS AND CONVENTIONS

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

AIR BRAKE ASSOCIATION.—F. M. Nellis, Room 3014, 165 Broadway, New York City.
AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontious, 455 Grand Central Station, Chicago.
AMERICAN ASSOCIATION OF DYING AR SUPERINTENDENTS.—H. C. Boardman, D. L. & W., Hoboken, N. J. Next convention, October, 1917, San Francisco, Cal.
AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, Illinois Central, Chicago, Ill.
AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Next meeting, October 16-17, St. Louis.
AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Hartman, Room 101, Union Station, St. Louis, Mo.
AMERICAN ELECTRIC RAILWAY ASSOCIATION.—E. B. Burritt, 8 W. 40th St., New York. Convention for 1917 postponed.
AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOCIATION.—Fred C. J. Dell, 165 Broadway, New York.
AMERICAN RAILROAD MASTER TINNERS', COPPERSMITHS' AND PIPEFITTERS' ASSOCIATION.—W. E. Jones, C. & N. W., 3814 Fulton St., Chicago. Convention for 1917 postponed.
AMERICAN RAILWAY ASSOCIATION.—J. E. Fairbanks, general secretary, 75 Church St., New York.
AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 16-18, 1917, Chicago.
AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago.
AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, 1112 Karpen Bldg., Chicago.
AMERICAN RAILWAY FOREMEN'S ASSOCIATION.—Owen D. Kinsey, Illinois Central, Chicago.
AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.
AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.
AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 59th St., New York.
AMERICAN WORK PRESERVERS' ASSOCIATION.—F. J. Angier, Supl. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January, 1918, Chicago.
ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—E. R. Woodson, Rooms 1116-8 Woodward Bldg., Washington, D. C. Next meeting, September 26, Congress Hotel, Chicago.
ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Semi-annual meeting with Master Car Builders' Association.
ASSOCIATION OF RAILWAY CLAIM AGENTS.—Willis H. Failing, Terminal Station, Central of New Jersey, Jersey City, N. J.
ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreuccetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago. Semi-annual and annual convention postponed indefinitely.
ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—W. L. Connelly, Superintendent of Telegraph, Indiana Harbor Belt, Gibson, Ind. Next annual meeting to have been held September 18, 1917, Washington, D. C., indefinitely postponed.
ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 75 Church St., New York.
BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—Tom Lehon, The Lehon Company, Meetings with American Railway Bridge and Building Association.
CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June and August, Windsor Hotel, Montreal, Que.
CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.
CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Laylor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.
CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.
CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—W. R. McMunn, New York Central, Albany, N. Y. Next convention, September, 1917, St. Louis.
ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 568 Union Arcade Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

FREIGHT CLAIM ASSOCIATION. Warren P. Taylor, Traffic Manager, R. F. & P., Richmond, Va.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, C. H. & D., Lima, Ohio.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—J. G. Crawford, C. B. & O. R. R., 702 E. 51st St., Chicago. Next convention, May, 1918, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1126 W. Broadway, Winona, Minn. Annual meeting, to have been held September 4-7, 1917, Hotel Sherman, Chicago, indefinitely postponed.

INVESTMENT BANKERS' ASSOCIATION OF AMERICA. Frederick R. Fenton, 11 W. Madison St., Chicago. Annual convention, October 1-3, 1917, Baltimore, Md.

MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 16-18, 1917, Cleveland, Ohio.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—A. P. Darte, B. & M., Reading, Mass. Next annual meeting, September 11, 1917, Chicago.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, 1112 Karpen Bldg., Chicago.

NATIONAL ASSOCIATION OF RAILWAY COMMISSIONERS.—Jas. B. Walker, 120 Broadway, New York City. Next annual convention, October 16, 1917, Washington, D. C.

NATIONAL RAILWAY APPLIANCE ASSOCIATION.—C. W. Kelly, 349 Peoples Gas Bldg., Chicago.

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

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Geo. A. J. Hochgrebe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PACIFIC RAILWAY CLUB.—W. J. Wollner, Assistant to Chief Engineer, Northwestern Pacific R. R., San Francisco, Cal.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria, Ill.

RAILWAY BUSINESS ASSOCIATION. Frank W. Naxon, 30 Church St., New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial Annex Hotel, Pittsburgh.

RAILWAY DEVELOPMENT ASSOCIATION.—D. C. Welby, Commissioner of Agriculture, St. Louis, Mo. & So., 1047 Railway Exchange Bldg., St. Louis. Next annual convention, May, 1918, Houston, Tex.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—I. Scribner, 1063 Monandnock Block, Chicago. Meetings with Association of Railway Electrical Engineers.

RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, Office of the President's Assistant, Seaboard Air Line, Norfolk, Va. Next meeting, October 24, 1917, St. Louis, Mo.

RAILWAY REAL ESTATE ASSOCIATION.—R. H. Morrison, Assistant Engineer, C. & O., Richmond, Va. Next convention, October, 1917, Duluth, Minn.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next annual convention, September 18-19, 1917, Hotel Traymore, Atlantic City, N. J.

RAILWAY STOKKERS' ASSOCIATION.—J. P. Murphy, N. Y. C. R. R., Box C, Collinwood, Ohio.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 2136 Oliver Bldg., Pittsburgh, Pa. Meetings with Master Car Builders' and Master Mechanics' Association.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 50 Church St., New York. Meetings with Association of Railway Telegraph and Telephone Engineers.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. I. McAndrews, C. & N. W., St. Louis, Ill. Next annual convention, September 18-21, 1917, Hotel Auditorium, Chicago.

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

SALT LAKE TRANSPORTATION CLUB.—R. E. Rowland, David Keith Bldg., Salt Lake City, Utah. Regular meetings, 1st Saturday of each month, Salt Lake City.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—L. W. Cox, N. & W., Philadelphia, Pa. Next annual convention, October 16-18, St. Louis, Mo.

SOUTHERN ASSOCIATION OF RAILWAY SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. R. R., Atlanta, Ga.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. I. Merrill, Grant Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 n. m., Piedmont Hotel, Atlanta, Ga.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Rampart Iron Works, Tillburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAIN DISPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7122 Stewart Ave., Chicago. Next annual convention, June 18, 1918, Grand Rapids, Mich.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio. Next convention, to have been held September, 1917, Chicago, indefinitely postponed.

WESTERN ASSOCIATION OF SHORT LINE RAILROADS.—Clarence M. Oddie, Mills Bldg., San Francisco.

WESTERN CANADIAN RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

WESTERN SOCIETY OF ENGINEERS.—Edgar S. Nethercut, Acting Secretary, 1735 Monandnock Block, Chicago, Ill. Regular meeting, first Monday in month, except January, July and August. Extra meetings generally on other Monday evenings except in July and August.

Traffic News

The Railroads' War Board has notified the war council of the Red Cross that Red Cross shipments to the seaboard for transportation abroad or elsewhere, will be exempted from any embargoes and will practically be given the right of way over everything except government freight.

The railroads have withdrawn their application to the State Public Utilities Commission of Illinois for a reduction of free time in the loading and unloading of open-top cars from 48 hours to 24 hours, and for the elimination of free time in connection with the reconsignment of open-top cars.

The Public Utilities Commission of Ohio recently announced that tariffs filed by the railroads of the state providing for a horizontal increase in coal and coke rates of 15 cents a ton would become effective on September 1, without affirmative action by the commission. The tariffs were suspended twice pending hearings before the commission.

Better housing conditions for potatoes will be the topic to be discussed in the next campaign of the Lehigh Valley Railroad's agricultural department. The railroad sent a "Potato Special" through its territory last spring, demonstrating modern methods of planting and spraying, and now the most improved methods for building pits and cold storage houses installed in a car which will be used for demonstration purposes. There will be lectures on the new Federal standards for grading potatoes and the new arrangements by which farmers can borrow money on their stored potatoes. To accomplish maximum loading of cars and at the same time prevent a great spoilage through congestion at the terminal markets, Mr. Stevens, the road's agriculturist, is urging better storage facilities on the farms. Mr. Hoover has approved the plan. An itinerary for the car is now being arranged.

E. P. DeHoyos, general agent of the Mexican Railway, 233 Broadway, New York City, advises that sleeping cars are now running regularly between Mexico City and Vera Cruz, and he declares untrue the recent report that the sleeping cars of this road have been scattered all over Mexico by the military authorities. The through night trains, No. 5 and No. 6, are not now in operation, because of scarcity of locomotives and the sleeping cars are run on trains No. 1 and No. 2. These trains run through in 14 hours 30 minutes. Mr. DeHoyos is general agent also for the Constitutionalist Railways, operating the National Railways (as well as for the Tehuantepec National Railway); and he says that arrangements have been completed and shortly will be put in effect for the resumption of regular Pullman sleeping car service between San Antonio, Texas, and the City of Mexico.

The passenger department of the Canadian Pacific announces that bona fide tourists who are citizens of the United States or allied or neutral countries do not require passports to enter or permits to leave Canada and are assured courteous treatment and a hearty welcome. Persons born in an enemy country, however, who claim to have been naturalized in the United States, should carry naturalization papers and those of evident enemy origin who claim to have been born in the United States or in some other allied or neutral country should carry birth certificates or some other evidence of their birthplace. To facilitate departure from Canada, males between 18 and 45 years of age entering Canada for temporary purposes may secure, on application to the Canadian immigration officer where they enter, a card showing that they are not residents of Canada. Women and children do not require any identification card.

Telegraphic Reports of All Accidents

The Public Utilities Commissioners of Colorado, George T. Bradley, M. H. Aylesworth and A. P. Anderson, have issued an order concerning notification of accidents, as follows:

"It is ordered, that when any wreck, or any collision of trains, or any collision of trains with vehicles or pedestrians, resulting in loss of life or injury to persons, occurs upon any line, . . . either steam or electric, the superior officer, agent or employee

of the carrier on the ground at the time of the accident shall immediately notify the Public Utilities Commission, Denver, by telegram, the details of such accident, stating the immediate location, the nature and cause of the accident, and the number of persons killed or injured. . . . Disobedience . . . punishable by fine of \$1,000, or by imprisonment for one year, or both. . . ."

Production of Bituminous Coal

According to the weekly report on the production of bituminous coal and the causes of loss of working time, compiled by the Geological Survey, Department of the Interior, the ratio of tonnage produced to full-time output continued to decline during the week ended August 11. Mines representing more than one-third of the output of the country produced 71.8 per cent of their combined full-time capacity as limited by the present labor force. The index not only fell below the level of the preceding week (73.0), but reached the lowest point attained since June 1, when the system of weekly reports was begun. Iowa, Illinois, Ohio, Kansas and Missouri declined; Alabama, southwestern Virginia and western Pennsylvania held their own, while eastern Kentucky and Tennessee recovered to some extent from the depression of the week before.

Orders Heavier Loading of Cotton

The Commission on Car Service has issued instructions prohibiting the shipping of cotton in quantities less than 65 bales in a car and requiring as many more to be loaded as the size of the car furnished will permit. Notice to this effect has just been sent to buyers of cotton, together with a request that they place orders for their requirements on a basis of not less than 65 bales or multiples thereof. In the Southwest and Mississippi delta districts, the average car will load 65 bales, and in the Southeast the average car will load 75 bales. Consequently buyers are asked to order in multiples of 65 from the Southwest and in multiples of 75 from the Southeast districts.

"The New England territory will be taxed to the maximum capacity of facilities this fall," says the notice, "and the acceptance of freight by the railroads serving the territory north of the Ohio and Potomac rivers will have to be carefully regulated."

Clifford Thorne Organizes Shippers' Association

At a meeting in Chicago, August 31, of members of the National Shippers' Conference, which was formed last spring to oppose the proposed 15 per cent increase in freight rates, a permanent organization of shippers and shippers' associations was effected. The new association will be known as the National Federation of Shippers, and proposes to protect the interests of its members in rate cases before the Interstate Commerce Commission and state commissions. A resolution was passed authorizing the appointment of a committee to present a protest to the Interstate Commerce Commission against the increases in commodity rates on grain, livestock, oil and lumber proposed by the carriers in Official Classification territory. Among the reasons given for the opposition of the association to these advances is that they will increase the cost of living during the duration of the war and increase the cost of the war to the Government. If the railroads persist in asking increased rates it is the purpose of the federation to recommend that the Act to Regulate Commerce be amended so as to provide that no rates shall be advanced except after all shippers concerned have been notified and have been given opportunity to secure a full hearing.

Among those who took a prominent part in the meeting were Clifford Thorne, formerly chairman of the Railroad Commission of Iowa; Luther M. Walter, a Chicago attorney specializing in interstate commerce cases; and Judge S. H. Cowan, of the Texas Industrial Traffic League and other Texas shipping organizations. Among the associations who had representatives at the meeting were the National Live Stock Shippers' Protective League, the National Petroleum Association, the National Council of Farmers' Co-operative Grain Dealers, the National Lumber Manufacturers' Association, the Western Oil Jobbers' Association, the Western Petroleum Refineries Association, the Natural Ice Association of America and the National Lime Manufacturers' Association.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The Interstate Commerce Commission has made public a tentative report by Attorney-Examiner G. N. Brown, recommending a finding that carriers have not justified their proposal to reduce free time on export freight from 10 to 5 days at gulf ports and from 15 to 5 days at North Atlantic ports. The report recommends that the carriers be allowed to make effective their proposed reduction from 10 to 5 days on bunker coal at New Orleans, Mobile and Pensacola. Attorney-Examiner La Rue, in a tentative report on the New York harbor storage case, recommends a finding that the carriers have shown that it will be reasonable for them to reduce from 5 days to 2 days the free time allowed for holding freight at railroad terminals consigned to the New York lighterage district. He also recommends that the proposed increased storage charges on both export and domestic freight be allowed to become effective. Arguments on these reports will be heard by the commission on October 4.

Southern Pacific May Retain Interest in Direct Navigation Company

Opinion by Commissioner Meyer:

The commission finds that the Southern Pacific and Morgan's Louisiana & Texas may continue to operate or have an interest in the Direct Navigation Company, owning three tugs, six barges, wharves at Houston, etc., and operating on Buffalo Bayou between Houston and Galveston. (46 I. C. C., 378.)

Rates to Iowa Points

Board of Railroad Commissioners of the State of Iowa v. Ann Arbor et al. Opinion by Commissioner Harlan:

This proceeding in a sense is supplementary to the Mississippi River Case, 28 I. C. C., 47, and 29 I. C. C., 530; it also is closely related to the Interior Iowa Cities Case, 28 I. C. C., 64, and 29 I. C. C., 536, which was reopened on petitions for rehearing, and is now pending before the commission. In the case first cited the class-rate adjustment between the territory east of the Indiana-Illinois state line and the cities in the state of Iowa on the Mississippi river was brought in issue. That same adjustment, to the extent that it affected the construction of through rates to and from the interior Iowa cities, also was dealt with in the case last cited. In respect of traffic to and from the central freight association territory the commission is asked, in the complaint here before it, to place the Iowa cities, located on the Mississippi river, upon a rate parity with St. Louis, Mo.

The commission holds that:

From points in central freight association territory, west of the Pittsburgh-Buffalo line and east of the Indiana-Illinois state line, there should be no difference in the rates to the upper group cities in Iowa on the Mississippi river and to St. Louis, when the distances to the upper group cities are equal to or less than the distances to St. Louis; but for each 25 miles or fraction thereof that the distances to the upper group cities exceed the distances to St. Louis, rates to the upper group cities may exceed the rates to St. Louis by one cent on the first two classes and one-half cent on the remaining four classes.

From Pittsburgh, Buffalo and points taking the same rates, to cities on the west bank of the Mississippi river from and including Dubuque on the north to and including St. Louis on the south, the class rates shall not exceed 64½ per cent of the rates contemporaneously maintained between New York City and St. Louis.

The basis herein found proper will apply both eastbound and westbound, and the carriers will be expected to adjust their commodity rates in conformity therewith. (46 I. C. C., 20.)

Interior Iowa Cases. Opinion by Commissioner Harlan:

The Mississippi-Missouri river proportional class scale, whatever its measure may be, shall for the future be equitably prorated across the state of Iowa in constructing reasonable maxi-

mum proportional class rates between the west bank of the Mississippi river and interior Iowa cities on traffic originating at or destined to points in official classification territory east of the Indiana-Illinois state line.

Upon that basis reasonable maximum class rates are herein prescribed, and it is expected that the carriers will adjust their commodity rates in conformity therewith.

This is the second supplemental report in this case. "In the original report," says the opinion, "we announced that the carriers would be expected to propose a system of single proportional rates, applicable west of the Mississippi river on through traffic moving in both directions, that would bear a reasonable relation to the Mississippi-Missouri river proportional scale of 55 cents; and although the proportional rates subsequently established had our approval, it becomes apparent that the interior Iowa cities were not given the relief which this broader record shows they are entitled to have. It is also clear that the rate changes since made have unquestionably enlarged the disadvantages of which the interior Iowa cities complained in the original proceeding." (46 I. C. C., 39.)

Board of Railroad Commissioners of the State of Iowa v. Atchison, Topeka & Santa Fe. Opinion by Commissioner McChord:

Ocean-and-rail and rail-lake-and-rail class rates from upper Mississippi river cities, Dubuque, Iowa, to Keokuk, Iowa, inclusive, to points in trunk line territory found to be unduly discriminatory and prejudicial when compared with corresponding rates from the lower Mississippi river cities, Quincy, Ill., to St. Louis, Mo., inclusive, to the same points.

STATE COMMISSIONS

The New York State Public Service Commission, First district, as a result of a shutdown in the service of the Interborough subway for several hours on the afternoon of Saturday, August 25, delaying many thousands of passengers, has issued an order directing the Interborough Rapid Transit Company to maintain a coal supply in the bunkers of its subway power station sufficient to operate the subway for several days. The shutdown was due to failure of the coal supply. The company is required to report to the commission whenever the reserve supply of coal falls below 2,500 tons. The commission has also issued orders to its own inspectors to see that the order is lived up to, and is also making observations of other public utility companies, with the view of seeing that they have a sufficient coal supply to provide a continuous and regular service.

PERSONNEL OF COMMISSIONS

Edgar J. Watkins, attorney-examiner of the Interstate Commerce Commission, has resigned to engage in private practice.

COURT NEWS

Permits to Ship Liquor

The Supreme Court of the State of Washington holds that since the Webb-Kenyon Law divests interstate shipments of liquor of their character as interstate shipments, the statute of 1915, requiring a permit, applies to a shipment originating in Kentucky consigned to Washington, and on failure to secure a permit the liquors are liable to seizure.—*State v. Great Northern* (Wash.), 165 Pac., 1073. Decided June 22, 1917.

Damages for Delay of Fire Engine at Crossing—Nonsuit

In an action against a railroad for damages for injury in consequence of its obstruction of a grade crossing by its trains so as to delay a fire engine in reaching the plaintiff's burning building, it did not appear that those in charge of the train knew or ought to have known of the fire when they were using or about to use the crossing, or that until the gates were raised, it was reasonably practicable for the railroad to have cleared the crossing and enabled the engine sooner to reach the fire. The Pennsylvania Supreme Court held that a compulsory nonsuit was properly ordered.—*Kirstein v. Philadelphia & Reading* (Pa.), 101 Atl., 338. Decided March 19, 1917.

Equipment and Supplies

LOCOMOTIVES

SOUTHERN PACIFIC.—According to an announcement by Wm. Sproule, president of the Southern Pacific, 65 new locomotives, costing over \$2,500,000 are on order for the Pacific System Lines. Ten of the locomotives are to be built at the company's shops. This latest order brings the total expenditures for new equipment by the Southern Pacific and the Pacific Fruit Express, of which it is half owner, to \$24,500,000.

"This great building program," said Mr. Sproule, "is evidence of what the Southern Pacific is doing to make its facilities equal to the unusual demand for equipment occasioned by the war situation and general business expansion. The total number of freight cars we have had built this year or are having built, reaches almost 10,000, and comprises 300 box cars, 1,000 flat cars, 900 stock cars, 600 oil cars, 1,000 automobile cars, 400 gondolas, 40 narrow-gage flat cars, 50 cabooses, and 2,700 modern refrigerator cars for the Pacific Fruit Express. One thousand of the P. F. E. refrigerators, as well as 10 locomotives are to be built on the coast. There have already been delivered to us under this program 3,450 freight cars, and five mail and baggage cars. The refrigerator cars will begin to arrive about September 1. We have now building in the East 300 oil tank cars, 11 locomotives, and 20 baggage and mail cars. We are about to start on the construction of the 3,240 freight cars announced some time ago, and this work will be done at home. It is very difficult during these times to make any predictions as to when equipment can be delivered, because the orders of our government and the government of the allies for cars and locomotives are being given preference. We are making this expenditure responsive to the needs of the present emergency, although the prices of labor and material are the highest in the history of the world."

FREIGHT CARS

THE SEABOARD AIR LINE is in the market for 500 flat cars.

THE SOUTHERN RAILWAY is asking prices on about 400 freight cars.

THE VIRGINIAN RAILWAY is reported as about to place orders for 1,000 55-ton steel hopper cars.

RUSSIAN GOVERNMENT.—The Canadian Car & Foundry Company is negotiating with the Russian authorities for a large portion of the big Russian order which will shortly be distributed to the Canadian companies, totalling, as was noted in the *Railway Age Gazette* of August 10, 10,000 four-wheel cars.

THE UNITED STATES GOVERNMENT has placed additional orders for 500 small push cars with the Pressed Steel Car Company and 500 convertible ballast cars with the American Car and Foundry Company. The Government authorities are also reported as about to place additional orders for cars. It is understood that orders for 10,000 or more cars are in contemplation.

SIGNALING

THE TEXAS & NEW ORLEANS has ordered from the General Railway Signal Company a 4-lever interlocking, to be installed at Connell, Tex.

THE LEHIGH VALLEY has ordered from the General Railway Signal Company a 6-lever interlocking for installation at Bridge 386.

THE YAZOO & MISSISSIPPI VALLEY is to install an 8-lever interlocking at New Basin Canal, New Orleans. The material is from the General Railway Signal Company.

THE ALABAMA GREAT SOUTHERN is to install automatic block signals between Russell, Miss., and Toomsaba, 24 Model 2A, one arm, 10 volt, top-of-mast signals. The material will be furnished by the General Railway Signal Company.

Supply Trade News

L. L. Holmes, formerly purchasing agent of the Cincinnati, Indianapolis & Western at Indianapolis, Ind., has been appointed railroad representative of the Barrett Company, New York, with headquarters at Boston, Mass.

The Acar Manufacturing Company, 30 Church street, New York, has opened a Chicago office, in charge of Leland T. Johnson at room 649, McCormick building. Mr. Johnson will handle matters for this company in the western territory.

E. F. Carry, president of the Haskell & Barker Car Company, has been appointed as a representative of the Emergency Fleet Corporation, United States Shipping Board, on a labor adjustment board to adjust labor and wage disputes in connection with the building of ships for the Government.

A. E. Heffelfinger, who for more than two years past has been chief draftsman of the National Steel Car Company, Ltd., Hamilton, Ont., has recently been appointed chief engineer of that company. Mr. Heffelfinger was born April 10, 1881, at Reading, Pa. Following his graduation from the Williamson Free School of Mechanical Trades in 1900 he entered railroad service as a special apprentice in the car shops of the Philadelphia & Reading, at Reading, Pa. On the completion of his apprenticeship he served at different times as draftsman, designer, checker, estimator, computer and principal assistant engineer with the Harlan & Hollingsworth Corporation, the Pressed Steel Car Company and the American Car & Foundry Company. He was with the latter company for over eight years, during which time his headquarters were in its New York office. Mr. Heffelfinger has had a wide experience in handling engineering problems in connection with the manufacture of railroad equipment for export, and he served as engineer to the Cuban representative of the American Car & Foundry Company in 1912 and 1913.



A. E. Heffelfinger

W. K. Palmer, president of the W. K. Palmer Company, Engineers, Kansas City, Mo., has received a commission as major in the engineers' corps of the United States Army. In consequence his practice and the business of the W. K. Palmer Company will be discontinued after September 1, for the period of the war.

The McCarthy Drill & Tool Corporation of Toledo, Ohio, with executive offices at 30 Church street, New York, has purchased the Toledo Drill & Tool Company of Toledo, which has just moved into a new and enlarged fireproof two-story structure, where it has arranged to turn out large quantities of high-speed drills, in addition to a full line of cutters and reamers.

The Titanium Alloy Manufacturing Company announces that the constantly increasing demand for superior bronze and brass castings has compelled it to enlarge its bronze department and make a distinct unit of it under the name of the Titanium Bronze Company, Inc. The company's works are at Niagara Falls, N. Y.; its sales offices at Buffalo, and its general offices at 165 Broadway, New York.

Frank W. Davis, manager of railroad sales of the Lake Erie Iron Company, Cleveland, Ohio, died very suddenly of heart disease at the Royal Muskoka hotel, Muskoka, Canada, August 8. Mr. Davis was born in Cleveland, January 1, 1857. He received his education in the Cleveland public schools and

Oberlin, and commenced his business career with Bingham & Phelps, who at that time conducted a retail hardware business on Ontario street. He afterward engaged as a commercial traveler, and while on one of his trips he became acquainted with C. W. Scofield, secretary and treasurer of the Lake Erie Iron Company, who eventually employed him as a salesman for that company. He remained in the service of the Lake Erie Iron Company for 27 years.

F. P. Huntley

F. P. Huntley, whose resignation from his position as vice-president and general manager of the Gould Coupler Company and vice-president of the Gould Storage Battery Company has recently been announced in these columns, leaves after having completed 28 years of continuous service with these interests. Mr. Huntley began his business career in 1888 when he became a stenographer to the superintendent of motive power of the New York, Lake Erie & Western (now part of the Erie) but very shortly afterwards he left to become associated with the Gould interests as a bookkeeper and stenographer in the Gould Steam Forge, which completed an axle plant at Buffalo, N. Y., early in 1889.



F. P. Huntley

It is interesting to know that 21 years later (in 1909) Mr. Huntley introduced the first quick-acting hydraulic press used in this country in this same forge plant, then located at Depew, N. Y.

The Gould Coupler Company started in business in 1889, but its manufacturing was done for some years under contract by outside plants. In 1892 the main office of the company was moved to New York City, and the malleable iron plant was built at Depew, N. Y. Mr. Huntley was made secretary and director of the Gould Coupler Company in 1892, this company having previously absorbed the Gould Steam Forge. Seven years later, in 1900, when the Gould Storage Battery Company was formed, he was elected also vice-president and a director of that company, holding that position continuously thereafter.

In 1903 the plant for the manufacture of larger steel castings was erected at Depew, in which bolsters, couplers, side frames, and miscellaneous railroad castings were made. Both the erection of this plant and its operation afterwards was under the direct charge of Mr. Huntley.

In 1905 Mr. Huntley resigned as secretary of the Coupler Company and was elected vice-president, general manager, and a director which position he now relinquishes. Mr. Huntley, still a young man, has had the opportunity of seeing and studying from their inception, the most of the modern devices now used in railroad service in this country, and to a certain extent abroad. It is quite probable he will continue to be identified with the railway supply industry, although he has as yet announced no plans.

TRADE PUBLICATIONS

THOR DRILLS.—The Independent Pneumatic Tool Company, Chicago, Ill., has issued a folder illustrating the various types of piston air drills, pneumatic hammers and electric drills manufactured by that company. A table is also included giving the detailed characteristics and suitable service for each type of equipment.

NO TRANSPORTATION FOR BRITISH SOLDIERS.—The parliamentary secretary to the British war office stated recently that it was considered that soldiers stationed in Great Britain should not, as a rule, be granted leave, other than draft leave, if it involves traveling by train.

Railway Construction

APACHE RAILWAY COMPANY.—This company is completing surveys for a line from Hollbrook, Ariz., to White River, by way of Snowflake, Shumway, Lakeside & Pinetop, a total distance of about 71 miles. The work involves about 13,000 cu. yd. of grading per mile. The road will have a maximum grade of 1½ per cent and a curvature of 6 deg. The line will top the White Mountain timber belt and the Apache Indian Reservation. Grading work will be started in about 30 days, and it is expected that the road will be opened for operation in about a year.

ILLINOIS CENTRAL.—This company has called for bids for the construction of a four-track, concrete bridge at Kankakee, Ill. The structure will be approximately 570 ft. long and will have six arches, five of which will be 90 ft. long and the other one 60 ft.

This company has also awarded a contract to T. S. Leake & Co., Chicago, for the enlarging of storehouses and roundhouse stalls at Clinton, Ky. The improvements involve the shifting of some tracks and a total expenditure of about \$100,000.

INDIANA HARBOR BELT.—This company has completed plans for the rebuilding of the I.C.I. transfer station at Gibson, Ind., which was recently destroyed by fire. The cost of the building will be approximately \$75,000, and the work will be completed about October 1.

NEW YORK CENTRAL.—A contract has been given to the Eastern Concrete Steel Company, Buffalo, N. Y., for the construction of a building two stories high, 60 ft. by 500 ft., to be used by the American Express Company as a transfer station, for the consolidation of car shipments and for local service, with offices on the second floor. The building is located at Curtis street, Buffalo, and will be of reinforced concrete construction, including platforms and canopies.

NORTHERN PACIFIC.—This company has awarded a contract to the E. J. Rounds Construction Company, Seattle, Wash., for the construction of a depot at American Lake. The building will be 300 ft. long, 30 ft. wide and one story high, with concrete foundation and frame construction, and will cost approximately \$12,000. The road has also completed a reclamation plant at South Tacoma at a cost of about \$60,000. The plant includes two scrap platforms, each 50 x 600 ft., and three working sheds, 50 ft. by 100 ft. each. The sheds are equipped with rolls for smaller sizes of round and square bars and machines for the manufacture of bolts, etc., from scrap material.

PACIFIC ELECTRIC.—This company has completed plans for the construction of 12 one and two story buildings of steel and concrete construction, at Torrance, Cal. The total cost of the project will approximate \$1,200,000.

TEXAS ELECTRIC.—This company is constructing two single-track extensions from Waco, Tex., to Camp McArthur, about five miles. The cost of the work will be approximately \$60,000, and the company expects to have the line completed by September 15.

UNION PACIFIC.—This company is building approximately 13 miles of side tracks and running tracks to reach various points on the military reservation at Ft. Riley, Kan. Other improvements including considerable yardage at Junction City have been authorized. Details of these improvements will be announced later.

WISCONSIN INTERURBAN.—This company has awarded a contract to J. T. Adams, Columbus, Ohio, for the construction of a line from Madison, Wis., to Janesville, a distance of 40 miles. The road will have a maximum grade of 1½ per cent and maximum curvature of 6 deg. The work will involve about 15,000 cu. yd. of grading per mile, and the construction of several pile bridges, sub-stations, car barns, freight and passenger stations. In addition to the Janesville branch the company is planning the construction of a line from Madison to Fond du Lac, and another from Madison to Prairie Du Sac and Portage. The aggregate mileage of the three lines will be about 207 miles.

Railway Financial News

MISSOURI, KANSAS & TEXAS.—An application for the appointment of an additional receiver to act with Charles E. Schaff, now the sole receiver, was filed August 30 in the U. S. District Court at St. Louis by Speyer & Co., of New York. A hearing on the petition will be held before Judge William C. Hook in New York City on September 7. Speyer & Co. filed the petition as holders of \$7,000,000 of two-year notes and a portion of the general mortgage bonds and of part of the first refunding bonds. The fixed charges and sinking fund charges now aggregate \$7,000,000 a year. It is stated that the reorganization plan of Hallgarten & Co. and J. & W. Seligman & Co., New York bankers, cut the fixed charges to \$3,800,000, while Speyer & Co. maintained that the fixed charges could be safely fixed at about \$4,500,000, in which case they would still amount to only 62½ per cent of the average net earnings for the years from 1911 to 1915. The bankers further state that the fixed charges of \$4,500,000 are justified by the past and present earnings capacity of the system, especially in view of the new money which is to be raised through the reorganization. Differences of opinion, the petition states, have arisen between the present receiver and the holders of the two-year notes and general mortgage bonds as to a number of questions of policy, such as prompt payment of the interest on \$40,000,000 of 4 per cent first mortgage and other underlying bonds. In view of these differences and of the fact that the interests of the junior security holders differ from the interests of prior lien holders, the petitioners claim that the junior security holders are entitled to a direct representation in the management of the road, "especially in view of the fact that the receiver has shown himself to be a partisan of the proposed plan, which favors the holders of prior liens." They also state that the receiver in a discussion upon the merits of a plan of reorganization should not aline himself with one set of security holders against another.

NEW YORK CENTRAL.—Application has been made to the New York Public Service Commission, Second district, for permission to issue \$10,000,000 Series A of refunding and improvement 4½ per cent bonds; and to issue and sell \$15,000,000 of its promissory notes, bearing interest at a rate not to exceed 5 per cent per annum. As security for the payment of these notes the company proposes to pledge the \$10,000,000 of Series A bonds, and also \$10,000,000 additional bonds, the issue of which was authorized by the commission on April 26, 1917. The proceeds of the sale of the notes are to be used for the following purposes: \$5,500,000 for additions and betterments, and \$9,500,000 for the discharge of outstanding obligations.

NEW YORK, NEW HAVEN & HARTFORD.—In answer to the \$165,000,000 restitution suit instituted in the Federal District Court at New York on August 30, 1916, by five stockholders, J. Pierpont Morgan, Herbert L. Satterlee, William P. Hamilton and Lewis Cass Ledyard as executors of the will of the late J. Pierpont Morgan, and William Rockefeller, Charles M. Pratt, and Mr. Ledyard as individual defendants have denied the charge in the complaint that the New Haven company or any of its subsidiary companies ever acquired any control of the Boston & Albany or the Metropolitan or Eastern Steamship companies. Continuing the answer, Mr. Rockefeller explained that prior to June 30, 1915, the then board of directors of the defendant company advised with counsel concerning the acts of former directors and whether an action for restitution should be begun against them. He said that it was decided not to begin such an action because the litigation was sure to be very expensive, complicated, and would probably be barren of any good result. This action, it was said, was thereafter indorsed by a vote representing 950,000 shares of stock out of a total of 1,571,000. Asa P. French, on behalf of the defendants, presented a resolution calling upon the directors to bring a suit for restitution, and this was defeated. Mr. Rockefeller said, by persons owning 925,124 shares of stock. Then the directors whose action had been indorsed by the stockholders, were re-elected. For these reasons the defendants ask that the suit be dismissed.

Railway Officers

Executive, Financial, Legal and Accounting

F. W. Schanck has been appointed auditor of the Georgia Coast & Piedmont, with office at Brunswick, Ga., vice R. E. Anderson.

Archibald G. Loomis who has been elected treasurer of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, succeeding F. G. Ranney, retired, was born at Hartford, Conn., on June 20, 1848. He began his business career as a clerk in a bank at Hartford and later served successively as discount clerk, teller, cashier, director and president. In 1899 he was elected vice-president of the National City Bank of New York, which position he held until 1906, when he was elected vice-president of the Union Trust Company at Providence, R. I. In the following year the bank was placed in the hands of the receiver and Mr. Loomis was given direct charge of its affairs. Several years later the bank was taken out of the receiver's hands and Mr. Loomis remained a vice-president until 1915, when he resigned.



A. G. Loomis

Clinton L. Bardo, general manager of the New York, New Haven & Hartford, has been appointed assistant to president. He will continue in general charge of the operating department, with headquarters at New Haven, as now. He was born on October 24, 1867, and began railway work in May, 1885, as a telegraph operator on the Philadelphia & Erie division of the Pennsylvania Railroad. He was in the service of the Pennsylvania about a year, and then worked for brief periods for the Philadelphia & Reading and the Tidewater Oil Company. In October, 1887, he went to the Lehigh Valley as telegraph operator, and was soon promoted to train despatcher. In 1892 he was assistant trainmaster, then trainmaster, and in 1901 was promoted to trainmaster of the New York division. In October, 1904, Mr. Bardo went to the New York, New Haven & Hartford as freight trainmaster at Harlem River, N. Y.; and he was made assistant superintendent of the division in 1905. In 1907 he was appointed superintendent of the Grand Central Terminal, New York City, and superintendent of the Electric division of the New York Central. He resigned this position in March, 1911, and returned to the Lehigh Valley as assistant to the general manager; but two years later, February 15, 1913, he resigned from the Lehigh Valley and was appointed general manager of the New Haven, which position he held until his appointment last week, as assistant to the president of the same road, as above noted.



C. L. Bardo

J. F. Maguire, former general manager of the Lehigh Valley, has been appointed assistant to vice-president in charge of operation, with headquarters at New York.

George C. Jones, vice-president of the Central Vermont at St. Albans, Vt., has been appointed assistant to president of the Grand Trunk with headquarters at Toronto, Ont.

W. D. Robb has been appointed vice-president of the Grand Trunk, in charge of motive power, car equipment and machinery, with headquarters at Montreal, Que. Mr. Robb was born at Longueville, Que., on September 23, 1857. He received his early education in Sherbrooke Academy and St. Francis College, Richmond, Que., entering the service of the Grand Trunk Railway System as an apprentice at Hadlow Cove, July 1, 1871. In 1873 he was transferred to Montreal, where he finished his apprenticeship as a machinist. In February, 1883, he was appointed night foreman at Point St. Charles shops, and in August of the same year he was promoted to the position of foreman at Belleville in charge of the motive power and car department. He became master mechanic of the Middle division, with headquarters at London, Ont., in January, 1897, and was appointed acting superintendent of motive power at Montreal in July, 1901. In May, 1902, he received his appointment as superintendent of motive power, which position he has since occupied continuously until his recent appointment as vice-president.



W. D. Robb

U. E. Gillen, general superintendent of the western lines of the Grand Trunk, at Chicago, Ill., has been appointed vice-president in charge of operation with headquarters at Montreal, Que. Mr. Gillen was born on February 27, 1867, at Brooklyn, Mo., and was educated in the public and private schools. He entered the service of the Chicago, Milwaukee & St. Paul in 1884, as a clerk at Canton, S. D. During the same year he learned telegraphy and served as telegraph operator and relief agent until April, 1885, when he went as telegraph operator to the Missouri Pacific, at Pacific, Mo. He was promoted in 1888 to operator in the train despatcher's office at St. Louis; in 1892 he was promoted to train despatcher and subsequently served as chief train despatcher until 1901 when he went to the Grand Trunk as trainmaster at Belleville, Ont. In 1902 he was promoted to assistant superintendent at Belleville. Two years later he was again promoted to assistant superintendent at London, Ont., and in 1907 became superintendent at Toronto. He was transferred in 1912 to Montreal as superintendent and the following year he was promoted to general superintendent at Chicago, which position he held until his recent appointment as vice-president in charge of operation of the same road, as above noted. In 1916 Mr. Gillen served as president of the Grand Trunk Railway Maintenance of Way Association and in 1917 he was elected president of the General Superintendents' Association of Chicago.



U. E. Gillen

James Russell, until recently vice-president and general manager of the Minneapolis & St. Louis, has been appointed general manager of the St. Louis Southwestern vice W. T. Tyler, who continues as first vice president of the Texas properties, both with headquarters at Tyler, Texas.

L. R. Watts, general counsel of the Seaboard Air Line, at Portsmouth, Va., has been appointed consulting counsel, and E. Marvin Underwood, assistant attorney general of the United States, of Atlanta, Ga., has been appointed general counsel, with headquarters at Norfolk, Va., to succeed Mr. Watts.

F. G. Ranney, treasurer of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, who has resigned, effective September 1, began his business career as a bookkeeper with the Western Union Telegraph Company on February 22, 1866. In September, 1874, he was promoted to secretary and treasurer, and in 1879 entered the service of the St. Paul as cashier. In 1882 he was promoted to assistant treasurer of the same road, and on February 23, 1887, became treasurer, which position he held until his retirement.

Operating

R. E. Hoard has been appointed inspector of transportation of the Delaware & Hudson, with headquarters at Albany, N. Y.

C. P. Stempel, superintendent of the Minneapolis & St. Louis, at Minneapolis, Minn., has been appointed general superintendent of the Virginian Railway, with headquarters at Norfolk, Va.

He was born on October 3, 1868, and graduated from Shattuck Military School at Faribault, Minn., in June, 1887. He began railway work in 1889, as a clerk in the office of the ticket auditor of the Chicago Great Western, and subsequently held consecutively various positions in the auditing department. From September, 1892, to September, 1894, he was traveling accountant, then for one year was chief clerk to the general superintendent. In September, 1895, he was appointed assistant to the general manager, and from September,

1899, to July, 1900, he was superintendent of terminals at Oelwein, Iowa. He was then to March, 1905, superintendent of the Southwestern division, and then to July, 1908, was superintendent of the Eastern division, all on the Chicago Great Western. On July 1, 1908, he was appointed assistant to vice-president of the Chicago Union Transfer Railway, and the following January he was appointed superintendent of the Minneapolis & St. Louis, which position he held at the time of his recent appointment as general superintendent of the Virginian Railway.

Frederick T. Gibbs has been appointed trainmaster of the Illinois Central, with headquarters at Centralia, Ill., succeeding Donald L. Carlyle, assigned to other duties.

John L. East has been appointed superintendent of freight service of the Illinois Central, and the Yazoo & Mississippi Valley, with headquarters at Chicago, effective September 1. This is a new office created with a view to increasing the efficiency of the loss and damage bureau.

W. R. Davidson, superintendent of the Grand Trunk at Detroit, Mich., has been appointed general superintendent of the western lines, with headquarters at Chicago, succeeding U. E. Gillen, promoted; and T. King has been appointed superintendent of the Detroit division, with headquarters at Detroit, succeeding Mr. Davidson.

H. E. McGee, formerly superintendent of the Missouri, Kansas & Texas, at Greenville, Tex., and recently transportation officer of the government training camp at Waco, has been ap-

pointed superintendent of the Oklahoma district of the M. K. & T., with headquarters at Oklahoma City, Okla., succeeding S. H. Charles, granted a leave of absence; H. B. May has been appointed trainmaster of the Osage division, including the Osage terminal, with headquarters at Parsons, Kan., succeeding F. W. Grace.

James Berlingett having resigned as general manager of the Virginian Railway, the duties of that office were taken over on September 1, by E. E. Kerwin, vice-president, at Norfolk, Va. E. D. Hanes has been appointed superintendent coal terminals, Sewalls Point, Va., vice W. A. Young, resigned to accept service with another company.

George W. Wildin, mechanical superintendent of the New York, New Haven & Hartford, has been promoted to the position of general manager of that company, succeeding C. L. Bardo

who has been promoted to the position of assistant to the president. Mr. Wildin has been in the service of the New Haven since July, 1907. He was born at Decatur, Ill., February 28, 1870, and graduated from the Kansas State Agricultural College with the degree of bachelor of science in June, 1892. He entered railway service shortly afterwards as a mechanical draftsman in the Topeka shops of the Atchison, Topeka & Santa Fe. He subsequently became a machinist and locomotive fireman on the Santa Fe and later an

engineman on the Mexican Central. Leaving railway service he was for a while superintendent of the Acme Motor Company, Chicago. He returned to railway service shortly, however, as an engineman on the Chicago & Alton and then went to the Plant System, now a part of the Atlantic Coast Line, where he served successively as a machinist, a locomotive and car inspector and as mechanical engineer. From April 1, 1901, to March 1, 1904, he was mechanical engineer of the Central of New Jersey. On March 1, 1904, he left that company to become assistant mechanical superintendent of the Erie, being promoted on April 1 of the same year to mechanical superintendent at Meadville. From January to July, 1907, he served as assistant superintendent of motive power of the Lehigh Valley and then left that road to accept a position as mechanical superintendent of the New Haven. In May, 1917, he was promoted to general mechanical superintendent, and it is this position he leaves to take up his new duties. Mr. Wildin was president of the American Railway Master Mechanics' Association in 1910.

Traffic

P. M. Havens, commercial agent of the Cincinnati, Indianapolis & Western, with headquarters at Indianapolis, Ind., has been appointed general agent, with the same headquarters, succeeding A. M. Waldo, deceased.

R. H. MacDonald, city passenger agent of the Missouri Pacific at New York, has been appointed general agent of the passenger department, with the same headquarters, succeeding R. T. G. Matthews, granted a leave of absence.

J. W. Stevenson, traveling freight and passenger agent of the Chicago, Milwaukee & St. Paul at Bellingham, Wash., has been appointed commercial agent, with headquarters at Vancouver, B. C., succeeding A. W. Nasc, who has been transferred to Bellingham, Wash.

Engineering and Rolling Stock

J. M. Brown, assistant engineer maintenance of way on the Cleveland, Cincinnati, Chicago & St. Louis at Springfield, Ohio, has been appointed acting engineer maintenance of way of the



C. P. Stempel



G. W. Wildin

Indianapolis terminal division, with headquarters at Indianapolis, Ind., succeeding C. F. Hinchman, granted a leave of absence.

G. O. Hammond, assistant general mechanical superintendent of the New York, New Haven & Hartford, at New Haven, Conn., has been appointed general mechanical superintendent.

H. B. Brown, general fuel inspector of the Illinois Central, at Chicago, has been appointed superintendent of the fuel department of the Lehigh Valley, with office at South Bethlehem, Pa.

W. H. Sample, master mechanic on the Grand Trunk at Montreal, Que., has been appointed superintendent of motive power, with the same headquarters; G. M. Wilson, assistant master mechanic at Montreal, has been appointed master mechanic of the Montreal shops, with the same headquarters, in place of A. A. Maver, retired.

R. W. Burnett has been appointed master car builder of the Delaware & Hudson, with office at Albany, N. Y. Mr. Burnett was born at Farmer City, Ill., in 1868, and in 1890 entered the service of the Union Pacific in the car department at Denver, Colo. In 1892 he was connected with the Pennsylvania Railroad at Chicago as a car inspector, and from August, 1892, to July, 1899, was with the Lake Shore & Michigan Southern at Chicago as a foreman and general foreman of the car department at Englewood. The early part of 1900 he spent as general foreman of the car department of the Long Island, going in the latter part of the year to the Central of New Jersey at Elizabethport, N. J., as general foreman of the car department. He remained with that road until 1904, and then went to the Erie, and served on that road in the capacities of assistant master car builder and master car builder, with headquarters at Meadville, Pa., until January, 1907. He left the service of the Erie to go with the Canadian Pacific as assistant master car builder, and in 1909 was promoted to general master car builder. In 1913 he was also elected vice-president of the Master Car Builders' Association. In November, 1915, he left the service of the Canadian Pacific and has since been vice-president of the National Car Equipment Company, Chicago.

E. R. Battley, general foreman motive power department of the Grand Trunk at Decatur, Me., has been appointed master mechanic of the eastern lines with headquarters at Montreal, Que., and A. McDonald, foreman of the erecting shop at Stratford, Ont., has been appointed assistant master mechanic, with headquarters at Montreal shops.

W. L. Bean, who has been acting as assistant to the president of the New York, New Haven & Hartford, has been appointed assistant to the general mechanical superintendent. He was born on January 3, 1878, at Stevens Points, Wis., and graduated from the University of Minnesota with the degree of mechanical engineer in 1902. The same year he began railway work with the Northern Pacific as special apprentice. In December, 1904, he went to the Atchison, Topeka & Santa Fe, serving successively as erecting shop foreman, locomotive inspector at the Baldwin Locomotive Works in Philadelphia, and machine shop foreman at La Junta, Colo. In January, 1909, he was appointed division foreman at Belen, N. M., and the following July was appointed motive power assistant at Topeka, Kan. On February 1, 1912, he became chief engineer for the Oswald Railroad Service Company, at Chicago, and on July 10, 1916, he entered the service of the New Haven, and since that time has been acting as assistant to the president.

Railway Officers in Military Service

J. de N. McComb, office engineer of the Atchison, Topeka & Santa Fe, at Chicago, has been commissioned captain in the

Engineer Officers' Reserve Corps, and has been assigned to duty at Ft. Leavenworth, Kan.

J. W. Reid, bridge engineer of the Chicago & Alton at Chicago, and R. A. Cook, valuation engineer, who were commissioned captains in the Engineer Officers' Reserve Corps, have been assigned to duty at Ft. Leavenworth, Kan.

Special

J. Hampton Baumgartner, publicity representative of the Baltimore & Ohio, has resigned, effective September 1, to become assistant to the president of the National Association of Owners of Railroad Securities.

He was born in Westminster, Md., in 1887, and prior to his appointment as publicity representative of the Baltimore & Ohio, was employed in the office of the vice-president. The organization with which he now becomes affiliated was founded recently at a meeting of bondholders and stockholders of the American railroads at Baltimore, Md., when steps were undertaken to insure the stability of securities, representing in the aggregate more than \$17,000,000,000 of capital. The initial conference

was attended by 500 financiers and individual investors. In addition to Mr. Baumgartner and S. D. Warfield, president of the association, there are five vice-presidents in different sections of the country, who make up the executive personnel of the organization. Mr. Baumgartner has been in charge of the publicity department of the Baltimore & Ohio since July, 1911, and has been identified with the various national publicity campaigns conducted by the railroads to educate the public concerning the problems facing the roads.



J. H. Baumgartner



R. W. Burnett

OBITUARY

Martin N. Todd, president of the Galt, Preston & Hespeler, and general manager of the Lake Erie & Northern, at Galt, Ont., died suddenly on August 29, at the age of 59.

P. H. Leonard, general western live stock agent of the Erie, with headquarters at Chicago, died at St. Luke's hospital, Chicago, on September 1, following an operation.

E. S. Koller, vice-president and general manager of the Colorado & Southern, with headquarters at Denver, Colo., died at his home at Denver on September 2 after a ten-day illness.

John F. Enright, superintendent of motive power and car department of the Denver & Rio Grande, died at his home in Denver, Colo., on September 4, after an illness of about one year.

Charles L. Crandall, professor emeritus at Cornell University, with which he was associated for nearly 50 years, died at his home at Ithaca, N. Y., on August 25. While active in many branches of civil engineering, he specialized in railway work and was well known among railway engineers as a teacher and as an author of several texts and handbooks treating on various railway engineering subjects, including transition curves, earth-work tables, railroad surveying and railroad construction. He was a member of the American Railway Engineering Association, taking an active part in the work, particularly that of the committee on Iron and Steel Structures. Professor Crandall was born at Bridgewater, N. Y., in July, 1850, and entered Cornell University when that institution was opened, graduating with the first regular class in 1872. After two years of engineering experience he returned to the institution and was made a member of the instructional force, with which he continued until his death, serving in turn as instructor, assistant professor, professor of railway engineering and for the last two years as professor emeritus.

Railway Age Gazette

Volume 63

September 14, 1917

No. 11

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GENERAL NEWS SECTION

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There is only a little over two weeks left before the close of the contest which the *Railway Age Gazette* has announced for the best papers discussing the reconsignment privilege.

The Reconsignment Privilege Contest

officers whose duties are affected by the reconsignment of shipments and this, of course, includes both operating officers and traffic officers, yardmasters and station agents and many others, are urged to send in to the New York office of the *Railway Age Gazette* a paper discussing this subject. Papers should be sent in before September 29. As was stated in the first announcement, we are particularly anxious to get just as much material bearing on this subject, going into some detail and citing specific instances, as is possible. The prizes are \$50 for the best paper and \$25 for the second best paper. All material used in addition to the two prize articles will be paid for at our usual rates.

"The situation would thus appear to be that whilst such men, materials, and rails as may be found requisite for Sir Douglas Haig's requirements as further enemy areas are occupied may be supplied from the United States, the demands for engine power must necessarily be met from France and Great Britain."

The quotation is from the *Railway Gazette* (London) of August 17. The *Railway Gazette* is right in one respect; namely, that the American railways probably cannot be called upon to supply cars and engines for service on the French railways. "The difference in the dimensions of the structure gage prevents this," says the *Gazette*. "The maximum height for a locomotive in France is somewhere about 173.2 in., whereas the American locomotive demands a headway of 178.75 in. As to width, the French locomotive calls for a clearance of about 114.1 in. as against a width of 122 in. for the American locomotive. The difference in the height and width of the French and American freight cars is greater still." But the *Railway Gazette* misses the point; it forgets entirely the American railway supply field. The locomotive companies have already supplied numbers of standard gage locomotives for the British War Office and for the Paris-Lyons & Mediterranean Railway of France, and locomotives are being built for the Paris-Orleans and the French State Railways. The

car builders have supplied large numbers of cars for the French State Railways and the Canadian builders for the Paris-Orleans, the P. L. M., the Northern Railway and the State Railways. But most important of all, American builders are to build 680 standard gage Consolidations and 9,000 standard gage freight cars and a large amount of narrow gage equipment for our own forces overseas. We will agree with the *Railway Gazette* that perhaps the American railways cannot supply locomotives and cars for service in France as the railways in England have done. The *Railway Gazette* must agree with us that the American railway supply field will give a good account of itself when it comes to supplying equipment that the American railways may not be able to supply for the military and other railways behind the allies' lines in France.

The automobilist who risks his life on a railroad crossing without looking out for trains—like the tramp who steals a ride on the "blind baggage" and is crushed between the cars when a wreck occurs—forfeits everybody's sympathy by the very patent recklessness of his course. To avoid the danger is so obviously the simple and rational course that there are no two ways of looking at the question—though cunning lawyers do contrive to get it before the courts frequently. But the reckless automobilist often, perhaps usually, risks others' lives besides his own; so that the problem of preventing the horrible crossing slaughters, which are now so frequently reported, is far from simple. The Nebraska Supreme Court, in a decision reported in the *Railway Age Gazette* August 31, page 400, declares that persons riding in an automobile and knowing of the existence of danger on approaching a railroad, have a duty to warn the driver; or, at least, to do whatever is possible to save themselves. Neglecting this, they have no claim on the railroad. And no one, thinking what he himself would do, in such a situation if he realized its true gravity, will dispute the logic of the court. This is a phase of the matter on which railroad safety specialists, in the very commendable missionary circulars and lectures by which they endeavor to recall highway travelers to their senses, may well lay emphasis. This ignorance or thoughtlessness is particularly pathetic when all or most of the victims of their own unwise trust in a

Responsibility of Automobile Passengers

driver are young and innocent children, as was the case at Saybrook Junction, Conn., August 20. And the lesson has a wide application. Near Perryman, Md., August 30, seven farm laborers, riding to their work on a wagon drawn by mules, were killed on a crossing. The party approached the railroad through a cut five feet deep, with tall corn growing in the adjacent field, so that, in the words of the despatch, "their vision was obscured." Like thousands of other people, if we may believe innumerable stories told in the courts, these men took no thought of the fact that their hearing was not obscured, except as they voluntarily obscured it. Even dumb animals seem, in some respects, to be wiser than men. A cat, or a horse, approaching that crossing, having the knowledge that those men possessed, would have used its ears as well as its eyes.

On Wednesday of this week the Railway Business Association gave an informal luncheon at the New York Railroad

Australian Government Officials in America

Club at which the guests of honor were the Right Honorable W. A. Holman, Premier of New South Wales, and Honorable H. C. Hoyle, until recently minister of railways of New South Wales and now special representative of New South Wales in this country studying American railroad methods. Both the Premier and Mr. Hoyle spoke informally and frankly and the Railway Business Association may well be congratulated. There are in operation in New South Wales nearly 5,000 miles of railroad. This is government owned and operated. Neither Mr. Holman in his wonderfully interesting talk, nor the former minister of railways made any concealment of the somewhat sinister ring which government ownership has for American railroad men. The success which they claim for the government operated railways of New South Wales is based apparently in part on the very high standard of political life in that state, and in part on the fact that the commissioner of railways, who is, of course, a political appointee, has no control over the appointment of officers or employees of the railways, but deals only with the broader aspects of management, such as rates, service, extensions, and so on. It was particularly interesting to note the stress which was laid on the duty of the railroad to the pioneer settlements. No hesitation apparently is felt in reducing rates to a point far below cost of service where it is necessary to help the sheep raiser move his flock during a time of drought, and in general apparently a paternalistic rather than a strictly business point of view is adopted by the minister of railways in the administration of his duties. The visit of these two distinguished Australians to this country is of interest not only to railway supply men, but also to American railroad officers. Australia is giving freely to the cause of the Allies in the war. When the war is over not only will railway supplies be needed, but there is every prospect that there will be openings in that country for American settlers, including American railroad men.

"I've been seeing what you've been saying about courtesy," said one of our laymen friends the other day. "I will tell

The Courtesy Killer

you something that happened to me on Labor Day. 'Go ahead, boss,' I said to another fellow as he came up to the ticket window beside me. 'Thanks,' he said, 'I'm in a hurry and want to catch the——'. 'See here,' said a ticket agent, a courtesy killer on the inside of the ticket window; 'let me run this ticket office, will you?' I replied: 'Sell that fellow his ticket and let him get his train before they shut the gates, I came here to ask a question, not to pick a fight. What's the fare to Sweetwater Beach?' '\$1.85.' 'You run an excursion on holidays, don't you?' 'Yes, \$1.00.' 'Well, give me two tickets.' 'We don't sell 'em here. Get 'em

outside.' 'Outside! What do you mean by outside?' 'There will be somebody outside to sell them at \$1.20.' It was noon then and I was getting madder every second, but that ticket man just then stepped back out of sight behind his cases, so I couldn't get anything further out of him, or tell him what I thought of him. And not an intimation did he give me, mind you, that the excursion ticket was good only on the train returning at 10 p. m., about four hours later than I could wait for. I was the only person at the window. He wasn't the least bit rushed and I was as polite as I could be. This occurred only last Labor Day, and on a railroad that, judging from its other actions, realizes that we are at war and professes to understand that now as never before railways must do their utmost to keep the public's favorable impression. The best "courtesy-first" agent and favorable impression creator a railway can have is its ticket agent, and it is hard to believe that a railroad would allow such discourtesy as was evident in this agent, who was actually making enemies for his railroad right and left on one of the busiest days of the year when prospective friends were coming fastest. This would-be passenger and many others who must have suffered the same experience are voters. Are they going to impress upon their legislators that they do not believe in nagging railroads, when they themselves feel that they must be on their guard to keep from being insulted every time they go to a ticket office on that railroad?

A CASE OF RECIPROCAL DISCRIMINATION

THE United States Food Administration, in regulating the prices of wheat at the various markets, has been having some of the same experiences that have beset the railroads and the Interstate Commerce Commission in their efforts to adjust freight rates. The other day it gave out a laconic statement as follows: "The Food Administration has received complaint by wire from Chicago protesting that the announced differentials in wheat are plainly discriminatory against Chicago and in favor of St. Louis. From St. Louis the Food Administration has received by wire the complaint that the differentials in wheat as announced are plainly discriminatory in favor of Chicago as against St. Louis."

Apparently the Food Administration believes that this offsetting of the two complaints is pretty good evidence of its fairness and possibly the same idea is responsible for the fact that the perennial charges of shippers that their products or their communities are being discriminated against by the railroads in the adjustment of freight rates have for a long time aroused much less public interest than formerly. There was a time when the public was so little informed about railway affairs that the term "discrimination" was popularly considered almost tantamount to "rebate," but as regulation has progressed and rebates have become a matter of ancient history, the enterprising traffic managers of the shippers have so overworked their charges of discrimination that the word has lost somewhat of its former flavor. Of course, "discrimination" simply means "difference" and it is only "undue" discriminations that are unlawful, but it is a very unimaginative industrial or civic traffic manager who cannot find arguments to convince himself that a discrimination is "undue."

In the early days of the car shortage of last winter the Interstate Commerce Commission was flooded with complaints from shippers who were not being furnished with all the cars they could load and most of them included bitter charges that their state or city or commodity was being discriminated against, because obviously some shippers had cars. Under such circumstances, however, the more complaints that someone else was getting the cars, the better the evidence that they were being somewhat fairly distributed. When the facts became better understood and there was a more widespread realization that there was a general shortage of transportation facilities in comparison with the unprecedented volume of business to be moved, some of those who had been loudest in

their complaints discovered that they were all in the same boat and much of the indignation subsided into a sincere effort to co-operate in making the best of the situation.

RETURNS FOR JUNE AND THE HALF YEAR

THE returns of railway revenues and expenses for June and for the first six months of the year 1917 show that the railways of the United States are still breaking all previous records except in the vitally important item of operating income, which represents what is left, after expenses and taxes are paid, as a return on the capital invested and therefore determines the credit of the railways and their ability to finance improvements or additions to their facilities. They are, therefore, in much the same position as the man whose pay has been raised, but not quite enough to keep up with the increased cost of living. Total operating revenues for June were greater than for any previous month in history, the total of \$349,739,636 being about \$4,000,000 greater than for May, in which the highest earnings for a month were previously recorded, and \$49,720,256 greater than for June, 1916; this is an average increase of 16.3 per cent per mile. The figures for six months of the year show a decrease in operating income per mile of 4.2 per cent, as compared with the first six months of 1916. The total revenues for the six months were over \$201,000,000 greater than in 1916, but expenses were \$207,000,000 greater, taxes were \$12,500,000 more and the operating income was therefore over \$18,000,000 less. These facts explain clearly why the stocks of some of our best railroads are selling at prices less than when the exchanges closed in July, 1914, and why in the same week that the figures were issued by the Interstate Commerce Commission, Pennsylvania fell below par for the first time in 20 years.

For the month of June total operating revenues reached the record figure of \$1,514 per mile of line, as compared with \$1,301 in June, 1916, and \$1,498 in the month or May. This was an increase over June, 1916, of 16.3 per cent. Operating expenses, \$1,020 per mile, increased 19.8 per cent per mile over June, 1916, but were slightly less than for May, thereby reflecting the remarkable improvement in operating efficiency being obtained in the way of securing increased tonnage and mileage for each freight car and locomotive in service. The decrease in expenses in June, as compared with May, is largely accounted for by the expenditure of \$10 a mile less for maintenance of equipment.

Operating income for June was \$422 a mile, 8.1 per cent greater than for June, 1916. Taken by themselves the June figures make the best showing of any month this year, although for the roads in the eastern district operating income per mile decreased 1.4 per cent.

When the six months' figures are compared, however, the effect which the unprecedented increases in expenses of all kinds are having, in spite of the stupendous increase in the volume of business and in gross earnings, becomes plainly apparent. Total operating revenues were \$1,898,210,538, as compared with \$1,697,051,238 in the first six months of 1916, an increase per mile of line of 11.6 per cent. Operating expenses were \$1,354,295,938, as compared with \$1,147,093,778, an increase per mile of 17.7 per cent. Net operating revenue was \$543,914,600, as compared with \$549,957,460, a decrease per mile of 1.4 per cent, while taxes increased from \$76,241,598 to \$88,936,624, or 16.3 per cent, and the operating income was \$454,661,633, as compared with \$473,295,808, a decrease of 4.2 per cent.

The biggest increase in expenses is naturally found in the cost of conducting transportation, in which wages and the coal bill are the most important factors. This item shows an increase for the six months of \$147,000,000. Maintenance of way and structures expenses increased \$14,000,000; maintenance of equipment, \$35,000,000; traffic expenses, less than \$2,000,000; while miscellaneous and gen-

eral expenses account for an increase of about \$9,000,000. These items make up the total increase of \$207,000,000 in expenses, or from \$4,977 to \$5,861 per mile of line.

Formerly June 30 marked the close of the fiscal year. However, if the returns of the first half of this year be added to the last half of 1916, we get the following comparisons:

	Total Operating Revenues (millions)	Operating Expenses (millions)	Net Operating Revenues (millions)	Operating Income (millions)
Year ending June 30, 1917....	\$4,824	\$2,581	\$1,242	\$1,069
Year ending Dec. 31, 1916....	3,622	2,373	1,248	1,089
Year ending June 30, 1916....	3,396	2,220	1,176	1,079

In other words, with an increase in earnings of over \$200,000,000 over the calendar year and of over \$400,000,000 over the fiscal year 1916, operating income for the 12 months ending June 30, 1917, was \$20,000,000 less than in the calendar year and only \$40,000,000 greater than for the fiscal year, the increase in what is loosely termed profits being only one-tenth of the increase in earnings.

ANTI-RAILWAY STATESMEN WHO ARE ALSO ANTI-AMERICAN

ONE of the most interesting features of the discussions of the war and of war measures has been that almost every man in Congress who in past years has been notorious for attacking and misrepresenting the railways has turned up as an opponent of measures necessary for the vigorous prosecution of the war.

Of all men in public life, Senator La Follette of Wisconsin has been the most consistent and persistent in assailing and misrepresenting the railways. He has been just as anti-United States on questions affecting the conduct of the war as he has been anti-railroad on all questions affecting the railways, and has resorted in the one case to the same kinds of agitation and misrepresentation as in the other. He was the leader of that "little group of wilful men" whom President Wilson scarified in one of his public utterances for defeating war legislation. That entire group was composed, with one exception, of men who had made their way in public life by attacks on the railroads.

Consider the list of those who are most prominent now in anti-war and anti-American activities—Johnson of California, Gronna of North Dakota, Reed of Missouri, Gore of Oklahoma, Vardaman of Mississippi, Norris of Nebraska, and so on. There are some exceptions, but a complete list of the members of Congress, and especially of members of the Senate, who have been anti-American in the war would almost serve as a list of the habitual railway baiters in Congress.

Why is this the case? We have reflected on that subject a good deal, and we have reached the conclusion that the attitudes of these men toward the war and toward the railways are effects of the same cause, and that that cause is a disposition to promote their own political interests by any means that they believe will accomplish that object, regardless of the consequences to the nation as a whole.

Many men in public life criticized the railways when there were serious and notorious abuses to be corrected; but it was left to a few to continue these criticisms after regulation and improved management had corrected the abuses in question. If it be said that these few are inspired by intelligence and worthy motives, may we not suggest that it is a remarkable coincidence that almost exactly the same men are following a course in regard to war measures which public opinion generally condemns as based upon ignorance, or bad motives, or both?

At any rate, the railways are now in a position to suggest to the public that it ought to love them for the enemies they have made. They are also in a position to suggest to the public that possibly those who are so far wrong in their attitude toward the war may also be wrong in their attitude toward the railways. Finally, the railways may congratu-

late themselves on the fact that, by men such as those mentioned taking the course they are regarding the war, a lot of their worst enemies are rapidly preparing themselves for political burial.

Meantime, does the public grasp the significance of the difference between the course of these anti-railway agitators and that of the railway managers? La Follette, Reed, Johnson and that crowd are doing, in their own ways, all they can to help the country lose the war, while the railway managers are doing in their own way all they can to help the country win the war. The nation should take note of this fact now so it will remember it when the war is over.

THE M., K. & T. REORGANIZATION

THE Missouri, Kansas & Texas is in the process of financial reorganization. It has been in the hands of C. E. Schaff, its former president, as receiver since September, 1915. As is almost inevitable in any reorganization of a bankrupt railroad property, wide differences of opinion have developed among the many conflicting interests that must be eventually brought together as to what principles should be pursued. Divergent opinions are not only natural, but salutary. Seldom, however, has there been presented so clearly a joining of issue on the fundamental principles which shall guide in a reorganization. One group of bankers is planning a reorganization in which just as little sacrifice is to be asked from holders of securities as is possible, and to speak plainly, funds are to be raised for setting the property on its feet secured by the hopes and prospects of the future development of the property. This principle has been carried out in a number of reorganizations in American railroad history and it is not to be denied that some of them, because of the very rapid growth of the country in the period between 1895 and 1906, proved successful. On the other hand, many have ended simply in another receivership. Under this theory, security holders have received face value of new securities equal to their old securities, plus assessments.

Another group of bankers proposes actually to cut down not only fixed charges, but face value of many classes of securities, to call on holders of the old securities to make considerable sacrifices and to base the fixed charges of the new company not on what may be hoped to be the net income available for interest, but on the lowest amount that will under even adverse circumstances be available for interest.

There would be very little difficulty experienced in choosing between these two fundamentally opposite theories of reorganization as a matter of abstract economics, but the processes of putting through a reorganization is a very practical matter of dealing with human nature. The same officers of life insurance companies who would consider only buying securities of a property which had been reorganized strictly on the second theory and would refuse absolutely to consider securities of a company reorganized on the first principle, will fight tooth and nail for a mild reorganization of a property of which they own securities. It is rather curious to see what dependence even intelligent men dealing with large sums of money constantly place on the face value of securities regardless of how great or how little is the value back of the securities issued. In the reorganization of the Missouri, Kansas & Texas the potential, or rather actual earning power of the property will be the same under either reorganization. The income available for interest will be neither greater nor less, if the property is soundly managed in both cases, with a large volume of securities outstanding or a small volume.

The danger lies, however, in the fact that the property will not be managed in the same way if a large volume of securities is issued as it will be if a small volume is issued, and it is this very fact probably which makes security holders so anxious to enter a reorganization only if the face value of their holdings is to remain untouched. Most railroad men

who have been in the game for a considerable number of years have had the bitter experience of working for a property which was being systematically undermined in the attempt to meet the interest on securities which did not actually reflect the real earning power. Poor service to the public always follow from conditions such as these. There have been instances where an entirely extravagant service has been rendered by a road headed toward bankruptcy in an effort to increase gross earnings, but the property itself, its organization, and in the long run its value to the community as a whole suffers greatly under such a stress.

The Missouri, Kansas & Texas in the calendar year 1916 earned \$36,734,000 gross, an increase over the previous year of 13 per cent, but spent in operating expenses \$29,440,000, or 27 per cent more than in the previous year and had available for interest \$5,433,000, or 23 per cent less than in 1915. This amount would have been \$1,135,000 short of the accrued interest on the outstanding securities.

Since the receivership there have been various reports made on the property by experts, among others one by J. W. Kendrick, formerly vice-president of the Atchison, Topeka & Santa Fe. Mr. Kendrick's report carries a weight of authority given it by his high reputation. The publication of this report was followed by a letter from C. E. Schaff to some of the bankers working on the reorganization, agreeing in a large part with Mr. Kendrick's comments, but differing in certain details, and most important of all, pointing out that the estimated income account for 1920 was based on a hope for the most favorable conditions of operation and earnings. Mr. Schaff estimated, even allowing for average good conditions, an income available for interest in 1920 of \$8,108,000 as against Mr. Kendrick's estimate of \$11,250,000.

A letter has now been made public which is dated May 3, 1917, written by Mr. Kendrick to Speyer & Company of New York, which is one of the New York firms of bankers interested in the reorganization. The letter is somewhat unfortunately written in a rather controversial spirit, but the purport of it is that the estimate of \$11,250,000 income available for interest in 1920 is conservative and the implication of it is that if this figure is not realized, it will be in large part the fault of the management itself. Into this question it is not our intention to go. It should, however, be pointed out that from the security holders' point of view and from the point of view of the public and from the standpoint of all those who desire to see the credit of American railroads raised from its present poor state, it is not so important to allocate the blame for failure in 1920 between hard luck, floods, bad crops, adverse legislation and unenterprising management, as it is to so reorganize the property now that if such failures do occur they will not result in disaster in 1920, or in a few years following that time. That is the point that ought to be kept clearly in mind and separated from the details of controversial matters. Mr. Kendrick may be entirely right in his estimates, but his estimates are based on the best that can be hoped for and the last two sentences in his letter to Speyer & Company drive home this point. He says: "Increasing rates are necessary to the continued efficiency of the railroads and are expected by everyone. This letter is written with the belief that this expectation will be realized."

Increased rates were not granted on an extensive scale to the western roads; neither can anyone foresee what effect the demands for steel for government purposes will have on the possibility of adequate maintenance; neither can anyone foresee what effect the termination of the war will have on the prosperity of the country as a whole. Here is squarely presented a case where enlightened self-interest, if it is far-sighted enough, would dictate that a reorganization of the Missouri, Kansas & Texas be made on a basis of interest charges that will be amply met even if unforeseen circumstances prove Mr. Kendrick 50 per cent too high in his estimate of income in 1920.

Letters to the Editor

PRESIDENT MARKHAM ON THE PROBABILITY AND DESIRABILITY OF GOVERNMENT OWNERSHIP

CHICAGO.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I have read recently a newspaper interview given by President E. P. Ripley of the Atchison, Topeka & Santa Fe in which he expresses the opinion that "government ownership of railways in the United States is not only a possibility, but a high probability." He has expressed this opinion before.

Mr. Ripley occupies deservedly a very prominent place among the railway executives of this country. Therefore, if his utterances on this subject are allowed to pass without challenge from railway sources, they may be accepted by the public as expressing the views of railway executives. I do not think most railway executives agree with him on this matter. Certainly I do not. On the contrary, I think we are moving away from government ownership, and that recent developments, especially since the United States entered the war, have made its adoption less probable. Among my reasons for thinking this are the following:

First, it has been contended by advocates of government ownership that the government could raise enough capital to acquire the railways at 3 per cent, or even less, and that, therefore, a large saving could be made by substituting the credit of the government, as the owner of the railways, for that of private companies. Experience during the present war has answered this argument. Our government is paying 3½ per cent on the Liberty Loan bonds, which are tax free, and yet they are selling at slightly below par. It is understood that it will pay 4 per cent on the next large issue of bonds. The leading governments of Europe are paying 6 per cent and even more. Experience indicates that, conditions as to taxation and other matters being the same, the difference in the rate of interest on capital which a strong government and a strong railroad have to pay is not more than one-half of one per cent.

Second, it has been argued that the consolidation of the railways under government ownership would make it possible to effect large economies. One reason why our railways have not in the past effected all the economies possible has been that the government, through the Sherman anti-trust law and the anti-pooling section of the Act to Regulate Commerce, has prohibited them from curtailing wasteful competition. When we entered the war the prohibition against concerted action and unified operation ceased to be enforced and with the helpful co-operation of shippers the managements of the railways have since then made increases in efficiency that are remarkable. In 1916 they handled much more freight with each mile of line, each car and each locomotive than ever before; but they are at present far exceeding the record made in 1916. For example, in June, 1917, they handled 23 per cent more freight traffic with each mile of line, 21 per cent more with each freight locomotive, and 20 per cent more with each freight car than they did in June, 1916. These results show what the railways can do under private management when they are given a fair chance, and they undoubtedly surpass anything that could be accomplished by a consolidated government system with all of the red tape, waste and incompetency which ordinarily characterize government management.

Third, it was formerly argued that the railways ought to be acquired by the government so that in case of war they could be used with the greatest effectiveness for national de-

fense. The course followed by the railway managements, since the United States entered the present war, has resulted in our railways being made a more potent instrumentality of national defense than they probably would be if owned by the government. Within five days after the declaration of war, the railways had voluntarily organized themselves for doing their part, and the government has never expressed a wish with which they have not immediately and efficiently complied.

Fourth, when we entered the war the national debt was only about one billion dollars. It will soon be many billions. The railways represent an investment of approximately twenty billion dollars. The proposition that the government should acquire the railways when its debt was so small was very different from the proposition that it should add an indebtedness representing the cost of acquiring the railways to the huge debt that will result from the war.

It may be said that such facts as the foregoing are good reasons why this country should not adopt government ownership, but that they do not make its adoption any less probable. I believe, however, that the more intelligent part of the public is familiar with such facts; that it is quite feasible to make the public generally familiar with them; and that when the public generally does know them, it will see that they show that from the standpoint of the public welfare, government ownership is not only unnecessary but highly undesirable.

Recognition of the fact that, from the standpoint of the public, government ownership is undesirable will tend to cause the public to make regulation more reasonable and fair, and therefore to make government ownership more and more improbable.

C. H. MARKHAM,
President, Illinois Central Railroad.

DETERIORATION OF RAILWAY TRACK

AMARILLO, Texas.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Your editorial of August 31, "Arrest the Deterioration of Railway Track," was certainly a proper warning. With 29 per cent increase in traffic there is only about nine per cent increase in expenditures for maintenance, which is more than accounted for by increases in wages.

Travelers on all busy lines notice that track is getting rough in spots, that roads heretofore noted for smooth riding are not up to standard. While none are noticeably bad as yet, they are losing ground and deterioration will soon be evident to passengers and later will tend to cause accidents, reduce capacity and cripple commerce.

This condition is due mainly to a shortage of labor. Material and money will not help without labor. The roads have increased wages, but trackmen are not available. National defense demands that track and equipment be maintained at a high standard, and under present conditions it will soon be necessary to draft men to work on track unless they can be obtained by importation or immigration. Congress, at the instigation of short-sighted sentimental theorists and vote-hungry politicians, who posed as labor protectionists, passed the Burnett bill which, after the warring European nations had taken all the foreign men who would return to their colors, drove out the Mexican trackmen who had been the salvation of southwestern railroads for ten years. Congress should repeal the illiteracy act during the present session.

All ranks of labor, whether skilled or common, all industries, as well as the cause of national defense, depend on the capacity and efficiency of the railroads. The press of the country should wake up Congress now, because the railroads and farmers of the United States need half a million men to produce and transport the necessities of life and support our army.

AVERY TURNER,
Vice-President, Panhandle and Santa Fe Railway.



General Arrangement of Camp Funston at Ft. Riley, Ken.

Railroad Efficiency at Army Encampments

Problems Arising Out of Transportation of Material,
Supplies and Men Met Successfully by the Roads

THE scope of the transportation problem resulting from the creation of large army camps throughout the country is indicated by the rapidity with which these military cities have been completed. Of the 16 cantonments constructed this summer to house the 687,000 soldiers selected for service by the draft, seven were ready to receive their entire quota of officers and enlisted men on September 5, seven others were ready to receive all the officers and two-thirds or more of their entire quota of enlisted men, and the two remaining cantonments had received and were taking care of more than their full quota of officers and were ready to receive the number of enlisted men originally ordered there on September 5.

In the construction of cantonments to date over 50,000 carloads of material have been transported to and delivered at the sites—an enormous tax upon the already overburdened railroad facilities of the country. The railroads, however, have given splendid service. As all government orders have received precedence over other traffic, the lumber and other supplies needed have been rushed to the cantonments in record time.

In the East where it has been impossible to secure sites except at a considerable distance from the railroads and labor markets, the roads have often been put to severe tests. At Camp Upton, L. I., it was necessary for the Long Island to take up rails from sidings to build the required spur tracks. At Camp Meade, Md., which is some distance from an electric road and not on any steam road, it was necessary to rebuild the electric road to make it of sufficient strength for steam transportation. In addition, the Pennsylvania has built a spur several miles in length into the cantonment site.

At Camp Grant, Rockford, Ill., it was necessary to construct 6.5 miles of side tracks in the camp and at Camp Funston, Ft. Riley, Kans., 13.5 miles. The site of Camp Dodge, 11 miles northwest of Des Moines, Iowa, is on an electric line which had 65 lb. rails and correspondingly light bridges. The latter had to be strengthened to carry small switch engines to facilitate the delivery of cars from the steam roads entering Des Moines.

In addition to serving the needs of the cantonments the railroads handled a heavy traffic to and from other encampments. The 21 regular army and national guard mobilization and training camps located in the 15 states comprising the Central War Department had 2,016 officers and 89,348 men in camp on September 5. During the ten preceding days 495 officers and 22,050 men arrived in camp, 252 officers and 12,764 men departed, and 850 carloads of materials and supplies arrived. In no instance in the handling of this traffic has there been any complaint about handling troops or freight.

In the aviation section of the Central department the camp at Mt. Clemens, Mich., received 2,329 cars of materials up to September 5; the camp at Dayton, Ohio, received 628 cars; and the camps at Rantoul, Ill., and Belleville, 1,075 cars and 1,341 cars respectively, making a total of 5,373 cars. In these instances, also, the roads met the situation efficiently and there was no delay in furnishing cars for material or delay of cars enroute.

The six cantonment camps located at Rockford, Ill.; Chillicothe, Ohio; Ft. Riley, Kans.; Battle Creek, Mich.; Louisville, Ky., and Camp Dodge, Iowa, received 11,104 cars of material up to September 5. In only one case was any complaint made as to transportation service and this was due to delays in the movement of cars from the South to Camp Custer, Mich. The matter was taken up with the general manager of the road concerned and the trouble remedied. In only two cases was there any delay in unloading, one of which occurred at Camp Custer where an accumulation of 30 cars of material for the hospital resulted when the track to the hospital site was graded. At Camp Taylor, Ky., 97 cars of lumber and 25 cars of other material were on hand at one time, but the accumulation was reduced to normal within the following two days. At Rockford, Ill., one car was recently reported delayed over 48 hours on account of refusal of the freight. At Ft. Riley no accumulation has been reported, and only a few cars have been held over three days.

These statistics bear out the statement that the railroads have succeeded admirably in their efforts to supply cars and to move them expeditiously. Camp Funston at Ft. Riley, Kans., which is a typical cantonment layout, consists of approximately 1,500 separate buildings. The camp has a complete system of water supply and sewerage disposal with more than 15 miles of piping, an electric lighting system with 250 street lamps and 20,000 incandescent lamps in the men's quarters; two fully equipped fire houses and a complete system of telephones. Each building is two stories high and houses a company of men. Every house is a complete unit, with sleeping quarters on the upper floor and a kitchen, mess hall and recreation room on the lower floor. There will be 13 heating plants, each having four 150 hp. engines and 9,106 radiators, which will require a total of 60 miles of wrought iron pipe. In addition to these large plants there will be 25 individual plants for heating officers' quarters in outlying buildings, and in such buildings as cannot be heated from these systems there will be 375 room heaters and stoves. On July 1, there was not a stick of lumber at Camp Funston. Three days later two office buildings of the Fuller Construction Company were completed and since that date 2,848 carloads of construction material have been delivered and over



General Arrangement of Camp Funston at Ft. Riley, Kan.

a thousand buildings constructed. At each cantonment up to September 1, it was necessary to complete on an average of one building per hour or, for all the cantonments, an average of one building every four minutes.

To serve this camp the Union Pacific is building a second track from Manhattan, Kans., to Junction City, a distance of 20 miles at a cost of \$1,000,000; and has already completed 13.5 miles of side tracks and running tracks to reach the various points on the reservation, new stations, freight houses, miscellaneous buildings and additional terminal and yard facilities at Junction City. The company is now handling one train of 23 coaches, carrying 1,800 laborers daily between Junction City and Camp Funston and one train of 13 coaches carrying 800 laborers between the camp and Manhattan. This latter train is expected to be increased to 20 cars and will carry 1,600 workers. The road has been compelled largely to increase its own working force and to build living quarters and restaurants for them. At the same time the company has had to mobilize passenger equipment to move 46,000 officers and enlisted men to the camp. In addition to serving Camp Funston, the Union Pacific has transported 10,000 regulars, including artillery, and the members of the officers' training camp in and out of Ft. Riley, which is adjacent.

The largest single item of construction material at Camp Funston has been lumber, which, up to September 1, had amounted to 42,000,000 ft. b. m. All the lumber for the construction of camp buildings was handled from Arkansas and Louisiana, the nails from DeKalb, Ill., the roofing paper from Minneapolis, Minn., the cement from Iola, Kans., the coal from the Missouri coal fields, the telegraph poles from Minnesota, the radiators and heating plants from Kewanee, Ill., the heating pipes from Pittsburgh, Pa., the sewer pipe from Deep Water, Mo., the machinery from Birmingham, Ala., the steel rails from Pueblo, Colo., and Joliet, Ill., and the ties from Arkansas and Louisiana. It is estimated that the average car miles of each carload of building material was 500 or a total for all freight moved of 1,500,000 car miles, approximately 50 times the distance around the world.

The following list of supplies and the amounts which the camp will require each month are as follows:

Potatoes	1,300,000 lb.	Lard	287,000 lb.
Beef	1,300,000 lb.	Butter	36,000 lb.
Flour	2,000,000 lb.	Oil	23,200 lb.
Mutton	200,000 lb.	Canned salmon	200,000 cans
Corned beef	300,000 lb.	Tomatoes	90,000 cans
Onions	375,000 lb.	Raspberry jam	36,192 cans
Prunes	53,400 lb.	Guinea	720 cans
Apples (dried)	17,800 lb.	Beans	106,900 cans
Peaches (dried)	17,800 lb.	Milk (condensed)	96,000 large cans
Coffee	99,800 lb.	Cornmeal	8,000 sacks
Sugar	320,000 lb.	Vinegar	9,000 gal.
Tea	1,900 lb.	Pickles	3,915 gal.
Pepper	3,400 lb.	Syrup	14,256 gal.
Salt	57,000 lb.		

The transportation demands of the camp have not ceased with the hauling of construction materials. The problem of moving men to and from the cantonment and delivering food, fuel and supplies will prove by no means simple. The quartermaster's department, after careful investigation, has estimated that the supplies for men and horses will require transportation for 35 lb. per capita per day. This will mean

approximately 1,600,000 lb. of supplies per day when the full quota is received. On the basis of 20 tons per car the supplies for the entire camp quota will necessitate 40 carloads per day. In addition about 500 tons of coal per day will be needed, calling for 10 more carloads.

WASHINGTON CORRESPONDENCE

WASHINGTON, D. C., September 11, 1917.

EFFECT OF WAR REVENUE BILL ON RAILWAYS

The war revenue bill, estimated to raise \$2,400,000,000 in taxes for the fiscal year ending June 30, 1918, as passed by the Senate on September 10 is more lenient with the railways in some respects than in the form in which it was reported to the Senate by the finance committee, although some roads will be hit rather hard. It is impossible to make any reasonable estimate of its effect on the roads as a whole without an application of its provisions to an analysis of the finances of each company.

All roads are affected by the increase in the income tax on corporations from 2 per cent, as provided in the present law, and from 4 per cent in the bill as reported by the committee, to 6 per cent in the bill as it was passed and sent to conference with the House. However, changes made by the Senate in the war profits tax tend to relieve a number of roads that would have been penalized, under the bill as originally proposed by the committee, for their sub-normal earnings during the pre-war period of the years 1911, 1912 and 1913.

Railroads generally would have escaped the excess profits tax as passed by the House, based on the excess over 8 per cent, but in the Senate bill the war profits tax is based on the excess of net income in the taxable year above that for the pre-war period with an exemption of at least 6 per cent but not more than 10 per cent. The rates of taxation are in a graduated scale ranging from 12 to 60 per cent of a graduated scale of percentages, ranging from 15 to 300 per cent of the difference between the pre-war income and the "war profits." The "capital," on which the exemptions are figured, as defined in the bill, does not include money or other property borrowed, nor stocks, bonds, or other assets, the income from which is not subject to the war profits tax, but includes the "actual cash paid in," the "actual cash value of property paid in other than cash for stocks and shares," and "paid in or earned surplus and undivided profits used or employed in the business." Therefore the capital on which the 6 to 10 per cent exemption is allowed is not the same as the capitalization of a road as ordinarily understood and roads which have a large proportion of their capitalization in stocks will be allowed a greater exemption than roads which have a large part of their capitalization represented by bonds.

The bill also includes a tax of 10 per cent upon the amount of net income remaining undistributed six months after the close of the year, but an exemption is allowed as to that portion of the surplus "actually invested and employed in the business or retained for employment in the reasonable

requirements of the business." It is provided, however, that if the Secretary of the Treasury finds that any portion of the surplus so retained is not reasonably required in the business a tax of 15 per cent may be levied upon it. All provisions in the bill providing for an increase in second-class mail rates were stricken out in the final vote. The bill does include a tax of 3 per cent on freight bills, to be paid by the shipper, including motor truck shipments, a tax of 1 cent for each 25 cents paid for express or parcel post shipments, and a tax of 5 per cent on passenger and sleeping car tickets.

COAL SHIPMENTS

Almost everyone in Washington having anything to do with the matter has recently been deluged with complaints of actual or threatened shortage of coal. These have received the attention of the Interstate Commerce Commission, the Commission on Car Service, the Priority Director, the Committee on Coal Production and the Fuel Administration, and in many cases the Commission on Car Service has been able to give relief by directing shipments of coal to places where it was most needed. One source of criticism has been the efforts to comply with Priority Order No. 1, directing that preference be given to coal shipments for transportation across the lakes to the Northwest. As a result of the efforts to comply with this order and to ship a little over 1,000,000 tons a week to the Northwest during the season of navigation many communities have complained that they have been discriminated against and that coal has been taken away from a community where it was needed. Meanwhile the Northwest began to complain that it was receiving a lot of slack coal which it did not want. As a result the Commission on Car Service has notified the railroads affected by Priority Order No. 1 to suspend the shipment of slack coal across the lakes. This, it is believed, will give relief to the communities where that kind of coal is needed for manufacturing and public utilities, without requiring any modification of the priority order.

Numerous requests have been addressed to the priority director for preference as to particular shipments. It is not the intention, however, to issue priority orders except in cases of broad, general importance and in any event such orders can be issued only to the railroads; individual shipments cannot be ordered to ship according to directions.

Meanwhile the fuel administrator, H. A. Garfield, is working out plans for an apportionment of the coal supply and to regulate the retail sale of coal. The fuel administrator is to choose a representative in each state and also local committees of citizens who, with the representative, will assume direction of the regulation and sale of coal in each state. Committees will also be appointed in each county and each city of over 2,500 population. The state committees will at once ascertain the amount of coal in the state available for use during the coming winter and the amount needed to meet any deficiency in the supply, based on last year's consumption. A large proportion of the coal supply available is under contracts made prior to the President's proclamation fixing the prices, and the contracts are being allowed to stand for the present but it is the intention to see that a sufficient amount is put on the market to meet the needs of domestic consumers.

Mr. Garfield has issued a statement saying that although there is a shortage of cars and of labor, by co-operation between Judge Lovett of the priority board, the Interstate Commerce Commission, and others vested with powers over transportation, cars can be had, and that he himself has power to apportion and distribute the coal.

BILL FOR GOVERNMENT PURCHASE OF CARS

Representative Bland of Indiana thinks that in order to improve the transportation system the government ought to appropriate \$100,000,000 for the purchase of freight cars

for the railroads. He has introduced a bill, H. R. 5919, for that purpose and made a speech in support of it in the House on September 8. The bill provides:

"That the President of the United States is hereby authorized to expend \$100,000,000 out of the sums heretofore or hereafter appropriated for ships, or, in his discretion, out of any money in the treasury not otherwise appropriated, for the construction or acquirement of freight cars to be used in the transportation by the railroad companies of the United States of coal and other products and commodities, pursuant to the provisions of the act entitled 'An act to amend the act to regulate commerce, as amended, and for other purposes,' approved August 10, 1917; and in the execution of this authority for the acquirement and construction of said cars the President may exercise all the powers heretofore conferred upon him by law with reference to ships. The President may direct the Interstate Commerce Commission to exercise the power hereby vested in him, or he may designate such other person or persons as he sees fit to exercise said power and authority, subject to his approval; and the cars so acquired or constructed shall be used by the railroad companies under such terms and for such compensation as may be approved by the President, and, as far as possible, under agreements providing for the purchase of such cars by the railroad companies receiving them. The President shall cause to be made public monthly information as to the number of cars acquired and constructed, the names of contractors and the terms of contracts, and the disposition of the cars; and he shall submit a detailed report to Congress at its next regular session of each and all operations and expenditures pursuant to this act."

In his speech Representative Bland said there are nine shops of consequence turning out freight cars in this country, that their capacity is about 300,000 cars a year and that at present they are turning out probably a little less than 150,000 cars a year. He thought that, for \$100,000,000, 65,000 cars could be procured and quoted a letter from the president of "one of our large railroads" suggesting that the government undertake to purchase equipment bonds from the railroads, allowing the roads themselves to make the purchase of the equipment and giving the government some control over it until the debt is paid off.

MOBILIZATION OF THE NATIONAL ARMY

The transportation of the first five per cent of the 687,000 men drafted into the National Army, from their local concentration points to the cantonment training camps, was accomplished last week without difficulty, as it involved only about 30,000 men, without their equipment. A somewhat bigger problem will be presented by the movement of the second increment of 40 per cent on September 19 and the remainder early in October, but as these men are moving from over 4,000 local points they are divided among many roads. The movement of the National Guard from their states to the 16 National Guard camps, which is now under way, requires the handling of their tents and equipment, amounting to about 12,000 freight car loads in addition to the coaches and tourist sleepers.

In the construction of the cantonments to date over 50,000 carloads of material have been transported to and delivered at the sites—a considerable tax upon the already overburdened railroad facilities of the country. The railroads, however, have given splendid service. All government orders have been given precedence and lumber and other supplies have been rushed to cantonments in record time.

In addition to the cantonment camps work has been started on the construction of two large seaboard concentration camps, each to be capable of accommodating approximately 20,000 men and consisting of 800 to 1,000 buildings. One of these is at Tenafly, N. J., in the New York harbor district and one at Newport News, on Hampton Roads.



The Large Trusses Completed

Another Large Railroad Bridge Completed

Bold Design, Involving Longest Riveted Trusses in America, Used by Chesapeake & Ohio at Sciotoville

ON July 31, the Chesapeake & Ohio commenced running trains over the new Ohio river bridge at Sciotoville, Ohio, thereby marking the completion of a structure that is distinctive because of the boldness of the design and the novelty of the erection methods which this design demanded. The river is crossed by two spans of 775 ft. each, but the superstructure of the bridge is continuous over the middle pier, thus forming one full riveted structure for the entire distance of 1,500 ft. between the end piers. This required the longest and heaviest fully riveted trusses in America. The bridge forms a most important feature of the Chesapeake & Ohio Northern, a 32-mile line extending north from Edgington, Ky., on the main line of the Chesapeake & Ohio to Waverly, Ohio. A de-

side, while at high water the river traffic shifts over to the Ohio side. These circumstances made it necessary to have two large openings for river navigation which were fixed by the war department at 750 ft. clear width, necessitating two spans of 775 ft. between centers of piers. A comparison of various designs, consisting of successive simple spans, cantilever trusses and continuous trusses, showed a decided economy for the design adopted, with the further advantage of symmetrical appearance.

The concrete piers rest on solid rock, which was encountered about 10 ft. below the mean low water level at the middle of the river. The foundation work was, therefore, relatively easy and security against settlement is assured so definitely as to eliminate positively the objection which is

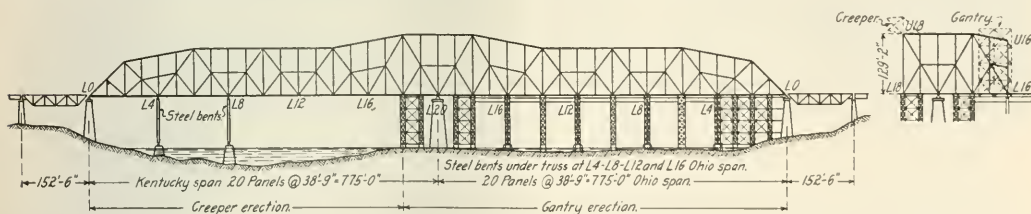


Diagram of the Trusses and Falsework

scription of this line and the reasons for its construction as a link in the route of the Chesapeake & Ohio from the coal fields of West Virginia to the Great Lakes, was given in an article in the *Railway Age Gazette* of March 3, 1916, page 397.

In addition to the river spans the bridge includes two approach viaducts, 823 ft. and 1,065 ft. long on the Ohio and Kentucky sides respectively, the former on a tangent and the latter on a 1-deg. 15-min. curve. The total length of the bridge and viaduct approaches is 3,436 ft. The viaducts consist of deck plate girder spans 67½ to 110 ft. in length, with a 152½-ft. deck truss span at each end of the bridge proper. The two river spans are complete for double track, but the steel work in the viaducts provides for single track only, although the substructure provides for the future addition of a second track.

At the site of the bridge there is a short curve in the river and at low water the channel is near the inner or Kentucky

commonly advanced against spans continuous over more than two supports.

The principal dimensions of the river crossing are as follows:

Total length, center to center of end piers.....	1,550 ft.
Length of span, center to center of piers.....	775 ft.
Clear height above low water.....	106½ ft.
Clear height above high water.....	40 ft.
Height of trusses at center pier.....	120 ft. 2 in.
Height of trusses at ends.....	77 ft. 6 in.
Width between centers of trusses.....	38 ft. 9 in.
Length of panels.....	38 ft. 9 in.

The design and details were worked out with a view to obtaining a strong, rigid structure which would meet the demands of the heaviest immediate and future traffic. The live load assumed in the design was Cooper's E-60 on each track with unit stresses that make the structure adequate for a much higher loading.

The total weight of steel in the entire structure is about 15,000 tons of which the river bridge contains 13,200 tons.

The great economy of the design, derived from the choice of continuous trusses may be judged from the fact that if the usual specifications and an independent truss system had been used, which had been the nearest in economy for the two spans of 775 ft. each, the weight of the steel would have been greater by 4,500 tons. Thus a saving of about \$400,000 was effected by getting away from routine practice.

The material is open hearth structural steel having an ultimate strength of 62,000 to 70,000 lb. per sq. in. Alloy steels at the current prices showed no economy over the carbon structural steel.

The top and bottom chord members are of a double I section, covered with a plate on top and having channel lacing on the bottom. The heaviest member was 4 ft. by 4½ ft. by 77½ ft. long, with a gross section of 596 sq. in. and weighed 114 tons. The main diagonals are also of a double I section, laced on both sides with 10-in. channels. The main center diagonals over the center pier are solid box sections, 4 ft. by 4½ ft., with a sectional area of 511 sq. in. A piece 75 ft. long weighed 83 tons. The heaviest casting weighed 22½ tons. The largest rivets were 1½

nary floor beams would not have been as rigid and would have weighed considerably more. One of the photographs shows the lower portions of one of these floor beams in the storage yard at the site of the bridge. An idea of the size is given by the two men standing in front of it. The upper portions or legs of the U were built integral with the vertical members of the trusses.

Solid plate girder portals were provided in the planes of the inclined posts at each end of the bridge and over the middle pier. Deep lattice girders were used for the trans-



Floor Beams in the Material Yard

verse bracing instead of the diagonal sway bracing ordinarily employed. One of the photographs shows the heavy portals over the center pier clearly. It also shows the upper portions of one of the U floor beams and the field splices by which they were connected to the lower part of the floor beam.

Another detail is the provision for a truss in the plane of the bottom lateral bracing to transmit the longitudinal



Heavy Portal Frames on Diagonals Over Middle Pier

in. in diameter with a grip of 7¾ in. A number of maximum-sized gusset plates were used, among the largest of which were some 15½ in. by 130 in. by 15 ft. 6 in. and others 13/16 in. by 138 in. by 17 ft. 6 in.

As most chord and web members are subjected to both tension and compression, it was decided to make them stiff throughout. All connections are riveted. No saving could have been effected by the use of eye-bars for the few members taking tension only. Pin connections were thus avoided and for members subject to a reversal of stress, riveted connections secure the greatest possible rigidity. All joints of members, whether in tension or compression, were fully spliced. The center bearing of each truss on the center pier carries a dead load of nearly 5,000 tons and a live load of 3,000 tons.

UNIQUE DETAILS OF THE DESIGN

A number of details of the design are unique and were adopted primarily to increase the rigidity of the structure. The floor beams consist of continuous U-frames, the vertical portions of which extend up to the bottom of the sway-bracing. On account of the shallow depth available, ordi-



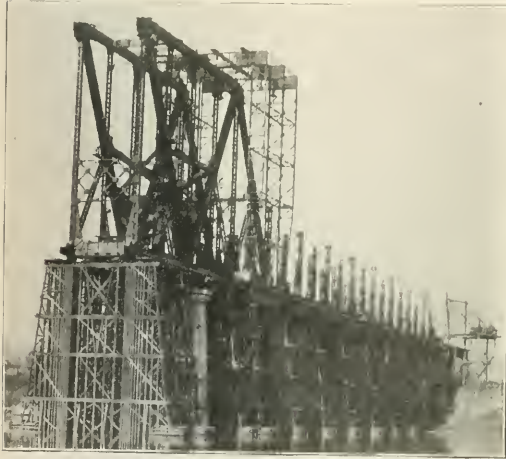
The Falsework Did Not Obstruct the Flow

forces from traction and braking directly to the trusses without bending the floor beams. No expansion joints are provided in the floor system.

INGENIOUS ERECTION PLAN

The Ohio span of the bridge was erected on falsework, while the Kentucky span which had to be maintained open

for river traffic was erected by cantilevering out from the middle pier. However, to avoid provision in the design for the cantilevering of the entire distance, temporary steel bents on concrete pedestals were provided in the channel on the Kentucky side at panel points 8 and 4 as shown in the diagram. In general the erection plan was such as to secure at least a certain measure of balance over the center pier between the two halves of the bridge and thus relieve



Commencing the Erection of Trusses on the Ohio Side with the Gantry

the falsework of a large part of the dead weight of the bridge.

The falsework was unusual in character. At the main triangle points, L-4, L-8, L-12 and L-16 on the Ohio side, the trusses were supported on steel columns 100 ft. high, resting on concrete pedestals similar to the two intermediate supports provided on the Kentucky side. The bents formed by these columns were enclosed by towers consisting of two frame bents of 29 posts each, supported on the river bot-

tom, leaving only the steel posts under the main triangle points. As shown in one of the photographs this type of falsework offers a minimum obstruction to the stream flow.

As stated previously the approaches to the bridge are equipped with a superstructure for single track only, but to facilitate the handling of the erection equipment on both tracks of the main structure the 152½-ft. deck truss span for the Kentucky side was first erected temporarily along side the duplicate span for the Ohio side. This afforded a double track directly over the material yard, which was located alongside the main line of the Norfolk & Western on the Ohio bank of the river. The transfer of materials from the yard to the bridge deck was aided materially by this arrangement and was accomplished by a stiff leg derrick set on a steel tower, located alongside of the yard tracks.

Three types of erection equipment were used in assembling the spans. The falsework girders, floor system, bottom chords and the lower sections of the vertical posts on the Ohio side were erected by a bridge derrick car. The trusses were completed in this span by a steel gantry 160 ft. high standing astride of the structure on tracks provided for it on the falsework outside of the trusses. This same gantry had been used previously by the contractor to erect the inverted bow-string trusses of the Little Hell Gate spans on the New York Connecting Railway. For the cantilever erection of the Kentucky span, a creeper traveler which moved on the top chords of the structure was used.

ERECTION INVOLVED HEAVY JACKING OPERATIONS

The erection of the trusses on the Ohio and Kentucky sides proceeded simultaneously towards the two ends of the structure, the progress on the Ohio side being sufficiently in advance of that on the Kentucky side to maintain an adequate condition of overbalance toward the side supported on falsework.

In consequence of the condition of cantilever over the center pier, the ends of the partly-erected trusses deflected downward below the normal position of the completed structure. As the steel work on the Ohio side was completed as far as each of the steel falsework bents in turn, powerful jacks at the tops of these bents were used to lift the trusses and thereby partially correct this deflection. This



Ohio Span Completed, Kentucky Span Advanced by the Creeper Traveler While Carried on Two Temporary Bents

tom. These towers and similar ones at the intermediate panel points half way between them served as temporary supports for the deck girder spans ordered for the viaduct approaches. These girder spans served to carry the bridge floor and the track for the erection equipment. They also supported the bottom chords of the trusses until the latter were assembled, but as soon as the trusses on the Ohio side were completed the girders and timber falsework were re-

moved, leaving only the steel posts under the main triangle points. As shown in one of the photographs this type of falsework offers a minimum obstruction to the stream flow. When the trusses were completed to the Ohio side, the end bearings were about 8 in. low and upon jacking these up sufficiently to place the 16-in. roller bearings, the load was

released entirely from the falsework in the Ohio channel.

Similarly when the erection on the Kentucky side had progressed to the two intermediate supports and finally to the Kentucky pier, jacks were used in turn to reduce the deflections and take portions of the load at those points. The end of the span on the Kentucky side was about 16 in. low and required a jacking load of about 2,340,000 lb. to lift the span the required amount. The jacking loads on the intermediate supports varied from 400,000 lb. to 1,926,000 lb.

Because of the rigid gusset plate connections, secondary stresses received special investigation in the design, but one of the most interesting features of the erection was the means taken to reduce the secondary stresses arising from the distortion of the riveted joints through deflection under load. To overcome this the members were laid out to fit the true shape of the trusses as deflected under their own weight and one-half of the assumed live load so that each member would then be in a straight line condition. Because of this no joint could be assembled under the erection conditions without forcing the member into its proper position. In some cases this was accomplished by a line from



Creeper Traveler Standing on the Completed Kentucky Span

the erection equipment; in others special jacking rigs were necessary. The workmanship was excellent, the connections came together accurately and true without delay and to this may be ascribed the fact that no mishap of any kind took place during the progress of the work.

The location and construction of the Chesapeake & Ohio Northern including the Ohio river bridge were under the general supervision of M. J. Caples, vice-president of the Chesapeake & Ohio. The design and detail plans of the bridge and approaches were worked out by Gustav Lindenthal, consulting engineer, New York City, who also was in charge of the execution of the work. The substructure was built by the Dravo Contracting Company of Pittsburgh and the fabrication and erection of the steel superstructure by the McClintick Marshall Construction Company, also of Pittsburgh. The work on the foundation was started in November, 1914, and the bridge was completed and opened to traffic on July 31, 1917.

THE INFLUENCE OF HYDRATED LIME

A little over a year ago when the structures on the new Indianapolis & Frankfort Railroad extending from Ber Davis to Frankfort, Ind., were being designed by the Vandalia, the value of hydrated lime as an ingredient in the concrete was seriously considered with respect to its effect in producing greater plasticity and freedom of flow. It was decided to give it a thorough trial to demonstrate its effectiveness and economy. Over the entire distance of the new road, 41 miles, there is a total of 42 bridges of various types, each containing from 300 to 1,500 cu. yd. of concrete. The contractors, Dunn & McCarthy Company, Chicago, up to this time had placed all of the concrete by means of a tower. It is interesting to note here that about ten of the bridges are located at public highways when a good supply of water could not be obtained except at considerable expense.

The quantity of hydrated lime specified to be used was 10 per cent by weight of the cement content for each batch of concrete. To make the method of incorporating it as convenient as possible a box about 3 ft. square and 2 ft. 6 in. deep was kept alongside the mixer with sufficient hydrate in the box to meet immediate needs. As the proportions of cement, sand and gravel for a three-bag batch were placed in the loading hopper, two 12-qt. pailfuls of lime were placed in the hopper on top of the dry materials. This mixture was then emptied into the mixing drum and mixed in the usual manner.

The first fact noticeable from the use of hydrated lime was that the mixture flowed much more freely through the chutes, and this was accomplished with the use of considerably less water than is ordinarily required. In view of the present agitation to avoid an excess of water in concrete, the fact that the use of lime made it possible to reduce the quantity of water was recognized as a factor that would tend to increase the strength of the concrete.

The next noticeable effect was after the concrete mixture had been deposited in the forms. The increased plasticity which has been introduced into the mixture by the lime with less water was found to permit the concrete to be placed properly with a less amount of spading than that ordinarily required. Some of the flat top subways had complicated skew spans with corners that it was impossible to reach with a spade. The lime proved very successful in such places, as can be seen by the hardened concrete, preventing honeycombing and producing a smooth, uniform surface. The easier working of the concrete also resulted in a saving of about 50 per cent in the spading. The labor saved in cases where it was necessary to move the concrete some distance in the forms from the place where it had been deposited amounted to about 40 per cent.

Another noticeable effect of the lime was apparent upon removing the forms when it was found that it had been effective in eliminating segregation as was seen by the appearance of the surface, which was smooth and even and in which honeycombs and stone pockets were conspicuous by their absence. No extra labor after removing the forms was necessary for patching. The results where watertight concrete was desired have also been satisfactory.

At the time of beginning this construction an order for 280 tons of hydrated lime was placed to be shipped as desired by the engineer in charge. After noticing the effect on the chuting and spading of the concrete, the lesser amount of water required, the labor saved, and the appearance of the finished concrete, it was decided to use lime in other parts of the structures where it had not been specified originally, involving an additional purchase of 300 tons. It is stated that the cost of the 580 tons of hydrated lime used has been largely compensated by the labor saved. The work was under the direction of F. T. Hatch, chief engineer, and H. T. Whitney, engineer in charge.

Practical Ways of Increasing Train Loading*

Several Railway Men Point Out Simple Methods by Which the Economy of Operation May be Promoted

IN view of the increasing importance of the subject of train loading at the present time the articles which follow, which were received in the contest on Increasing the Train Load, are of particular interest. Fortunately the ability to increase the train load is not dependent solely on large expenditures for the reduction of grades and for the installation of more powerful locomotives, for some of the greatest improvements in this respect have been made without these expenditures, but primarily by the exercise of increased supervision and the adoption of simple methods within the reach of every railway.

MAKE THE DESPATCHER RESPONSIBLE

By T. H. Williams

Division Superintendent, Southern Pacific, Oakland Pier, Cal.

The train loading problem should be assigned to the chief despatcher, because he directs the movement of the crews and power, and owing to his knowledge of the schedules he is in a better position than any other officer on the division to know the tonnage that can be moved successfully and still maintain train schedules on various assigned and extra trains. In laying out a campaign of train loading all staff officers on each division should be made to understand that this work will be directed by the chief despatcher and that it is necessary that he be given the co-operation and assistance of the staff in order to accomplish the desired results. Where the responsibility is not placed upon the shoulders of the chief despatcher, but it divided among several officers, a situation is created which in the end will mean the disorganization of schedules.

On a heavy operating division where a large volume of carload traffic originates and particularly in territory where there is keen competition, it is necessary for all officers, both mechanical and operating, to give this subject daily attention in order to produce results. A system of statements is necessary in order that each officer may know the following day, and at the end of each week, the number of through trains moved in the direction of the preponderance of business, and the average tons hauled per engine. These statements may be obtained from the train sheets readily. On this division this is placed before each officer in the following form:

MOVEMENT OF THROUGH TRAINS AND CARS, FEBRUARY 28, 1917 (WESTWARD)

Between—	Trains	Loads	Empties	Average tons
Oakland and Sacramento	1	44	8	2,195
Oakland and Tracy (via Martinez) ..	2	76	26	2,070
Oakland and San Jose	1	40	8	2,003
Redwood and Tracy	5	194	7	1,775
Redwood and Oakland	3	72	92	1,700
Oakland and Port Costa	1	45	3	2,342
Total	13	471	144	2,181

In addition to the daily record this information is kept by the chief despatcher in book form; it requires very little time on the part of the despatcher or his forces to take it from the train sheets. By posting on the first of each month the record by days made during the previous year we are able to know our standing from day to day as compared with last year. This company furnishes its officers promptly adequate statistics to show train and engine loading, and train and car miles, but the operating officer should not wait for the auditor's figures to enable him to analyze the results. The daily and weekly statements as kept by the chief despatcher are found to harmonize and compare with the auditor's reports, as the auditor's reports are taken from the conductors' wheel reports, and the tonnage on the train sheets

is wired in the consist of the trains by the conductor to the chief despatcher, therefore we have an absolute check on the amount of tonnage handled.

On a large system, where there are many divisions involved, it is the writer's opinion that the divisions should be ranked in statement form according to the increases or decreases in engine load, and that this should be sent to the division superintendents each month, ranking the divisions in the order in which they stand, according to the percentage of their increase this year over last. This will necessarily produce a spirit of rivalry among the various divisions involved.

The following statement gives a reflection of the results that can be obtained in decreasing the train and locomotive miles by increasing the engine load, and in view of the fact that train and engine men are paid principally on a mileage basis, the decrease in mileage in the face of an increase in business, necessarily means greater net revenue. Train and engine loading accomplished, however, through tying up crews short of destination because of the sixteen-hour law, through the use of a large number of relief crews, and through the payment of excessive overtime, is not producing the results that increasing the train load should accomplish:

STATEMENT OF GROSS TONS MOVED ONE MILE ON THE MAIN LINE (THOUSANDS), IN THE DIRECTION OF THE PREPONDERANCE OF BUSINESS; AVERAGE ENGINE LOAD: TRAIN AND LOCOMOTIVE MILES—FOR SIX MONTH PERIOD, JULY TO DECEMBER, 1916, WITH COMPARISON FOR THE SAME PERIOD OF 1915

Month—	Gross tons one mile (Thousands)		Average tons per locomotive		Train miles		Locomotive miles	
	1916	1915	1916	1915	1916	1915	1916	1915
July	45,318	39,735	1,082	1,093	34,204	31,292	41,877	36,355
August	49,558	43,939	1,165	1,053	34,179	35,287	42,555	41,711
September	51,221	46,110	1,202	1,062	34,819	36,180	42,613	43,434
October	48,665	48,151	1,156	1,070	34,331	37,193	42,099	43,000
November	45,272	41,839	1,281	1,032	29,294	34,108	35,353	40,547
December	43,233	38,833	1,309	1,099	27,391	29,530	33,036	35,328
Total	283,267	258,607	1,199	1,068	194,218	203,599	237,533	242,365
Incr. or Dec.	24,660				9,381		4,832	
Per cent Incr. or Dec.	9.5				4.6		2.0	

An increase of 9½ per cent in gross tons moved was accomplished with a decrease of 14,213 train and engine miles, by reason of the increase of 131 tons per locomotive.

For traffic reasons, pressure is often brought to bear to install additional train service, and in many cases this demand is for fast service that means light trains in order to accomplish an "on time" record. These demands are usually made to afford a quicker despatch of the freight involved, making earlier delivery in various cities, which business prior to the installation of the fast service was moving on regular trains. In the end this serves to increase train and engine mileage and is a material factor in decreasing the average train load. Demands of this character are discouraging features which operating officers meet in their endeavor to increase the train load. It is admitted, however, that requests for additional service are frequently far-reaching. It may mean the controlling of a large volume of through business that might be divided or thrown to the rails of a competitor.

"BUY A CARLOAD"

By E. H. Shaughnessy

Trainmaster, Chicago & North Western, Chicago, Ill.

There is one way to increase the train load without spending a lot of money for grade reduction, larger locomotives and increased facilities, all of which are a part of every railroad's future plans. That is, to increase the load in the car. Locomotives are (or should be) rated to haul tonnage based on the maximum theoretical tractive force. If it were pos-

*Other papers received in this contest were published in the issues of June 22, page 1401; July 13, page 63; August 3, page 201; and August 24, page 347.

sible to put the designated tonnage in one car, the efficiency of the locomotive could be fully utilized the year 'round in hauling real tonnage and a trifle less than 100 per cent utility obtained. The necessity for spreading the lading among a number of cars brings into play the factors of atmospheric resistance, wheel friction, slack action, etc., which do not decrease the efficiency of the locomotive in itself but waste it so that the utility is materially decreased.

The necessity for heavily loaded cars is therefore of the greatest importance, so that trains can be shortened in length without loss of tonnage. Especially is this true on most railroads where the practice is to run mixed trains of loads and empties, governed by more or less scientifically compiled, equated tonnage ratings, which automatically reduce the actual tonnage hauled as the length of the train is increased.

To those who have in any way analyzed the loading of freight it must be apparent that the railroads do not get anywhere near the capacity (meaning 10 per cent or 15 per cent above the marked capacity) in the cars loaded. This is notoriously true in connection with closed cars loaded with manufactured commodities which are so bulky that it is not possible to load to capacity, and surprisingly so in connection with both closed and open cars loaded with commodities wherein it is possible to load to capacity, but which are not so loaded.

It follows, therefore, that without additional expense and without waiting for much needed improvements, the trainload can be increased if the carload is increased. In my opinion the best angle of approach in solving the problem is through the buyer of the commodities. Much can be done with the shipper and a great deal has already been done. In fact it would seem that the efforts put forth to increase the carload have been directed almost exclusively toward the man who loads the cars, whereas the fellow who unloads them holds the key to the situation.

In every village there are one or more merchants who buy coal, coke, brick, lumber, tile, sand, gravel, etc., in sufficiently large quantities so that a car is used in filling the order, and these orders are repeated from time to time depending on the amount of business done. Investigation will show that a very large number of these merchants order a specific quantity of each of the different articles sold by them. When queried as to why this method is followed, the merchant generally has no very good reason to offer. Sometimes the question of storage room enters into it, but as a rule it is simply a habit formed years ago when the cars were smaller, and the situation relating to cars entirely different.

Bearing in mind that these car-at-a-time merchants handle the bulk of the real revenue producing business on most railroads, the thing to do is to get them to "BUY A CARLOAD." That should be the slogan for every railway department from top to bottom. What shipper can consistently refrain from loading a car to its full capacity in space or weight, if he has orders to that effect from the people who are buying his materials?

Good results can be obtained right from the start in a "BUY A CARLOAD" campaign even on a single division. The increase in the train load on that particular division may not be noticeable to the eye, but it is there nevertheless. If this item were given the attention it really deserves on all divisions of all railroads along the lines suggested, a very decided step toward increasing the train load would have been taken without costing a cent.

It is simply a matter of education. The small town merchant is easily approached, deeply interested in railroad problems (more so than is generally thought to be the case), and if appealed to tactfully, co-operative in the greatest degree. All that is necessary is to enthrone him with the railroad viewpoint and he will "BUY A CARLOAD" every time, and

the rest is easy. Any good operating man can increase the train load if he has the increased carloads to do it with.

BETTER STATISTICS NEEDED

By Mark H. Reasoner

American railroad men, and especially those in charge of operating trains, have in late years been divided by a distinct line of cleavage into two groups; they are either low tonnage or high tonnage men and they have been encouraged by the tendency of the higher officers to endorse one or the other of these policies. By far the greater number have believed in high tonnage, so much so that it has become an established practice upon the majority of roads.

Probably most large terminals are inefficiently operated because of the lack of the information and supervision which form the essence of operation; with such an organization a complete scheme of classification may be worked so that properly loaded cars may be selected and switched into trains for preference destinations and thus handled with decreased cost and increased efficiency.

A trainmaster should devote a large share of his time to watching the handling of tonnage trains. Trainmasters too often fall into the habit of attending to matters which do not concern them, instead of those duties which rightfully should claim their attention. A trainmaster should be what his title implies, a master of trains.

The fact that the greatest difficulty of our present system of operating statistics is that they generally become ancient history and records of past performances so old that they are useless for practical purposes of operation has been one of the greatest hindrances to operating men. The imperative need for a statistical system which will give a prompt, accurate and comprehensive history of each operating division is apparent. Proper, prompt, intelligent and adequate supervision is only possible through these channels and they should present knowledge of conditions which any management can act upon with a reasonable degree of promptness.

Such statistics should take form in performance statements concerning main line movements and it is important that the proper relation between the value of the locomotive and the tonnage which it hauls be maintained and made a matter of daily inspection by the operating officer in charge. Such reports can be compiled readily in the transportation offices and finally completed by the statistical divisions in time to be of practical value. Roads using the Hollerith system of assembling statistics are in an especially fortunate position as regards speedy delivery of such figures. These figures should be based primarily on the expenses of road engineers, trainmen and fuel in freight service only and should be separated as between tonnage and way freights. This will, of course, reduce matters to the common denominator of railway cost, the ton mile.

THE MECHANICAL DEPARTMENT A FACTOR IN TRAIN LOADING

By T. T. Ryan

Division Foreman, Atchison, Topeka & Santa Fe, Las Vegas, N. M.

The principal thing that operating officers can do to increase tonnage on single track roads is to so despatch that the freight trains will have the open door and then keep them moving. Engines and cars with bearings warmed up and lubricated will run free and pull easily, while if the same equipment is run in and out of a dozen side tracks over the division it will pull vastly harder and the cost of operation will increase. Also by their tact and methods of approach operating officers can create an esprit de corps that will automatically increase tonnage. The chief factor in increasing tonnage does not lie with the trainmaster, but with the master mechanic; we can trust the trainmaster to "hang 'em on" if

we are ready to "pull 'em." There are many ways to increase the efficiency of the engines. The boilers should be kept scrupulously clean and free from scale. The effect of dirty boilers and the action of scale as a non-conductor should be explained to the men. Next see that fireboxes, flues and front ends are kept free from leaks so that the draft will be unimpeded. This seems like unnecessary advice, but an examination of the 70,000 engines in the United States will disclose that it is needed.

If these things are done we will have free steaming engines. This in turn means that an engineer knows when he gets the "gate open" he can go; you cannot expect an engineer to watch a falling pointer and at the same time try to handle tonnage. The good effect of these features will be largely minimized if coal is not properly selected and sized, for there are few things more discouraging to engineers than poor coal and to shop men than engines which do not steam owing to irregularity in the quality of coal. Both are expensive to the railway.

If these and the minor things about the engines are done and done well when they should be, the engines in their turn will pull the maximum rating and do it every day. Then if the despatcher will use the zeal he should in getting men over the road and encourage them to make a good run instead of a poor run we will increase our tonnage 20 per cent without a dollar of capital outlay.

This does not, however, mean that we should not modernize old engines. First in this line come brick arches. The application of arches to all the old power would mean the equivalent of 4,000 engines added. The application of superheaters to engines not yet superheated means the equivalent of 20,000 more engines.

Did we ever hear the best engineer on our territory say the train he had last trip pulled like two trains and he could not get it going? What was the reason? Friction of course, caused by brakes sticking owing to foundation gear binding, too little shoe clearance, and dry bearings with improper area. What is the remedy? Inspect the gear and know it is right and kept so. Inspectors are supposed to get cars through the terminals with a test of about a minute per car; they get them through all right, but the road pays for it in loss of tons and in excess of coal consumption and overtime. The remedy is to see that the car is right from point of origin to destination.

LOADING CARS INTELLIGENTLY

By H. F. Reddig

Division Superintendent, Chicago, Rock Island & Pacific,
El Reno, Okla.

To increase the revenue tons per freight train mile where no reduction is to be made in the grade line or in the increased capacity of motive power or equipment it is necessary either to increase the gross tons handled per train or the net tons by decreasing the number of tons of tare weight hauled per train mile. On most railroads the locomotives now have a tonnage rating up to their maximum capacity. To increase the revenue tons per freight train mile it is necessary to decrease the tare tonnage.

To do this one must commence with the car, and load it to the maximum or visible capacity. Apply proper equipment for loading—where one can get cars loaded to their maximum capacity, equipment of the largest capacity should be applied. The proportion of tare weight to capacity decreases with the increased loading capacity of equipment, so that by not supplying equipment of larger capacity than necessary for the load, the tare weight can be decreased. There is a difference of from four to six tons in the tare weight of 60,000, 80,000 and 100,000 lb. capacity cars.

After the loading of the cars comes the elimination of empty car mileage. The distribution of equipment should

be studied so as to load equipment into such territory that it can be given a load out without unnecessary empty mileage. Difficulty is experienced by all lines in loading flat, coal, automobile, stock and refrigerator cars, especially the packers' cars, in the direction opposite to that in which the car moves when under load with the commodities usually handled. A careful study will enable most of this equipment to be loaded at least part way in the direction in which these cars ordinarily move empty.

The heaviest power available should be used on all runs to increase the gross tonnage per train. Engines should be tested over each entire engine district to ascertain the maximum tonnage they will handle between different stations. Cars for intermediate stations should be handled on local trains. Through trains in the direction of the heaviest traffic should be kept under full load. In many instances fast freight trains are run with decreased tonnage in order to overcome operating conditions that can be eliminated with little difficulty.

By keeping fast freight trains moving it is seldom that schedules cannot be maintained and at the same time handle the maximum tonnage rating. Local freight train runs should be of such distances that they can either handle a maximum loading out of the initial terminal or into the final terminal.

A "follow-up" campaign is necessary to get agents to see that all cars are loaded properly and to report promptly any car leaving or arriving at their stations not properly loaded. Weigh masters, bill clerks at terminals, yard masters and conductors should all be kept interested and should call attention to cars not properly loaded or cars moving empty that might be given loading. The chief despatcher and car distributor should keep a close check on empty cars moving, which information can be gotten from the train consists, and get these empty cars to points where they can be given load. The tonnage clerk must check the wheel reports closely and call attention to lightly loaded cars and cars moving empty that could have been given loading.

PROGRESS IN ACCIDENT PREVENTION*

By Marcus A. Dow

General Safety Agent, New York Central Lines.

It is but a little more than ten years since the United States Steel Corporation began its systematic accident prevention work and planted the seed which has brought forth a product of such great value to humanity that its development has been one of the biggest things in the history of American industry. Those pioneers who first promoted accident prevention work entered a strange and unexplored country. Their only compass was a vision—a vision of a better state of affairs wherein cripples and widows and fatherless children were to be no longer a by-product of industry.

There are no reliable statistics of accidents occurring in the United States as a whole; but estimates give conclusive proof that the waste of human material due to preventable accidents each year is nothing short of appalling. Dr. Frederick L. Hoffmann, statistician of the Prudential Insurance Company of America, estimates that in 1916 there were approximately 22,000 persons killed in industrial accidents and that at least half a million were so seriously injured that they lost more than four weeks from work. The lives of 220,000 industrial workers were snuffed out in 10 years! The hospital cots of those seriously injured in the ten years would cover a single track railroad from New York to San Francisco and back again.

* * * There have been some few employers who have not acquired great success because, even though they pretended to

*From an address delivered at the congress of the National Safety Council, New York, September 12.

inaugurate accident prevention work in their plants, they were not good safety men at heart. Successful safety work is not based on pretense. There have been those who believed that all that was necessary for them to do was to post a few safety bulletins in their plants and let it go at that. The spirit of safety did not pervade their establishments because they were not good leaders and did not make their employees feel that they were sincere. Experience has proved that success in safety springs from a service of the heart, and an ability and determination to concentrate every energy, every resource necessary, upon the obtaining of results. The spirit and the attitude of any employer—of any railroad officer—will be reflected in every corner of his plant and on every mile of his road. If he is a safety man at heart accidents are reduced—the majority of his employees are co-operating with him to that end—and yet his plant is working on the highest plane of productive efficiency. There has, perhaps, been no greater benefit derived from accident prevention work than through the getting together of employer and employee in intimate conferences in regard to a matter of common interest and concern.

Operating officers, with their manifold duties, cannot keep continually developing new ideas in accident prevention, and the safety engineer has become almost indispensable. Experience has shown his territory should be confined to an area which will permit him to come into frequent personal contact with a majority of the employees under his jurisdiction.

The New York Central Lines originally employed in their safety bureau several safety agents who covered a wide territory where close supervision and frequent contact with the men was impossible. A year ago we tried as an experiment the employment of a few division safety agents on certain main line divisions. After several months' trial it was found that the accident record on these divisions, compared with the same months the previous year, was from 20 per cent to 35 per cent lower than it was on similar divisions where there were no division safety agents. Therefore, commencing the first of July this year, the New York Central Lines took a new step in safety progress by appointing division safety agents on all of the main-line divisions of the system.

There is perhaps a no more striking example of what consistent safety work will accomplish than the record that has been made by the railroads of the United States in the past few years—a record that has been made in spite of increased traffic, labor disturbances, and numerous other intense operating conditions. On all the railroads of the country, during the seven years ended June 30, 1916, there has been a steady decrease in the number of railroad employees killed and injured while on duty. In the year 1910, on all of the railroads, 2,17 employees were killed out of every thousand men employed, while in 1916, only 1.17 were killed out of each thousand employed—a decrease of 47 per cent in the number of employees killed per thousand employed. In 1910, 47.1 employees were injured per thousand employed on the railroads, while in 1916, only 25.2 were injured per thousand employed, a decrease of 46 per cent. Pride in the accomplishment of those who have worked with me on the railroad I have the honor to represent prompts me to tell you that on the New York Central Railroad in the year 1916, as compared with 1913, there was a decrease of 35 per cent in the number of employees killed per million tons freight carried one mile, and of 20 per cent in the number injured. Actually, in the three years ended December 31, 1916, on this road 284 employees were saved from fatal injury and 6,211 from non-fatal injury, using the rate for 1913 as a basis for comparison. The Chicago & North Western, the first railroad to inaugurate a safety campaign, in 6½ years has saved the lives of 293 of its employees, through the humanitarian work of that grand old safety pioneer, Ralph C. Richards.

The record of the United States Steel Corporation stands

out like a beacon light. In the nine years ended 1915, its safety work has saved 14,967 of its employees from death or serious injury, the injury rate for 1906 being used as a basis for comparison. The long list of industrial concerns, with similar records of achievement, should have their names emblazoned on a roll of honor that would inspire and enlighten the world. There is the E. I. Dupont De Nemours Company, the Eastman Kodak Company, the American Smelting & Refining Company, Cadillac Motor, Commonwealth Edison, Commonwealth Steel, Corn Products Refining Company, Fairbanks-Morse, Harrison Brothers & Company, Illinois Steel Company, Inland Steel, International Harvester, Milwaukee Coke & Gas, Neenah Paper, Packard Motor Car, Pullman Company, and the Rochester Railway & Light Company. [These show reductions from 24 per cent to 88 per cent in the percentage of casualties to number of employees.]

Even to-day, with our country at war, must the cause of safety be upheld and its progress continued. I have no sympathy with the thought that because lives are necessarily sacrificed for a righteous cause on the battle front other lives must be unnecessarily sacrificed at home through neglect. Surely, the killing of 22,000 and the injuring of half a million industrial workers a year is a serious drain on the manpower of the nation at a time when every available man is needed for the work that is to be done. Our duty is clear. We must keep the workmen inspired. We must keep the machines going; keep the wheels moving; keep the industries up to their highest point of productive efficiency; keep from having accidents, or anything else that will lessen that efficiency.

So much for the progress of accident prevention. What of the future? There may be a temporary backward swing of the pendulum. Accidents this year are increasing, even where the best of records have been made in the past. This is but the natural result of the high tension under which industries and the railroads are now operating, many at double their usual capacity. This, together with greatly increased labor turn-over and similar influences due to the war, is affecting the accident record adversely. But this only emphasizes the need for greater effort and increased safety activity. As to the future, I believe that somewhere within, say, 10 years, the time will come when a workman who is employed will not only be expected to know how to operate a particular machine, but that his continuance in the employment will depend upon his observance of reasonably safe practices. When a workman is employed he will be examined, not only as to his physical fitness, but as to his personal habits and as to his attitude toward accident prevention. Systematic instruction of the workman as to how to do his work with the least possible risk of injury to himself and others will be an obligation firmly fixed on the shoulder of the employer, and the competence of a foreman will be measured in part by his ability to enforce safe practices on the part of his men. I believe that the time is not far distant when the great majority of American workmen will refuse to permit a man to work in their midst who is habitually careless. The drawings and specifications for every new building, whether it be for an industry, a church or a home, will be carefully scrutinized by safety engineers to make sure that every known precaution has been observed. I expect the day to come when the safety engineer, or safety agent, will be a permanent and fixed member of the official staff of every industrial plant and of every operating division of every railroad in the land. Every village, town and city will have an organized department to protect citizens from injury by accident. I believe, too, that the subject of accident prevention will become a part of the curriculum of colleges and technical schools, and that the degree of safety engineer will be as coveted as that of physician or doctor of laws. The children in the public schools will be taught safe habits. * * *

SALVAGING ROLLING STOCK ON THE SANTA FE

Washouts in January, 1916, completely isolated a portion of the 15-mile branch of the Atchison, Topeka & Santa Fe between Fallbrook, Calif., and Fallbrook Junction and marooned equipment valued at \$50,000. This line, which lay in the Temecula canyon, had been subject to repeated floods in the past, and for that reason, it was decided to re-build on higher ground. When the new branch was completed, it had no connection whatever with the old line and terminated in the town of Fallbrook, 377 ft. higher and $1\frac{1}{2}$ miles south of the old station in the canyon where the



Moving Cars up a 10 Per Cent Grade

rolling stock was situated. The unusual difficulties in the way of salvaging this equipment and the manner in which they were overcome are outlined in an article in the Santa Fe Magazine by J. P. O'Shea, inspector of the Santa Fe Lines at San Bernardino, Calif.

The equipment consisted of an 80-ton, 2-8-0 type locomotive, four refrigerator cars, two passenger coaches, two flat cars (one loaded with a 36-ton turntable), one tank car and one box car—in all, a train weighing 400 tons, including loads. Among the factors which complicated the problem of moving the equipment were the complete isolation of the old



The Equipment 335 ft. Above and 4,500 ft. Distant from Starting Point.

line, the elevation of the new line above the old, the distance between the two, and the rugged character of the intervening country. It was finally decided to move the train over a temporary track on an abandoned wagon road between the two lines. This highway had a maximum grade of 14 per cent, with curves varying from 15 to 50 deg., and for three-quarters of a mile it followed the side of a canyon, where any carelessness would have junked the rolling stock. The fact that the train weighed 400 tons and that it was planned

to raise it 436 ft. within a distance of 6,300 ft. caused four surety companies to refuse to bond the work. However, the contract for the salvaging was finally awarded to a firm of house-movers in Pasadena, who began operations on March 14, 1917, with a force of five men, four horses and "the usual outfit of the house mover—capstans, cables, chains and cussin'." Less than three months later, i.e., on June 10, 1917, the work was completed and the equipment was transferred from Fallbrook to the main line at Oceanside.

To safeguard the rolling stock on the unusual grades, ties were wired behind each pair of trucks and 12-in. by 12-in. chocks were carried behind each set of drivers on the engine. The equipment was chained to the track when not in motion and the rails were removed behind the engine, which had been switched to the back end of the train before work began. The capstans used had a 10-in. spool (well casing) and a "sweep" of 108 in. By using $\frac{1}{2}$ -in. cable, $\frac{3}{4}$ and 1-in. chains, and six single sheave blocks, this arrangement enabled four horses to pull the 80-ton locomotive on a 14 per cent grade. On lighter grades two cars were moved by the same method at an average speed of six feet a minute; on grades under 10 per cent two horses easily pulled loads up to 50 tons.

The engine was stripped to a 15-ft. rigid wheel base, so that it could be drawn around a 50-deg. curve without de-



Locomotive on an 11 Per Cent Grade

railing. It was also necessary to grease the inner rail on curves to keep the locomotive on the track and to maintain a maximum super-elevation at those points below 4 in. to prevent the rails from overturning.

Floods have repeatedly damaged the Fallbrook branch and especially that part of it which originally extended to Temecula, about eight miles northeast of Fallbrook. This section, which formed part of a through route from San Diego to trans-continental connections at San Bernardino, was destroyed by washouts in 1884 and again in 1891. It was rebuilt the first time but not the second, and the remaining portion of the line from Fallbrook to Oceanside, 20 miles, was acquired by the Santa Fe in 1906. San Diego commercial interests, which desired direct connections with the Santa Fe line to the East, agitated persistently for the reconstruction of the Fallbrook-Temecula link. Finally, in 1916, the Railroad Commission of California ordered the Santa Fe to rebuild and restore to operation a line from Fallbrook to Temecula, or to construct an alternative line from the latter point through Rainbow Valley to Oceanside, although it was shown that the potential traffic would not justify the heavy expenditures which the work would necessitate. The case was later taken into the courts by the railroad, where the decision of the California commissioners was overruled.

ACCIDENT BULLETIN NO. 62

The Interstate Commerce Commission has issued its accident bulletin No. 62 containing a record of railway accidents in the United States during October, November and December and during the calendar year 1916, which, under the commission's order, is now the fiscal year for reporting all railway statistics. Comparisons are shown with the last two twelve-month periods ending June 30. The annual summary shows that the total number of casualties to persons for the year was 206,723. The figures for the year are summarized in Table 1 as follows:

TABLE NO. 1.—Casualties to persons year ended December 31

Class	Passengers		Employees		Other persons		Total	
	Kil'd	Inj'd	Kil'd	Inj'd	Kil'd	Inj'd	Kil'd	Inj'd
Collisions.....	70	1,886	179	2,013	17	46	266	3,945
Deraillments.....	41	1,699	156	1,279	61	155	258	3,133
Miscellaneous train accidents.....	66	35	530	3	23	38	619	
Total.....	111	3,651	370	3,822	81	224	562	7,697
Train-service accidents.....	180	4,357	2,143	45,299	6,591	9,629	8,914	59,285
Total.....	291	8,008	2,513	49,121	6,672	9,853	9,476	66,982
Nontrain accidents.....			428	127,802	97	1,938	525	129,740
Grand total.....	291	8,008	2,941	176,923	6,769	11,791	10,001	196,722

From table 1c, which gives comparisons with preceding years, we copy the following:

TABLE NO. 1C.—Summary of casualties to persons for years named.

	Year ended Dec. 31, 1916		Year ended June 30, 1915	
	Killed	Injured	Killed	Injured
Passengers:				
In train accidents.....	111	3,651	89	4,648
Other causes.....	180	4,357	133	7,462
Total.....	291	8,008	222	12,110
Employees on duty:				
In train accidents.....	357	3,731	221	3,371
In coupling accidents.....	136	2,440	90	1,293
Overhead obstructions.....	63	1,538	45	1,083
Falling from cars.....	435	14,084	363	10,748
Other causes.....	1,219	26,517	870	20,865
Total.....	2,210	48,310	1,594	38,660
Total passengers, and employees on duty.....	2,501	56,318	1,816	50,170
Employees not on duty.....	303	811	215	840
Other persons not trespassing:				
In train accidents.....	9	73	7	110
Other causes.....	1,735	4,987	1,156	5,380
Total.....	1,744	5,060	1,163	5,390
Trespassers:				
In train accidents.....	72	151	88	161
Other causes.....	4,856	4,642	4,996	6,287
Total.....	4,928	4,793	5,084	6,448

TABLE NO. 2.—COLLISIONS AND DERAILMENTS FOR YEARS ENDING ON DATES NAMED

Classes.	Dec. 31, 1916			June 30, 1916			June 30, 1915		
	No.	Kil'd	Inj'd	No.	Kil'd	Inj'd	No.	Kil'd	Inj'd
Collisions:									
Rear.....	782	115	1,069	632	94	1,139	435	26	833
Butting.....	463	61	1,220	82	1,377	681,800	282	65	1,265
Broken train.....	414	5	73	330	4	38	303	3	77
Miscellaneous.....	4,078	85	1,583	3,440	72	1,306	2,518	40	1,078
Total.....	5,737	266	3,945	4,770	252	3,860	3,538	134	3,493
Deraillments due to—									
Defects of roadway.....	1,664	29	1,079	1,673	28	921	1,507	43	1,540
Defects of equipment.....	4,185	42	519	3,575	47	476	3,416	54	766
Negligence.....	826	47	474	716,600	621	334	589,900	244	30
Unforeseen obstruction.....	327	82	415	675	7	68	100,700	70	12
Malicious obstruction.....	60	9	65	75	7	68	100,700	70	12
Miscellaneous causes.....	1,191	49	581	1,047,400	1,090	47	634	1,026,800	1,315
Total.....	8,253	258	3,133	7,346,300	7,904	3,054	6,845,100	6,849	4,061
Total collisions and deraillments.....	13,990	524	7,078	\$11,228,200	12,674	510	\$10,019,100	10,387	7,553

	Year ended Dec. 31, 1916		Year ended June 30, 1915	
	Killed	Injured	Killed	Injured
Total in accidents involving train operation.....	9,476	66,982	8,278	62,848
Nontrain accidents.....	525	129,740	343	99,192
Grand total.....	10,001	196,722	8,621	162,040

Table 1b in the report gives the usual classification of casualties by causes. Table No. 2, which is reproduced herewith, shows the total number of collisions (5,737) and of deraillments (8,253). The bulletin shows collisions and deraillments for four years back and also two tables analyzing deraillments due to defective roadway and defective equipment for 15 years.

The number of persons shown in the quarterly report (October, November, and December, 1916,) as killed and injured on steam railways was 2,401; 152 killed and 2,249 injured. Total killed in all classes of accidents, 2,627; injured, 50,467.

The number of persons killed in accidents at highway grade crossings during the year, 1916, is given in a separate statement, showing the number of victims in each state. Of the total killed, 1,652, it appears that 121 were classed as trespassers.

The investigations of accidents by the inspectors of the commission, which were completed during the last quarter of 1916, numbered 22, and the reports of these investigations fill 55 pages of the bulletin. These 22 accidents occurred as follows:

Galveston H. & S. A.—Isler, Tex.....	Jan. 31	Deraillment
Pennsylvania—Lewistown Junction, Pa.....	Oct. 5	Rear collision
Cinn., Ind. & Western—Maplewood, Ind.....	Oct. 7	Butting collision
Western Maryland—Knobmount, W. Va.....	Oct. 12	Butting collision
Chic., Burl. & Quincy—Smithfield, Nebr.....	Oct. 15	Rear collision
Phil., Balt. & Wash.—Perryman, Md.....	Oct. 23	Deraillment
Union Pacific—Bushnell, Nebr.....	Oct. 23	Butting collision
Georgia Railroad—Union Point, Ga.....	Oct. 27	Deraillment
Delaware & Hudson—East End, N. Y.....	Oct. 31	Butting collision
Pennsylvania—New Portage Junction, Pa.....	Nov. 6	Rear collision
Chic., Mil. & St. Paul—Hornick, Iowa.....	Nov. 9	Deraillment
Chicago, R. L. & Pac.—Marion, Kan.....	Nov. 22	Rear collision
St. Louis, S. F.—Una, Mo.....	Nov. 23	Butting collision
Greenville & Western—Altamont, S. C.....	Nov. 24	Deraillment
Texas & Pacific—Strawn, Tex.....	Nov. 26	Rear collision
N. Y. & N. H. & H.—Beacon Falls, Conn.....	Dec. 2	Rear collision
Denver & R. G.—Price, Utah.....	Dec. 1	Rear collision
Nor. Pacific—Fast Helena, Mont.....	Dec. 7	Butting collision
St. Louis Southwestern—Waldo, Ark.....	Dec. 15	Deraillment
Central New England—New Hartford, Conn.....	Dec. 22	Butting collision
Boston & Albany—W. Springfield, Mass.....	Dec. 22	Butting collision
St. Joseph Valley—Inverness, Ind.....	Dec. 30	Rear collision

A tabular summary is given showing the causes of those accidents which were investigated during the six months ending December 31, 1916.

Electric railways reporting to the commission (not included in the foregoing statistics) had a total of 518 persons killed during the year and 4,606 injured. These roads had 216 train accidents, including 139 collisions and 53 deraillments. Train accidents are charged with 16 fatalities and 791 injuries. The total number of passengers killed from all causes was 34 and of employees 44, while 135 trespassers were killed.

J. M. HERBERT

James M. Herbert, who has been vice-president of the St. Louis Southwestern since August 1, 1916, has been elected president, succeeding Edwin Gould, who remains as chairman of the board of directors. Mr. Herbert's election as president is recognition on the part of the board of directors of the success which has been attained under Mr. Herbert's management in rehabilitating the St. Louis Southwestern. Mr. Herbert came to the property shortly after the death of F. H. Britton, president, from the Laramie, Hahn's Peak & Pacific, now the Colorado, Wyoming & Eastern. Many of the neighbors of the road were in the hands of receivers; the St. Louis Southwestern itself had been pretty badly undermaintained, and in general there was a situation that needed a strong hand. Mr. Herbert was just the man for such a situation. One distinguishing characteristic is his ability to make decisions promptly. Mr. Herbert is a man who can and does say yes or no to a proposition and this is a great quality in railroad work. In settling operating questions, prompt decisions are almost as essential as correct decisions. In settling traffic matters and in dealing with large shippers this ability to give a yes or no earns the respect of the shippers and makes business friends for a road. Mr. Herbert is a man of great energy, both physically and mentally.

He is a man who shoulders responsibility, who wants and takes the reins of management into his own hands, and has the capacity to handle a vast amount of work. Having come up from the lowest round in the operating department he has a thorough grasp of the details and he knows the Southwest thoroughly.

The equipment situation on the St. Louis Southwestern was particularly bad when Mr. Herbert came there. He has put through a vigorous program of scrapping obsolete equipment and rebuilding or extensively repairing a very large proportion of the company's box cars, and he has apparently got his cars in good shape. Remarkable progress has been made under his management in getting better mileage per day out of cars. In June, 1917, the average mileage per car per day was 35.3 as against 25.1 in June, 1916. Thirty-five miles per car per day is a high figure of itself and the increase as compared with a year ago amounts to over 40 per cent. A considerable improvement has been made in car loading, the average per loaded car being 20.4 in June, 1917, as against 17.7 in the same month in 1916; and a very large gain has been made in trainloading, the average trainload in June, 1917, being 466 tons, as against 351 tons a year ago in that month.

James M. Herbert was born January 15, 1863, at Belmont, Pa. He received a public school and high school education and began railroad work in 1880 as night telegraph operator on the Wabash, St. Louis & Pacific, now the Wabash. He

became station agent, then a yard clerk, later a despatcher, then chief train despatcher and finally trainmaster. In 1897 Mr. Herbert went to the Grand Trunk as trainmaster of the eastern division at Island Point, Vt. In the following year he was transferred to Belleville, Ont., and after two months was made superintendent of the eastern division of the Grand Trunk, with office at Montreal. In October, 1900, he went to the Missouri Pacific as superintendent of the Kansas and Colorado divisions, with office at Osawatimie. In the following year he was made general superintendent of the St. Louis, Iron Mountain & Southern and then went for a short time to the Southern Pacific. In November, 1901, he became general manager of the Denver & Rio Grande and the Rio Grande Western. On January 1, 1903, Mr. Herbert was appointed vice-president and general manager of the Colorado & Southern. In March, 1906, he left railroad work but later returned to it as president of the Colorado, Wyoming & Eastern.



J. M. Herbert

EMBARKATION CAMP
STARTED

The construction of a camp for the accommodation of troops during the period they may be compelled to await transportation overseas after reaching the port of embarkation is under way near Tenafly, N. J., at the port of New York. This camp has been named after the late Major Gen. Wesley E. Merritt, who fought in both the Civil and Spanish-American Wars. When completed it will be able to house 30,000 men. Regulars, former guardsmen and, later National Army contingents, coming from the South, will enter the camp while transports are awaited. No training will be attempted at this site, except incidentally.

The men will be housed in two-story wooden barracks, each accommodating 66 persons. As far as possible, the oaks and other shade trees, which dot the site, and the lawns and orchards will be preserved. The camp is not being established on strictly geometrical lines. Because of the attractiveness of the site, which is on high land a couple of miles back of the Palisades, the creation of the camp has been considered partly in the light of a problem in modern city building. The camp is to be ready in November. Ten thousand workmen will be employed within the next fortnight.

A similar camp is being constructed at Newport News on Hampton Roads.

CHINESE RAILWAY RETURNS FOR 1916.—The railway line from Canton to Shiuchow, 139.28 miles, was in operation for nine months during 1916 and carried a daily average of 3,382 passengers and 614 tons of freight, from which it derived revenues of \$1,553 and \$2,188, respectively. This is a part of the Canton-Hankow Railway, which was not extended during the year owing to financial difficulties.

WHAT THE RAILROADS' WAR BOARD HAS ACCOMPLISHED

Fairfax Harrison, chairman of the Railroads' War Board, has authorized the following statement giving a summary of its accomplishments:

Information gathered by the Railroads' War Board during the first four months of its existence, indicates that the voluntary act of the 693 railroads of this country in merging their competitive activities for the period of the war and uniting in one continental system, has not only made the transportation problem presented by the war less cumbersome to handle, but surer of satisfactory solution.

In addition to welding into one loyal army each and every one of the 1,750,000 persons employed by the railroads—from engine wipers to presidents—the co-ordination of the nations' carriers has made possible the most intensive use of every locomotive, every freight car, every mile of track and every piece of railroad equipment in the country. It has also facilitated the securing of invaluable co-operation from the shippers and the general public.

Some concrete instances of what has been accomplished through this co-operation of the railroads, the shippers and the public since April 21, when the War Board was created, may be summarized as follows:

The excess of unfilled car requisitions over idle cars, or what is commonly called car shortage, has been reduced 70 per cent. On April 30 the so-called car shortage amounted to 148,627. On June 30 these figures had been cut to 77,144. On August 1 the excess of unfilled car requisitions over idle cars amounted to only 33,776.

In the month of May, freight transportation service rendered by about 75 per cent of Class 1 roads was 16.1 per cent in excess of the service rendered in 1916. In that year, which was one of unusual activity, the freight service rendered by the carriers was 24 per cent greater than in 1915, so the carriers achieved the astounding feat of adding to their freight service, in the short space of two years, an amount equal to the freight traffic of Great Britain, France, Russia, Germany and Austria combined.

Approximately, 20,000,000 miles of train service a year have been saved by the elimination of all passenger trains not essential to the most pressing needs of the country. This reduction of passenger service has released hundreds of locomotives and train crews and cleared thousand of miles of track that are absolutely needed in the freight service for the transportation of necessities.

Freight congestion at many important shipping points has been averted by promptly moving empty cars from one railroad to another, irrespective of ownership. By ordering the adoption of this policy, which is brand new to American railroad usage, the Railroads' War Board has moved 113,420 empty freight cars into districts where they have been more needed.

Through the pooling of lake coal and lake ore, a saving of 52,000 cars in moving those commodities alone has been achieved.

A further saving of 133,000 cars has been made possible by the pooling of tidewater coal. Both of these pooling projects were brought about by the Railroads' War Board in collaboration with the Committee on Coal Production of the Council of National Defense.

By regulating the movement of grain for export, the number of cars ordinarily required for this service has been reduced, despite an abnormal export increase this year, 75,-682,028 bushels of wheat, corn, barley and oats being shipped to the Allies from May 1 to July 14. This business was so handled that there were no delays and no blocking of facilities at either the grain elevators or the seaports.

Although the figures on the intensive loading of freight cars are not complete as yet, a sufficient number of reports

have been received from the 27 local committees of the War Board to show that commercial bodies and individual shippers in all parts of the country are giving hearty co-operation to the railroads' campaign "to make one car do the work of two." Checks made recently in Florida and Georgia on loaded potato cars show for instance that cars are carrying 200 bbl. this year against 125 bbl. last year. Checks made in Chicago show that cement cars are now carrying 77,000 lb. as against 70,000 lb. last year. In Pittsburgh, tin plate cars that carried 92 per cent of their marked capacity on June 27 last are now being loaded to carry 98.6 per cent. In Minnesota the average carload of flour in 1916 amounted to 46,250 lb.; this year the average carload is 61,923 lb. In New Orleans, sugar cars that were being loaded to carry only 40,000 lb. three months ago, now carry an average load of 80,000 lb. In other parts of the country, sugar refineries have voluntarily increased their minimum capacity 25 per cent, or from 40,000 lb. to 50,000 lb.

Some figures that throw a clear light on the efforts that both the shippers and the railroads are making to relieve the coal situation were supplied a few days ago by the Western Maryland. A check of 540 cars of coal loaded on its line showed only 7 cars that were loaded below marked capacity. The average lading of the 540 cars was 111.14 per cent, or 11.14 per cent above the marked capacity.

A summary of coal mine operations for the month of July showed that a total of 132 railroads handling anthracite, soft coal and lignite transported 207,429 more loaded cars from the mines than for the same month last year—an increase of 31.5 per cent, or 10,316,990 tons.

In their efforts to shoulder the abnormal burden thrust upon them by the entrance of this country into the war, the railroads have not confined themselves solely to the task of making one car do double work. Through their War Board they have also supplied the government with every facility possible for intelligent co-operation in the handling of every military problem involving the transportation of troops and supplies. Skilled and experienced railroad men have been sent to every cantonment to assist the constructing quartermasters there in the movement of all supplies necessary to the erection and maintenance of these military cities. A trained executive has also been stationed in the Washington headquarters of the supervising constructing quartermaster, so that every car used in the transportation of government supplies might be made available when needed. As a result of these co-operative activities the movement of thousands of carloads of lumber and other supplies to the cantonments has been accomplished practically without a hitch.

In addition, and at the request of the government, plans have been perfected whereby one million men are to be moved from nearly five thousand different points to the 32 training camps for the National Army and National Guard by October 20. About one-third of these men, the National Guard, are already under way and are carrying their tents and equipment with them. This means that in addition to the coaches and tourist sleepers occupied by them more than 12,000 freight cars must be transported.

No special difficulty would present itself in accomplishing these troop movements if they represented all that the railroads were being called upon to perform at this time. But the movement of these million soldiers to their training quarters must not be permitted to interfere with the general movement of freight and passenger traffic, if such interference can possibly be avoided. Right here it may be stated that freight of all kinds is now moving in unexampled volume. Practically every factory in the country is working to its capacity turning out supplies for the Allies, for this government and for the general use of the American people. The grain crop is also beginning to move. Soon cotton will be ready for shipment. Moreover, the transportation of fuel cannot be interrupted for a moment, although each month the railroads

are carrying from the mouths of the mines six million tons more than they ever carried before. All of this traffic must be taken care of, and at the same time the million men upon whom this government counts for the speedy and successful termination of the war must be brought to the places where they are to receive their training. Organization, much hard work and the faithful help of the 1,750,000 men who man and operate the railroads is making the accomplishment possible.

Among some of the other things accomplished by the board during the first four months of its existence, have been the designing of special equipment for hospital and troop train service, the standardization of settlements between the government and the railroads, eliminating a large volume of correspondence and red tape, and the creation of a Special Committee on Express Transportation, composed of the vice-presidents of the American, Wells-Fargo, Adams and Southern express companies, to co-operate the work of the companies with the general problem of transportation.

The War Board is divided into departmental committees, who work in conjunction with the military department of the government, and also sub-committees on car service, equipment standards, transportation accounting, passenger tariffs, freight tariffs, material and supplies, and express transportation.

It has stationed general agents at all military headquarters with the specific duty of co-operating with the military officers at these points. There are 112 of these places and approximately 250 trained railroad officers have been assigned to them.

In addition, the Board has 69 general employees and 18 inspectors, who are kept in the field constantly.

In order to keep a close watch on local conditions and to promptly meet whatever difficulties may arise in any part of the country, sub-committees have been formed at Chicago, New York, Atlanta, San Francisco, Seattle, New Orleans and similar big traffic centers. These committees are co-operating with the shipping and traveling public as well as with the military authorities.

The Washington organization of the railroads employs 27 experienced railroad officers, including the five executives on the War Board, practically all of whom are there all the time. It also includes trained experts for every phase of the work confronting the railroads.

The war has created a demand for so many new kinds of business and so many new sources of business that abnormal movements of freight are constantly taking place in unaccustomed directions. Under the directions of the War Board every effort is being made to meet these demands, but the railroads by themselves cannot be expected to solve the whole transportation problem which the war has produced.

If the maximum amount of transportation service is to be obtained, the shipping and traveling public and all railway employees will have to continue to co-operate in many ways, submit to many inconveniences and sometimes even bear losses due to changes in the transportation service. One of the most encouraging features of the situation noted by the War Board is that both shipper and the general public appear to be reaching a clear understanding to that effect. This is shown by the encouraging reports coming from all parts of the country in conjunction with the heavier loading of cars, and the reduction in complaints concerning the elimination of all passenger trains whose operation was not absolutely essential and which were being run for the benefit of the few rather than the benefit of the country at large.

NETHERLANDS REDUCED TRANSPORTATION.—A cablegram from the American Legation at The Hague says that restriction in train service throughout Holland 40 per cent is contemplated, effective September 24, owing to coal shortage.

REPORT OF O'DONNELL FULL-CREW-LAW COMMITTEE

The executive committee of the Associated Railroads of Pennsylvania and New Jersey, R. L. O'Donnell, chairman, which committee was created early in 1915 to carry on a campaign for the repeal of the full-crew laws of New Jersey and Pennsylvania, has made a report, recounting what has been done, and recommending that the railroads establish a permanent committee to deal with such problems as the one which has engaged the attention of this committee; namely, problems where it is for the interest of the railways to act in unison in enlightening the public.

Following is a full abstract of the report:

The committee has found its work broadened. To attack with reasonable show for success, entailed a large treatment of the relationships of the railroads with bodies of their employees, with owners of railroad securities, and, above all, with the public and its elected representatives. In far greater measure than can be made clear in any report of definite results, the campaign made has been productive of good. It has been greatly instrumental in establishing a right understanding between the railroads and the public, and in clearing away many false impressions, harmful alike to all concerned.

The full crew law of New Jersey has been changed so that now the excess man may be taken off trains when the railroads show the public utility commissioners that he is not needed for safe and efficient operation of the trains and authorizes his removal. Because of the urgent necessity that the man power of the country should be mobilized for essential services and it being felt to be highly important that some 2,000 trained men held in useless jobs should be immediately released to crew additional trains, a different form of bill was finally introduced into the Pennsylvania legislature. It was drawn so as to suspend the full crew law for the period of the war and for six months thereafter. It was passed by the Assembly of Pennsylvania by a vote of 113 to 84 and by the Senate by a vote of 32 to 13, after being amended to read one month after the close of the war instead of six months. Two years before, the previous legislature overwhelmingly passed a bill repealing the full crew law but empowering the public service commission to require railroads to properly man trains. Again withholding action until the last day given him under the Constitution, Governor Brumbaugh on July 28, 1917, vetoed this latest bill, as he did that passed by the legislature two years ago. [The veto message is reprinted in full.]

During the recent session of the Pennsylvania legislature there were introduced 143 bills inimical or harmful to the railroads, corporate interests in general and against the public weal. No bills were passed which adversely affected railroads; the public mind and the thought of legislators has been aroused. * * * In New Jersey there were introduced, during the legislative session of 1917, 52 bills of objectionable character. * * * Only three were enacted into laws which could be considered as unfavorable. These were laws increasing taxes, and even they were so amended as to be much less objectionable than they were in the form in which they were introduced.

The press has recognized and given enlightened and earnest support to the work of your committee, and is giving liberal and broad-minded attention to all matters and problems in which the railroads are concerned, because those problems also intimately affect the welfare of the American people, the progress of the nation.

The New Jersey State Chamber of Commerce made a very exhaustive investigation of the operation of the full crew laws in this country giving particular reference to Pennsylvania, New Jersey and New York; and, upon the basis of its inquiry determined to make the fight for a repeal of the then

existing full crew law one of its principal legislative planks. This report of the State Chamber was so important that your committee made arrangements to have it printed for general distribution. The high character of this investigation was brought out by the Governor of New Jersey when he said in public hearing, just before signing the bill, that the facts in the State Chamber report had not been questioned by the opposition. The State Chamber worked energetically. It arranged for and made 42 addresses in New Jersey and furnished a speaker to appear at the public hearing at Harrisburg, Pa. The Pennsylvania State Chamber of Commerce and its members also performed effective supporting work.

RECOMMENDATIONS

From such firm and broad foundations as have been laid your committee earnestly feels—more, is entirely convinced—that constructive action should now press forward. The whole situation urges it. Your committee feels that it would be negligent in its duty if it did not again urge its recommendations of two years ago.

* * * The railroads should, in the proper manner, actively identify themselves with matters of public interest and doing so freely exercise their citizen rights. Their course should be openly taken and so laid in all matters as to command the respect, if not the support, of an informed public. Experience confirms the conviction that the American people as a body think clearly, judge wisely, deal fairly and act justly. Their informed judgment can be trusted. The essential thing, therefore, is for the railroads to get the attention and to reach the understanding of the American people. This can be done in many ways, but in none so effectively as through the press of the country. Such agency must be utilized to get anywhere. * * * Your committee has found a virtually universal readiness on the part of the press to give publicity to news, and to statements of public interest. Railroad executives can do no service greater for the companies they manage, the stockholders they represent, and the public they seek to serve than to clearly and frankly meet the outside questions which constantly arise.

In greater part this can be done through the simple process of giving an interview or making a statement when something should be said. A statement from an executive or other officer of a company carries public interest, not only for what is said but in proportion to the importance of the position of the man making it.

But while the columns of the press are open to all proper statements and news, there is often a distinct advantage in presenting a matter exactly as you think will best place it before the court of public opinion. On such occasions a carefully prepared advertisement makes not only the proper but the best vehicle. The use of advertising space is perfectly legitimate. A statement made in such a way strikes home as a business proposition. It challenges attention.

A forward working organization is required. It should take permanent form and start with a public statement of the reasons for its establishment. It is recommended that there be created a central committee to represent all railroads in a certain territory—say Pennsylvania, New Jersey, Delaware and Maryland—such committee to act for them in all matters of general concern and of public policy, the great object being always constructive and as such to promote measures for the common good, while also moving to prevent ill considered legislation.

Such central committee should have its life from the various railroads and should supplement, without interfering with, the activities which it is strongly urged each company shall conduct through a Department of Public Policy and Relations. There is abundant, important and continuing work for such a department in the railroad organization. It could take up matters, no matter how big, in which the public is interested and both act and speak with authority.

Through such department each railroad could work with effect to establish and maintain cordial relations with the public and its patrons, and the communities it serves in particular. The direct intercourse and clear understanding of local conditions would enable such department, intelligently conducted, to perform valuable service for the railroads and the industries and people in their territory. The work would accomplish most, in the opinion of your committee, conducted with broad minded publicity; it would be rendered abortive by narrow press agent attempts.

The recommended central committee should be established forthwith, that the cumulative result of the present committee's activities be not lost. Your committee urges this with every possible earnestness. The expense of such a central committee would be small measured by what it could do.

The proposed organization obviously would have tremendous power and influence, which wrongly directed could do great harm before the might of public opinion would crush it out. But by being held firmly to a rigid responsibility for its acts, best assured by constant insistence upon fullest publicity concerning what it does, the organization would serve good purposes.

There is no reason why the railroads should not, and abundant cause why they should press forward for all that is fair and right. They should do it courageously and without apology, for none is necessary. They should be equally careful not to ask for what they are not fairly entitled to have. They should proceed in the open. Frank publicity is their greatest protection. So also is the public best protected. An honest proposition thrives through publicity. On the other hand, publicity destroys one that is crooked or unfair.

WORK OF COMMITTEE

Exercising citizen rights, your committee turned attention first to the primary and later to the general elections, and at each stage gave its support to those candidates who were regarded as best qualified to represent the public. In the legislative sessions, your committee again exercised the citizen right to discuss with senators and assemblymen the merits or demerits of proposed legislation. Nothing was said or done that calls for defense, apology or explanation. The total expenditure to August 31, was \$87,063 of which \$15,826 was the cost of advertisements published to ensure a correct understanding of the change proposed and accomplished in the New Jersey Law. [A financial statement is appended.]

Governor Brumbaugh waited the full time which the Constitution gave him, and then issued his veto message. By building up a case upon false premises, Governor Brumbaugh charged the railroads with misrepresentation and bad faith. Such charges are not warranted by the facts. * * * It seems regrettable, at least, that Governor Brumbaugh should have twice seen fit to be the one man to keep in operation a law which forces upon the railroads of Pennsylvania and indirectly upon the public an expense of about \$1,500,000 per annum and which wastes the services of some 2,000 experienced trainmen.

The report gives the names of the 21 railroad officers, representing 21 roads, who constituted the supervising committee, and is signed by the five members of the executive committee, namely: R. L. O'Donnell (Pennsylvania), J. S. Fisher (New York Central), J. E. Turk (Philadelphia & Reading), G. B. Minshull (Lehigh Valley), C. C. F. Bent (Baltimore & Ohio).

CANADIAN RAILS FOR FRANCE.—In connection with the removal of rails from portions of the Grand Trunk Pacific in the Rocky Mountain District, for shipment to France, the company says some of these rails will be replaced by steel taken from the adjacent Canadian Northern line, and in some cases the Grand Trunk Pacific trains will be operated over the Canadian Northern grade.

Large Capacity Tank Cars for the Santa Fe

Latest Revised M. C. B. Specifications Are Followed.
Several Novel Details Are Included in the Design

THE Santa Fe has ordered from the Pressed Steel Car Company, 500 tank cars of 12,000 gal. capacity which are to be used largely in the company's service for handling fuel oil. These cars were designed by the railroad in accordance with the M. C. B. specifications for class III tank cars as revised in 1916.

The barrel of the tank is of open hearth steel plate, the bot-

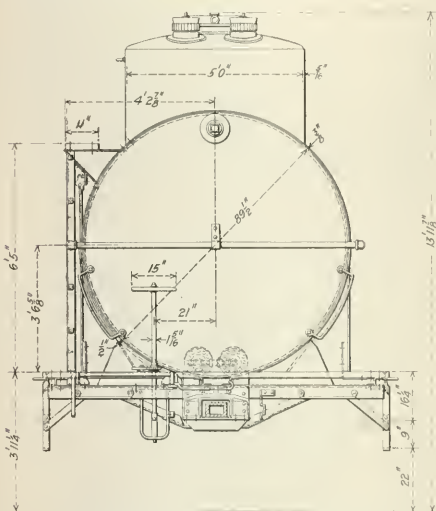
tom cover has the usual outlets just below the flange to allow any pressure confined in the tank to escape before the cover is removed. There is a special lead gasket provided on the lower side of the flange of the tank cover and four holes spaced at 90 deg. are cored in the top so that pipes may be inserted to facilitate the application and removal of the cover.

One of the unique features of the construction is the application of splash plates to prevent an unequal distribution of weight on the trucks during brake applications. Two of these splash plates are provided, one on each side of the center of the tank and 6 ft. 6 in. from the center. They consist of two sections of 5/16 in. plate, each 18 in. wide, the upper plate placed 3 in. from the inside of the top of the tank shell and with a 5 3/8 in. space between the upper and lower plates. They are secured to the shell by 5/16 in. gusset plates. The bottom outlet valve casing is of the usual type except that it has an internal thread above the valve seat into which a casting is fitted which serves as a valve rod guide and also prevents foreign substances from getting under the valve seat. The safety valves are two in number of the latest M. C. B. standard type attached to the top of the dome and set to open at a pressure of 25 lb. per sq. in.

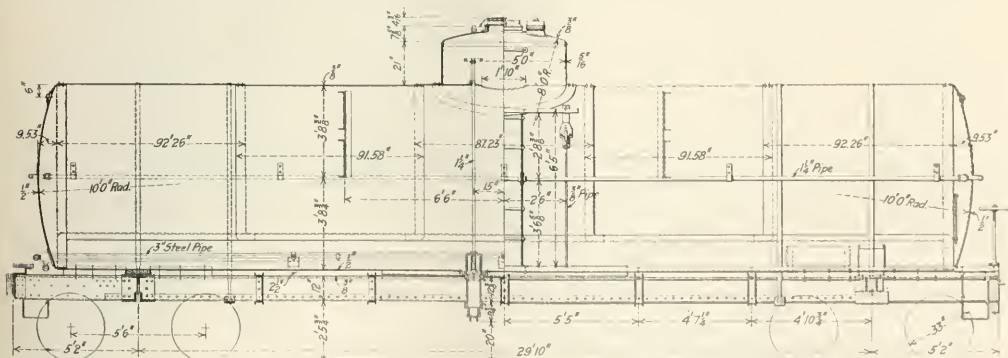
An ingenious method of fastening has been used on the handholds at the ends of the tank. As the vapor given off by fuel oil is poisonous the cars must be steamed out before it is safe for a workman to enter them to make repairs. In order that the handholds may be replaced from the outside they are attached with a special stud which is illustrated. The section is such that breakage is most apt to occur outside the hexagonal portion of the stud, in which case it can be readily removed with a wrench. In case the stud is broken flush with the tank it can be drilled out and replaced from the outside.

In one end of the tank near the top a 4-in. pipe flange and plug are provided to facilitate washing out the tank. The heater pipes are arranged according to the Vapor Car Heating Company's system. Two flanged couplings are provided

tom being a continuous plate 1/2 in. thick and 83 in. wide. The upper part of the barrel is in five sections of 3/8 in. plate. The heads are 1/2 in. thick and are dished to a radius of



End View of the Santa Fe Tank Car



Santa Fe Tank Car Built in Accordance with the New M. C. B. Specifications

10 ft. The dome is 5 ft. in diameter inside and is made of 5/16 in. plate on the sides and 3/8 in. on the top. The dome cover is dished to a radius of 8 ft. The dome ring is of cast steel and the dome cover of malleable iron. The

at one end of the car. The main steampipes, 3 in. in diameter, are screwed into these castings and extend along the bottom of the tank for nearly the entire length, being closed at the end with a pipe cap. Inside each of the 3-in. pipes

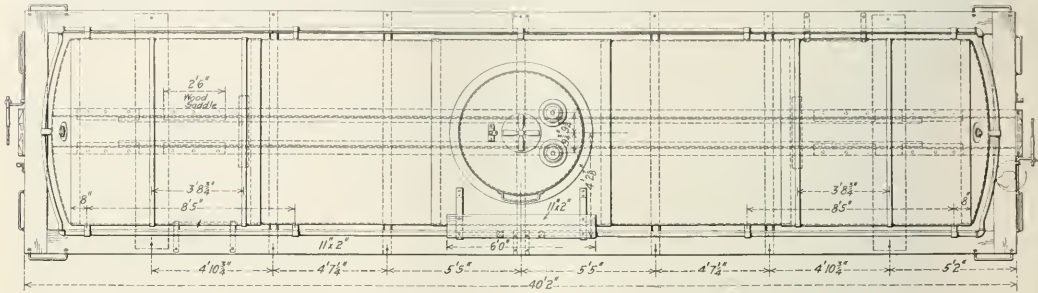
is a 1-in. pipe held in position by star couplings. The end castings are joined by slip joints and the steam pipes lead to a trap under the tank.

The underframe is designed principally to resist buffing stresses since the tank is largely supported at the bolsters. The center sill is made up of two 12-in. 35-lb. ship channels spaced $14\frac{1}{4}$ in. back to back, reinforced on the top by a $\frac{3}{8}$ -in. cover plate 22 in. wide extending the full length of the car and at the bottom by two $3\frac{1}{2}$ in. by $2\frac{1}{2}$ in. by $\frac{1}{2}$

$2\frac{1}{2}$ in. by $\frac{5}{16}$ in. angles connected to the bottom flange of the center sill channel.

The tank is secured against end shifting by anchors 10 ft. long of $\frac{1}{2}$ in. pressed steel. These are secured to the bottom of the tank with $\frac{3}{4}$ in. rivets and are fastened with 1 in. bolts of double refined iron to anchor supporting plates $5\frac{1}{4}$ in. wide, $\frac{1}{2}$ in. thick and 10 ft. 4 in. long, riveted to the center sills.

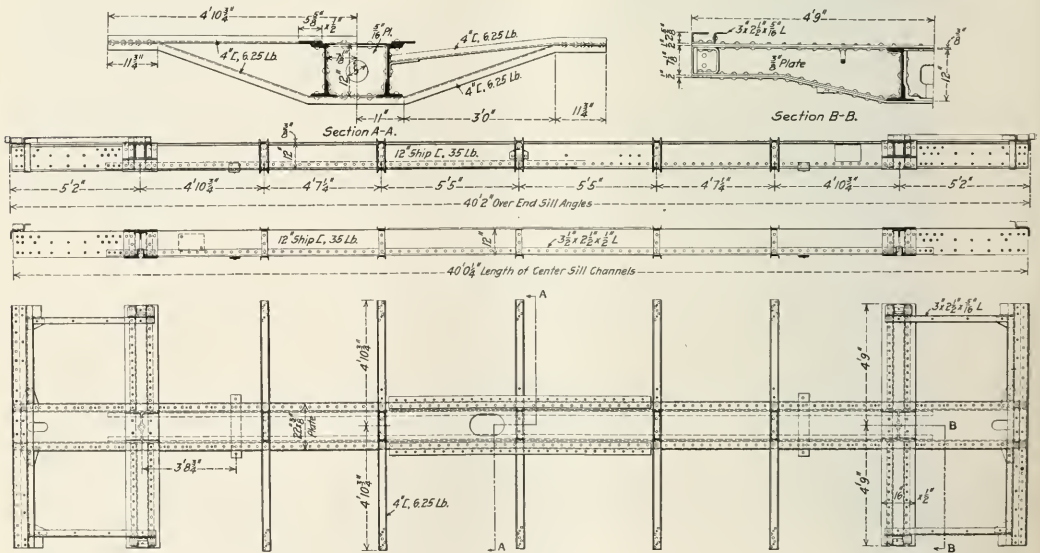
The end running boards are supported by the end sill cover



Plan View of the Santa Fe Tank Car

in. angles, extending 16 in. beyond the centers of the bolsters. Five stiffeners of pressed steel are located between the channels. The body bolsters are of built-up construction with a cast steel center filler and $\frac{3}{8}$ in. pressed steel side diaphragms spaced 5 in. back to back and reinforced on top and bottom by $\frac{1}{2}$ in. steel plates 16 in. wide. On top of the

plates by Z-shaped brackets of $\frac{1}{4}$ -in. plate. The side running boards are supported between the end sill and the body bolster by 3-in. by $2\frac{1}{2}$ -in. by $\frac{5}{16}$ -in. angles. Between the bolsters four supports are provided which are formed of 4-in., $6\frac{1}{4}$ -lb. channels placed back to back under the running board and riveted together, one running over the



Underframe of the Santa Fe Tank Car

bolsters are cradles built up of $\frac{5}{16}$ in. plate. Wooden blocks fitted into these cradles support the tank at each end. Push pole pockets are riveted to each end of the bolsters on the side nearest to the end of the car.

The end sills are built up of 4 in. by 4 in. by $\frac{1}{2}$ in. steel angles reinforced on top by a Z-shaped cover plate $\frac{5}{16}$ in. thick. The ends of the end sills are supported by 3 in. by

top and one under the bottom of the center sills, to which they are also riveted.

The draft gear is of the friction type Miner class A-18-R. The draft lugs are of cast steel, the front and rear lugs on each side forming an integral casting. The coupler yokes are of open hearth steel, $5\frac{1}{2}$ in. by $1\frac{1}{2}$ in., fastened to the couplers with rivets of double refined iron. The couplers

have 5-in. by 7-in. shanks and 9 1/8-in. butts. The coupler is supported by a carrier wearing casting placed on the carrier iron which furnishes a large bearing surface and reduces the wear on the coupler.

The trucks are of the Andrews cast steel side frame type with cast steel truck bolsters equipped with Barber roller lateral motion device. Cast iron wheels and malleable iron journal boxes are used. Among other specialties are Westinghouse brakes, Simplex couplers, Creco brake beams, National malleable journal boxes and the Imperial uncoupling arrangement.

RAILWAY ENGINEERS GETTING INTO THE FIGHT

A telegram from General Pershing last Monday night brought news of the first casualties in the American expeditionary forces in France.

The War Department's announcement said: "The department is advised that Sergeant M. G. Calderwood and Private W. F. Brannigan, Company F, Eleventh Railway Engineers, were slightly wounded by a bursting shell."

This announcement is the first official intimation that the railway engineers have arrived in France. The *Railway Age Gazette* has understood that the engineers had arrived in England, but it has not said as much in its columns, because of the request of the Committee on Public Information that secrecy be observed in all matters of "information tending to disclose the number or identity of troops in the expeditionary forces abroad."

The Eleventh Railway Engineers were formerly known as the First Reserve Engineers. They were recruited in New York and constituted the first of the nine railway engineer regiments. The American railway engineer regiments are not attached to Pershing's army, but are on duty behind the British and French fronts, aiding those nations in the operation of their supply lines.

Little information besides this has come across the ocean as yet relative to the work that the railway engineers are doing behind the lines. There are battalions of Canadian railway engineers overseas, however, and the work that they have done has been like that which the American railwaymen will have to do. What have these Canadian regiments been doing?

THE FIRST BATTALION OF CANADIAN RAILWAY TROOPS

The organization of this battalion, under the name of the 1st Canadian Overseas Railway Construction Battalion, says the Canadian Railway and Marine World, was started in Toronto, early in May, 1916; branch offices were opened at St. John, N. B., Montreal, Ottawa, Pembroke, Hamilton, London, North Bay, Sudbury, Cochrane and Fort William. Recruits were taken everywhere throughout the territory between Halifax and Winnipeg, a few men coming from Edmonton and other western centers to enlist. On July 28, 1916, after recruiting was completed, the battalion went into camp at Valcartier, Que., for training, sailing for England on Sept. 13, 1916. While it was expected that a sojourn of at least two months would be made in England, the battalion found itself actually engaged on railway work in France on Oct. 28, 1916. Probably no other battalion from Canada spent so short a time in getting its men, and its training; and in afterwards getting overseas and down to actual business in France. There have been a number of changes in the officers since the battalion went overseas, owing to promotions, but with one exception, all the original officers are still with the battalion. Capt. G. S. F. Grant has been invalided home to Canada. The organization is now as follows:

Headquarters Company: Officer commanding, Lt. Col. Blair Ripley. M.Can.Soc.C.E., M.Am.Soc.C.E., engineer of

grade separation, C. P. R., Toronto; 2nd in command, Major T. T. Loudon, professor civil engineering, Toronto University, and consulting engineer, Toronto; Chief Engineer, Major Wm. Monds, of Clarke and Monds, consulting engineers and contractors, Toronto; Capt. and Adj., E. D. Toye, storkeeper, Eastern Lines, Canadian Northern, Toronto; Quartermaster, Capt. E. P. Muntz, B.A.Sc., Welland Canal staff; Paymaster, Capt. H. G. Henson, B.A.Sc., McGill University; Medical Officer, Capt. C. P. Fenwick; Chaplain, Capt. E. F. Church; Transport Officer, Mechanical and Horse Transport, Lieut. G. O. Fleming, Toronto Ry.; Officer in Charge Technical Stores and Equipment, Lieut. L. McD. Fleming, formerly private secretary to Sir George Bury, Vice President, C. P. R.; Veterinary Officer, Capt. T. R. R. Hogan.

A Company.—Officer commanding, Major J. B. Heron, division engineer, Canadian Northern; 2nd in command, Capt. G. B. Little, contractor, Canadian Northern; Lieutenants, G. A. Butler, division engineer, National Transcontinental; C. P. VanNorman, engineer, Toronto and York Radial Ry.; F. G. Pusey, engineer and contractor; W. J. Wright, civil engineer.

B Company.—Officer commanding, Major A. R. Ketterson, assistant bridge engineer, C. P. R.; 2nd in command, Capt. H. B. Muckleston, assistant chief engineer, natural resources department, C. P. R., Calgary; Lieutenants, G. H. Pethick, engineer and contractor; F. A. R. McNair, superintendent, Toronto Works Department; J. A. Hamilton, bridge and building master, C. P. R.; H. J. Black, resident engineer, C. P. R.

C Company.—Officer commanding, Major Holland, division engineer, National Transcontinental; 2nd in command, Capt. L. B. Allan, assistant engineer, City Works Department, Toronto; Lieutenants, W. J. Norman, resident engineer, C. P. R.; R. F. Francis, structural contractor; E. H. Jupp, civil engineer and contractor; O. P. Hertzberg, engineering department, C. P. R.

D Company.—Officer commanding, Major F. G. Cross, inspecting engineer, natural resources dept., C. P. R.; 2nd in command, Capt. A. T. MacDonald, resident engineer, C. P. R.; Lieutenants, G. M. Saul, civil engineer; H. M. Jupp, engineer and contractor; H. R. McQueen, civil engineer; H. L. Gilmour, civil engineer; R. E. Lindsay, civil engineer.

The battalion includes 6 warrant officers, 52 staff sergeants and sergeants, 89 corporals, and 40 lance-corporals, making a total strength of 1,065 all told. The transport consists of 10 riding horses, 100 teams of mules, 2 motor cars, 8 light motor trucks, 9 heavy motor trucks, 4 field kitchens, 4 water carts, etc. The equipment consists of practically the same articles that would be used in Canada under peace conditions. Each company and headquarters is furnished with first-class engineering and surveying equipment, and each carries one surveyor with the regular survey party. Tools comprise practically everything that is necessary in building a roadbed, culverts, bridges and buildings and the tracklaying and ballasting of a railway, and the size of the outfit can be judged from the fact that it took three train loads, totalling 130 cars to move the battalion from its former location in France to its present one. The battalion's headquarters staff is quartered, and moves about in railway cars that have been fitted up specially for the purpose. These comprise an office car for the officer commanding and the second in command; orderly room car, in which the battalion's regular business, including preparation of plans and reports, etc., is carried on; tool car, messing car, cooking car, and two sleeping cars. The battalion also carries with it a pile driving apparatus, which was built in France, and occupies three cars. The majority of the men live in tents, but comfortable huts are being acquired to carry about with the battalion when conditions permit. They are collapsible and are easily taken down and set up again.

When the battalion first arrived in France it was put on

to double tracking of a then existing standard gage line, which it double tracked for eight miles, and station yards and terminals were doubled in capacity. In addition to the laying of track, putting in switches, ballasting, etc., the men moved 34,000 cu. yd. of earth, and the whole work was done in 28 days, which would probably compare favorably with similar work done in peace times in Canada. There was rather a novel experience on this work, in connection with putting in a water supply, which had been under consideration for months. Water was being hauled in in railway tanks and dumped into a reservoir, and on several occasions the consumption was such that the reservoir was nearly emptied before a further supply was brought in. A "push" was contemplated at the time, and it was deemed of the utmost importance that a safe and sufficient water supply be put in. Surveys were quickly made by members of the battalion, and it was found necessary to lay 30,000 ft. of 6 in. pipe line, and to pump the water against a head of nearly 300 ft. The pumps and other material were quickly secured and the excavation for the laying of the mains and the elevated water tanks was started at once. It was explained to the men that the work must be completed in less than two weeks' time, and notwithstanding the terrible weather encountered, the system was in operation on the tenth day. From the above mentioned work and location the battalion was suddenly moved on to light railways on a portion of the western front. Two weeks afterward it took over a portion of the French area, which was further augmented at a later date, and during last winter the battalion handled not only the maintenance of all the light railways in the Army, but did all the construction on the forward lines, some of which ran well in advance of the field guns. The light railway handled in the area referred to constituted more than half of the light railways on the western front at the time. Six light railway construction and maintenance companies of 250 men each, were organized and worked with the battalion, under its instructions on this work.

The importance of light railways and the difficulties of maintenance and construction, should not be underestimated. Some of them are built in summer when the ground is dry and when it is possible to operate them without ballast, and of course when winter comes on, the maintenance is a very big matter, the battalion's experience last winter being, that in some cases it took 20 men per mile, which is very large when it is considered that two or three men per mile will maintain standard gage railways in Canada. For ballast, brick from ruined towns and villages is hauled in and tamped underneath the steel ties, and where ballast is not obtainable, it is necessary to salvage boards, pieces of planks, sheets of galvanized iron, or whatever is available, to be laid longitudinally under the track to keep it from sinking into the mud, so that operations can be carried on and rations and munitions carried up to the men at the front. A good deal of not only construction but maintenance had to be done at times when weather conditions would not permit the enemy's viewing the battalion, otherwise heavy casualties would have resulted. This necessitated the doing of considerable work at night, and the choosing of dull and foggy days, which were not uncommon, for the rest. The lines, of course, were built as far as possible so as not to be under observation, but this could not always be done.

When lines were taken over from the French, in order to keep things going, it was necessary for the battalion not only to handle maintenance and construction, but operation also. The operation was very novel and pleasing to the men, and the locomotive men and firemen, fitters, etc., were brought into play. This was their work, and they were right at home again. The battalion was able to furnish 25 locomotive men immediately.

Last spring, when the German retreat began, the battalion was at once taken off the light railways and put on to stan-

dard gage ones. Surveys were made quickly and the first 11 miles connecting up with a well known city which had been blown to pieces by the Huns before retiring, was put in and operated on the fourteenth day. The battalion had a good many trains off the track during construction on account of the mud, shell holes, etc., but fortunately the line has been doing good service ever since. Four days after it was handed over for operation, it was munitioning and feeding 80,000 men. The battalion was very short of equipment on this work, and notwithstanding the fact that it had only six spike mauls of the regular pattern to put in the spikes, an average of a mile a day, including grading and track laying, was maintained. The rails and ties had to be man handled. The battalion had on this work, attached to it for labor, two brigades, consisting of the flower of the British army, including many titled officers. One of them, an Earl, was called by the rest of the officers "Lizzie," and as a matter of fact they all had nicknames. The spirit of these officers was splendid.

On standard gage work in that area last spring the battalion built altogether about 60 miles of track, the larger portion of which is double tracked, and the line was of such importance that it was ballasted with crushed rock. A large volume of traffic is being carried over it. It was blown up in one or two places by the enemy during construction, but quickly repaired without casualties. This line was carried so close to the Hindenburg line that the army command deemed it wise to discontinue the work, which the men of the battalion were only too anxious at the time to carry on.

The battalion is now in a new area, and on a very agreeable piece of work, where its experiences will not be quite so strenuous as they were at a previous location. Since spring the battalion's equipment has been brought up to what it should be, and it is now in a position to do good work. Without the use of an American track laying machine the battalion accomplished a mile and three-quarters of standard gage track laying in a single day.

ELECTRIFICATION OF THE GOTTHARD RAILWAY.—In view of the difficult conditions under which the Gotthardbahn has to work, the administration of the S. B. B. (Swiss Federal Railways) has resolved to apply for a credit of 2,030,000 francs for the construction of four trial electric locomotives, which are to be tested thoroughly before the final design is decided on. The locomotives are to be run on the Scherzlingen-Spiez-Brig section of the Lötschberg railway, which resembles the Gotthard railway in the general condition of the track. The experience already gained on the Lötschberg line is not considered sufficient therefore. The four trial locomotives are to be of three types, and to be supplied by Messrs. Brown, Boveri and Co., the Maschinenfabrik Oerlikon, and the Lokomotivfabrik Winterthur.—*Engineering, London.*

LABORATORY RAILROAD CARS.—The American Red Cross authorizes the following: The medical advisory committee of the Red Cross war council has decided to equip five laboratory railroad cars, which will be prepared for emergency work against possible outbreaks of epidemics in cantonment camps in this country. Each car will have a staff of five or more experts and will be so stationed at various cities that any cantonment can be reached with one of these laboratory cars within 24 hours on receipt of request from Federal or State authorities. The United States Public Health Service has such a mobile laboratory unit, and Surgeon General Rupert Blue said the Red Cross cars would prove of the greatest assistance in the control of civilian sanitary districts. The plan has also been commended by the Surgeons General of the United States Army and Navy.

Wooding's Automatic Train-Stop

A Spring-Supported Contact Rail, Made Movable to Break Ice; Interesting Experiments with Speed-Control

THE automatic train-stop devised by Dr. B. F. Wooding, of Denver, Colo., which has figured in the reports of the Interstate Commerce Commission for several years past, is the subject of a special report, by the Division of Safety, which has just been issued and which has been sent by the Commission to Congress. It is printed as House Document No. 251. The report covers tests made on the Delaware, Lackawanna & Western, near Newark, N. J., in the first four months of this year, including some experience with freezing weather.

This train-stop, which includes a speed-control apparatus, is of the intermittent electrical contact type, and the most prominent feature peculiar to the Wooding system is the ramp, which is illustrated in Figs. 2 and 4.

The report, as to the main features of the system, is fav-

ing intended to provide a comparatively gradual deflection of the locomotive contact shoe, while the deflection at a stop ramp, was designed to be quicker.

One locomotive, No. 967, was equipped. It was regularly assigned to passenger train service between Montclair and Hoboken, making three round trips daily. The locomotive equipment consisted of a normally closed electric circuit including a storage battery, a contact shoe and circuit breaker mounted on the right hand side of the forward tender truck, an electro-pneumatic valve installed in a branch of the brake pipe, provided with a cut-out cock, and a knife switch for cutting out the battery when tests were not being made; the speed-control feature of the system comprised a branch circuit, normally open at a push button installed in the cab as well as at speed-control contacts of the contact-shoe circuit breaker.

In normal operation, the local circuit on the locomotive is intended to be broken by lateral deflection of the contact shoe, caused by engaging a ramp; if the block section ahead is clear the ramp completes an electric circuit from the battery at the signal location to the valve magnet on the locomotive, the valve thereby being maintained closed. If the block section ahead is occupied, the polarity of the ramp circuit is reversed and therefore opposite to that of the engine circuit, and the valve magnet is de-energized, causing an application of the brakes.

The operation of the speed-control feature of the system is dependent upon the action of an unbalanced wheel or cam forming part of the contact-shoe circuit breaker. The cam carries a contact spring (115) which, upon deflection of

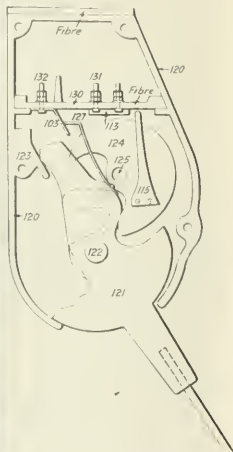


Fig. 1—Circuit Controller Box; Cover Removed Fig. 1a—Circuit-Control Apparatus

orable, although so far as concerns meeting the conditions of a severe winter climate, it is stated that the winter weather experienced with these tests was comparatively mild; but concerning the speed-control apparatus no positive opinion is given, the mechanical construction of this part having been crude and the records available being too meager to warrant any conclusion as to the practical utility of the device.

The track equipment of the installation which was tested included five contact rails or ramps, a stop ramp being installed in connection with signal M-66, and both a caution and a stop ramp being installed in connection with signals M-62 and M-56. The ramps were mounted on brackets attached to the right-hand track rail. The circuits were so arranged that both the caution and the stop ramps in one block were energized from a battery at the signal location when the block ahead was clear, and de-energized when the block ahead was occupied. Provision was also made in the circuits for the detection of the removal or displacement of a ramp. The difference between caution and stop ramps resided in the angle at the entering end, the caution ramp be-



Fig. 2—Contact Bar After a Snowstorm—Looking to the Rear

the contact shoe while passing through a ramp, engages another contact spring (113) mounted on an insulated block in the upper part of the housing, closing one of the open points in the speed-control branch of the locomotive circuits. If the rate of speed is below certain points (predetermined for both caution and stop ramps), say, 12 or 14 miles for caution ramps and 7 or 8 miles for stop ramps, the cam is not intended to complete its entire stroke but to be moved only into position to close the contacts (113 and 115), and maintain that point closed as long as the shoe is in engagement with the ramp. Under these conditions the branch circuit

may be completed by closing the engineer's push button in the cab, and the valve magnet is thereby maintained energized while passing a de-energized ramp. In case the speed is above the predetermined rate, however, the sharper and more abrupt deflection of the contact shoe, resulting from the higher rate of speed, is intended to impart sufficient momentum to the cam to throw it over its center, allowing it to complete its stroke. In this case the speed-control contact (113-115) is closed only momentarily and is broken again as the cam passes over its center and completes its stroke, the contact point being held open during practically the entire time the shoe is in engagement with the ramp and being restored to normal position again by the action of the shoe returning to normal position when it has passed out of engagement with the ramp. Under these conditions, the branch circuit being open at the speed-control contacts in the shoe circuit breaker, the engineman is unable to maintain the valve magnet energized by closing the push button, and he is, therefore, not able to pass a de-energized ramp above the predetermined rate of speed without receiving an automatic application of the train brakes.

The ramp is mounted in brackets clamped to the base of the track rail and held in normal position by coil springs forming a part of the rail clamps; the ramps are intended to



Fig. 2a—Contact Bar; Later Design—Looking Forward

be depressed by a snow plow, or other extra wide car and are then intended to be automatically restored to normal position by the coil springs. A circuit breaker is provided at each end of the ramp, through which the electrical connections are made, and the ramp circuit is broken whenever the ramp is depressed, not being restored until the ramp is returned to normal position.

In the circuit from the track relay to the ramp there are line relays to detect the removal or displacement of a ramp, and slow acting relays to prevent the track relays from opening when the direction of current flow in the ramp circuits is being reversed. In case a ramp should be torn out or displaced sufficiently to open one of the circuit breakers on either end, the circuit for the line relay at the location immediately in rear would be broken, and in consequence the line relay, the slow acting relay, and the track relay at that location would be de-energized, setting the signal at that location at stop and de-energizing the ramps controlled thereby.

The ramps are made of two overlapping angle-iron sections. At each end there is a throat about 5 in. in width and the engine shoe entering the ramp spreads apart the two overlapping sections which are normally held together by U-shaped springs, electrical contact being made on both

sides of the shoe with the edges of the angle iron sections. The engine shoe is deflected toward the track for a distance of 5 in.; the angle at the entering end of a caution ramp is such that this lateral movement of the shoe is accomplished when the shoe has traveled a distance of 60 in. from the point of initial engagement, and on a stop ramp about 32 in.

The speed-control branch of the engine circuits consists of wire 109, Fig. 3, leading from positive side of battery to engineer's push button, normally open; wire 111, contact 113, normally open, contact spring 115, which is permanently connected to the engine shoe, and thence through the shoe, wire 105, knife switch, wire 107, valve magnet, to ground.

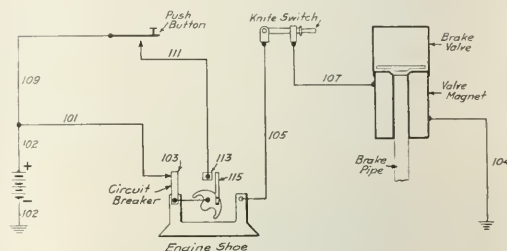


Fig. 3—Circuits on Engine

When the contact shoe is deflected upon engagement with a ramp, the cam carrying contact strip 115 is rotated about the stud upon which it is mounted, closing contact 113-115; if the rate of speed is below the speed-control limit this contact is maintained closed as long as the engine shoe is in engagement with the ramp, and if the engineer's push button is held closed the valve magnet is maintained energized, even though the ramp is de-energized. If, however, the rate of speed is above the speed-control limit, on account of the inertia of the cam and the greater force resulting from the impact between contact shoe and ramp, the cam is thrown over its center and the contact finger 115 is carried past the segment 113; the contact is therefore closed only for the instant the cam is rotating, and it is immediately broken and

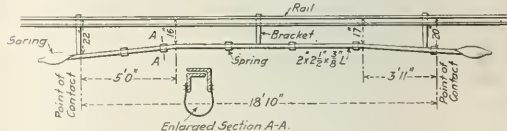


Fig. 4—Plan of Contact Bar

held open as long as the contact shoe is in engagement with the ramp. The speed-control branch of the engine circuits is therefore open at the shoe circuit breaker whenever the rate of speed of a train while passing a ramp is above the predetermined speed-control limit. The contact segment 113 is curved and so arranged that on the return movement of the cam the contact finger does not engage the face of the segment 113, but passes on the opposite side and does not make electrical contact except for a very brief instant when the engine shoe is being restored to normal position, at the last of the return stroke.

The contact shoe is made up of a bar of iron, 2 in. by 3/8 in. by 19 1/2 in. Pointed ends are provided to cut a path through ice or hard-packed snow. In its normal position the arm is inclined about 30 deg. from the vertical and its lower edge is about 20 in. from the gage side and about 3 1/2 in. above the top of the rail. When the arm passes through a ramp it is deflected toward the track and toward vertical

position, the movement of its lower edge being about 5 in. This apparatus is attached to the rear journal box on the right side of the forward tender truck and is insulated from it. When a ramp is engaged, the upper end of the arm is deflected toward the vertical, more or less violently, and the cam, by contact with the edge shown by dotted lines, Fig. 1a, is rotated to the left. Spring 127 breaks its contact, and contact is made between springs 115 and 113, to the latter of which wire 111 is attached. Spring 115 passes back of spring 113, being in contact with it for the whole distance. If the engagement with a ramp is at less than the predetermined limit of speed, the blow is not violent enough to give cam 124 sufficient momentum to carry spring 115 off from spring 113.

The magnet valve is an electro-pneumatic valve having a resistance of approximately 16 ohms. The connection with the brake pipe is made between the engineer's brake valve and the double-heading cock and consists of a $\frac{3}{4}$ -in. pipe, which leads directly to the magnet valve; in service an angle

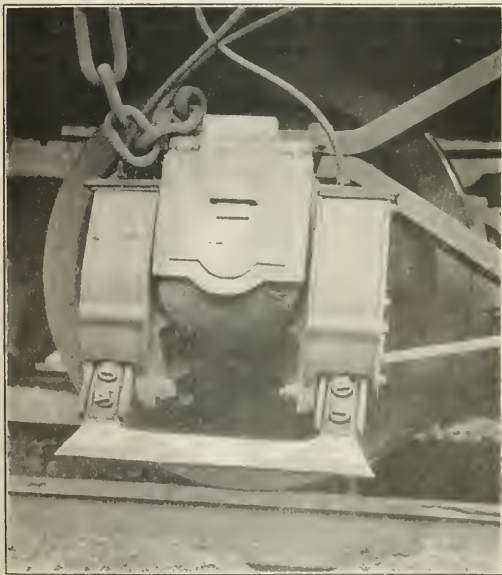


Fig. 5—Shoe

cock in this pipe connection is intended to be sealed in open position.

The magnet armature consists of a circular metal disk, carrying a ball which fits into a valve seat in the end of the brake-pipe connection which leads through the magnet core; the ball also serves to hold the armature away from the coil, and its position is adjustable.

TESTS

In January the apparatus was tested 248 times, of which 158 tests were made with ramps de-energized. Of these last, five were failures. The cause of failure was obscure, but it is believed to have been due to a loose or defective stud in the circuit-breaker box. In February the apparatus was overhauled and adjusted and in March and April 632 tests were made, two-thirds of which were carried out with the ramps de-energized. Of these, four were classed as failures. Three of the four were non-dangerous, but the fourth, in which the magnet valve failed to open when it should have opened, is reported as unexplained. A number of tests were

carried out under sleet and snow conditions, and on two cold days water was sprinkled on the ramps to make a coating of ice. Proper electrical contact was made in all of these tests.

Three pages of the report are devoted to a discussion of the failures. The apparatus was rather crude and there was one block signal failure while the tests were being made; but the final conclusion is that, except as noted in connection with the speed control feature, the system operates well.

As to the speed control feature, Dr. Wooding had not made sufficiently detailed preliminary tests, and the government inspectors had to determine for themselves the speed limit which should be employed; and the tests with this particular feature were conducted near the end of the trial season and were not numerous. The report says that in all of these speed control tests, ranging from 12 miles an hour to 59 miles an hour, the brakes were applied properly and the train was brought to a stop without unduly severe shocks.

In all other tests the brake-applying apparatus was controlled so as not to go into operation, the trains on this section of the road being so frequent that no risk of delay could be tolerated.

The report, in conclusion, says:

"The design of the electric circuits is fundamentally sound. * * *

"The forms of contact shoe and ramp provide good electrical contact, which was not interfered with by snow and ice under the comparatively mild winter-weather conditions surrounding the tests, and there was a notable lack of shock or vibration upon engagement of contact shoe and ramps.

"If properly constructed and installed the automatic-stop apparatus could, no doubt, be developed to meet the needs of any railroad company desiring to employ an automatic train-stop system of the ramp type.

"The mechanical construction of the speed-control apparatus employed in the tests was so crude, and the records of its operation at the low, critical speeds are so meager, that no positive opinion can be arrived at concerning the practical utility of this form of speed-control device or the principles embodied therein."

CHINESE RAILROAD CONSTRUCTION.—The projected Chuchow-Chincow line, now being surveyed by American and Chinese engineers, will run in a southwesterly direction from Hengchow, in Hunan, tunneling the Hsiangfei Mountains east of Kiyang to reach Yungchow, Hingan, Lingchuan, Kweilin, Yungfu, Loyung, and Yanchow, a busy port 100 miles west of Pakhoi on the Gulf of Tongking. The estimated distance is 700 miles and the cost of construction \$50,000 per mile.

LORD NORTHCLIFFE ON GOVERNMENT OWNERSHIP.—"During the war, many types of industry in England have been partly or entirely socialized. Whether these will be restored to private control after peace comes is an interesting question," says a writer in *Printers' Ink* who was fortunate enough to secure an interview with Lord Northcliffe at his offices in New York. "In a good many cases, government control will undoubtedly be continued," his Lordship admitted, says the interviewer. "However, industries which were efficiently managed under private control before the war will doubtless go back to their owners. For instance, English railways were, on the whole, well and efficiently handled before the war by the railway companies, and will doubtless go back to them at the conclusion of hostilities. Their greatest weakness, in ante-bellum days, was in their handling of freight, and the government has taught them a lesson of expedition and foresight during the war conditions of complete government control, which they will not soon forget."

FURTHER DATA ON THE ROGERS PASS TUNNEL

Further light on the considerations effecting the use of a pioneer tunnel in driving the Rogers Pass, or what is now known as the Connaught tunnel of the Canadian Pacific, was given recently by J. G. Sullivan, chief engineer of the Canadian Pacific Lines West, in a written discussion of a paper describing this tunnel presented before the American Society of Civil Engineers by A. C. Dennis, who was associated with the contractor on this work. In answer to previous discussion in which questions were raised as to the economy of the pioneer tunnel, since it involves rock excavation that forms no part of the completed tunnel, Mr. Sullivan gave a comparison between the estimated economics upon which the pioneer tunnel scheme was adopted and the actual savings secured. In the estimates he assumed that the pioneer tunnel could be driven from 20 to 25 ft. per day at a cost of \$30 per lin. ft., as this was the only part of the work that would be done under high pressure, the heading in the tunnel proper could be taken out at least \$5 cheaper than if done at high speed, while the bench, containing 18 cu. yd. per foot, because of the absence of interruptions waiting for drilling or cleaning up to put in breast holes or knocking down material to get pipes into the heading, could be taken out for 75 cents per cu. yd. cheaper. On this basis, it was estimated that the tunnel section would be excavated for \$18.50 less, leaving \$11.50 to be taken care of in the interest saved, because of the shorter time required to complete the tunnel.

As actually carried out, the pioneer tunnels cost about \$28 per lineal foot, instead of \$30, while the saving in the enlargement of the tunnel section was much more than 75 cents per cu. yd. Summing up, the cost of driving this main tunnel through rock, including in this the cost of driving 19,610 lin. ft. of pioneer tunnel, 12 cross cuts, each about 40 ft. long, erecting the plant (including freight), the proportionate cost of building about five miles of temporary railway tracks and other overhead charges, plus 10 per cent on all expenditures, will amount to a little less than \$5 per cu. yd. of excavation in the tunnel proper.

In answer to statements that the method would not be applicable where there are soft spots in the rock, he expressed his confidence that the method would prove more economical than any other which has been tried where the soft rock encountered would not exceed 50 per cent of the total.

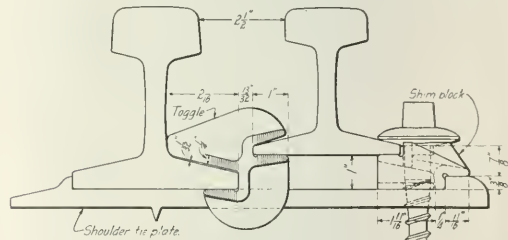
Mr. Sullivan also made some interesting comments on the selection of the location of the original line over Rogers pass in place of a line around the loop of the Columbia river from Beavermouth to Revelstoke, a location seriously considered when the Canadian Pacific was extended to the coast originally: "The distance around by the Columbia river, from Beavermouth to Revelstoke, is 163 miles, 96 miles longer than the line located by Major Rogers, and for the traffic carried in 1912 and 1913, when the question of double-tracking and revising the line was being studied, it was seriously proposed to abandon the Rogers pass route and build by way of the Columbia river, as almost enough could be saved in the cost of operation on this longer line to pay the interest on the construction of the new line, and a great deal more than the difference in the cost of the two lines, had the company been fortunate enough to build around there in the first place. Nevertheless, the company is now thankful to Major Rogers, for had it originally built the line around by way of the Columbia river, the writer is sure that it would never have been abandoned for the present line, which, with the tunnel and heavy business, is more economical, especially in time, than operating the longer distance by way of the Columbia river. The company should be especially thankful to Sammy Sykes, the locating engineer, who was responsible for the "loops" on the west slope of the Selkirk mountains, inasmuch as the original location ran straight down the

north bank of the Illicillewaet, where, to this day, signs of some abandoned construction work can be seen, but, in order to save money at the expense of distance, Mr. Sykes put in the "loops." The result of introducing these "loops" brought the constructed line into the valley of the Illicillewaet, very close to the west portal of the tunnel.

"These, the writer thinks, are two instances which illustrate the fact that it is never safe to be too sure in a criticism. Here are two cases which could be looked on as blunders, as the increased cost of operation, in the one case on account of the heavy grades and the large rise to be overcome, and in the other case operating over the longer distance of line without improvement in grades, with a reasonable volume of traffic would be greater than the interest on the money that was saved in construction, but which really turned out to be a benefit rather than otherwise."

NEW GUARD RAIL ATTACHMENTS

The cross section illustrates a new device for securing guard rails on curves. In this design the main and guard rails are supported on tie plates having shoulders at each end. By means of small malleable iron pedestals or shims placed under the far edge of the guard rail, together with toggles having



Cross Section Through the Main and Guard Rails

jaws to engage the adjoining flanges of the main and guard rails, a guard rail of lighter section than the main rail can be raised to any desired height. The toggles are placed in the spaces between the ties, and in addition to acting as supports for the guard rail, they serve to hold it against over-



The Guard Rail Fastenings Installed in Track

turning, as the turning moment is resisted by the weight carried on the main rail. In combination with the cast iron shims which are held in position by screw spikes, these toggles definitely fix the flangeway between the heads of the main and guard rails.

The device is simple of application and has the advantage that the guard rail may be changed at any time without disturbing the main rail or the tie plates, and rails of much lighter section than the main rails can be used as guard rails on curves. By using different size toggles and shims any combination of main and guard rails may be utilized and, if desired, a variation in the relative height of the shim block and of the vertical distance between the jaws of the toggles will permit changing the guard rail as much as may be deemed necessary.

The device has been in use in several places on the Louisville & Nashville. One installation on an 18½ deg. curve has been in service since February, 1916, on track subjected to a heavy transfer traffic handled by large locomotives. It is reported that no breakages have occurred in any of the parts, and that the track is free from noise and rattle, while the flangeway remains the same as when installed, except for such wear as has taken place in the head of the guard rail. The device has been patented by Thomas Maney, Louisville, Ky., until recently general roadmaster of the Louisville & Nashville.

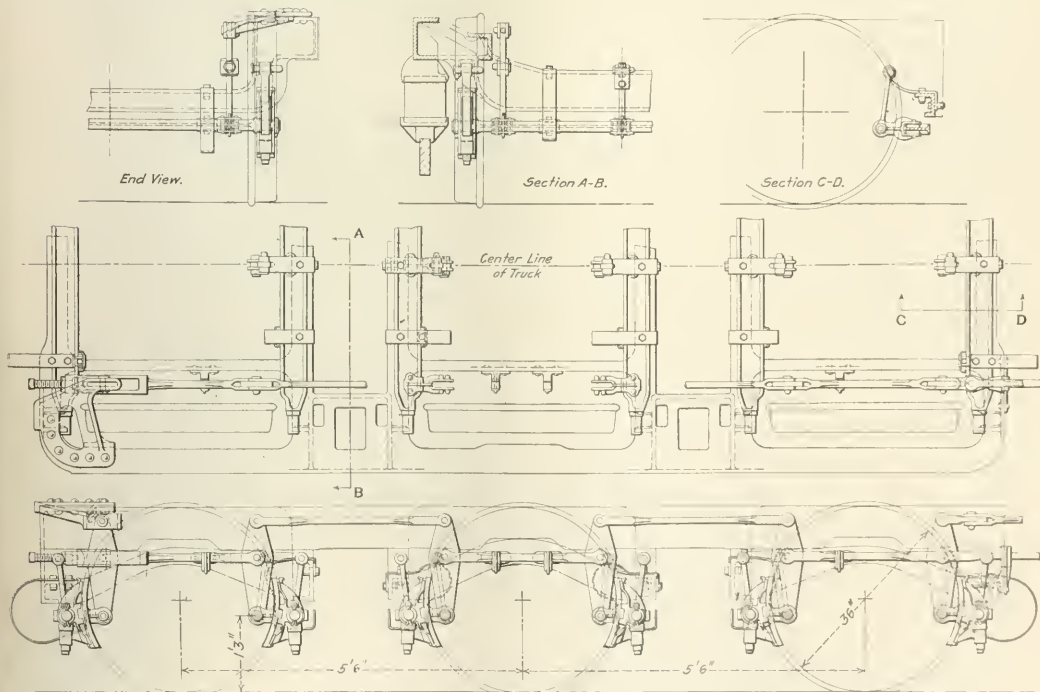
SIMPLEX CLASP BRAKE

A clasp brake adapted for use on either four-wheel or six-wheel passenger car trucks is being manufactured by the American Steel Foundries. The design has been worked out with a view to providing a truck foundation brake gear

nected to one another through pull rods and to the brake beams through fulcrum jaws. The brake beams, which are suspended close to the horizontal center line of the wheels, are straight drop forged members of an I-section, with cylindrical brake head trunnions at both ends. Brake hangers pivoted to the truck frame on both sides support the brake beams at the heads. The brake beams have a third point of support at the center where a fulcrum jaw is fastened. This is connected to a swing hanger suspended from a spring steel bracket bolted to the truck frame. The brake beams in turn support the levers and thus all movement and support of the rigging is taken care of by swing hangers.

The adjustable brakeheads, which are mounted on the trunnions, are of a special design to give the maximum space for changing shoes, at the same time affording ample clearance between the brake beams and the flanges of the wheels. Bearings for the release springs are fastened to the brake beams to prevent chafing of the beams. Adjusting screws are provided at the outer ends of the truck and give sufficient movement to adjust the entire rigging, which is necessary only when variations are made in the diameter of the wheels. All moving connections are case-hardened to keep the lost motion in the rigging to a minimum.

The type of construction used in the Simplex clasp brake produces an even distribution of forces on all shoes. Inertia has been reduced by providing the most direct method of transmitting braking force and by keeping the weight of the parts as low as possible consistent with strength. Friction



Arrangement of the Simplex Clasp Brake

that would perform its function in the most efficient manner without sacrificing simplicity, strength and economy of maintenance.

The brake rigging as applied to the truck consists of a double system of vertical levers just inside the wheels, con-

has been minimized by the swing hanger method of support. Since the rods all pass over some part of the truck it is practically impossible for any parts of the rigging to fall to the track. The design has been thoroughly tested by the American Steel Foundries and is in extensive use.

General News Department

Traffic through the Panama Canal has now been uninterrupted by slides for one year, the last obstruction having been cleared September 7, 1916. The canal was opened for traffic on August 15, 1914.

The Boston & Albany, following protracted negotiations, has advanced the pay of track foremen 8 per cent, which is about half of what had been demanded. Laborers will have their pay advanced from \$2.10 a day to \$2.15.

The Alton & Jacksonville, a 21-mile road running out of Alton, Ill., has filed a petition with the Illinois State Public Utilities Commission asking permission to dismantle the line, dispose of its holdings and retire from business.

The United States Civil Service Commission announces examinations October 3 for the position of tariff clerk for the Interstate Commerce Commission; salary, \$1,200 a year. Applicants must be male and over 18 years of age.

Three railroads, the Southern, the Georgia, Florida & Alabama and the Gainesville & Midland, have applied to the Georgia Railroad Commission for authority to disregard those sections of the state law which prohibit the operation of freight trains on Sunday.

The Canadian Pacific, following protracted negotiations, has advanced the pay of the locomotive enginemen and firemen on its western lines, the increases to date from August 1. It is said that the men on passenger trains will receive an advance of about 9 per cent, and those on freight trains 5 per cent. The new agreement provides for the eight-hour day.

The New York Central has temporarily suspended the rule under which all employees reaching the age of 70 years are to be retired on pension, and those not physically unfit will be retained in the service. Former employees, now retired on pension, who are physically able and competent to perform some work, will be re-employed, temporarily, if they so desire.

A law was passed at the recent session of the Indiana legislature which requires that a township wagon or conveyance used for the purpose of carrying children to and from school shall be brought to a full stop at steam or electric railway crossings, and some responsible occupant of the vehicle must walk ahead and ascertain whether the tracks are clear before the vehicle may cross the tracks.

In court at Bluefield, W. Va., on September 6, G. A. Smith was awarded damages of \$15,921 against the Brotherhood of Locomotive Engineers for having expelled him from the brotherhood. Smith had sued for \$50,000, and the award is said to have been based on his expectation of life and on the amount of the insurance policy which he had held in the brotherhood. The brotherhood will appeal to a higher court.

Mrs. Ralph Peters, wife of the president of the Long Island Railroad is in charge of a plan whereby a group of Long Island women will erect and equip five "hostess houses" for the men at Camp Upton, the National army cantonment at Yaphank, L. I. One will be for officers and four for privates. The houses will be used as meeting places for officers, soldiers and their relatives who visit them. A restaurant will be installed in each house, and food will be served visitors at cost.

Employees of the Chicago, Milwaukee & St. Paul, drawn from its various offices in Chicago, were recently sworn into the Eleventh National Guard regiment of Illinois. The St. Paul men constitute a separate company under the leadership of J. Welch, captain, who is assistant general auditor of the road. The company is now in training at Springfield, Ill., and is one of many recently formed as home guard forces to take the place of militia regiments which are preparing to go to France. A. H. Davies, chief inspector of demurrage of the St. Paul at Chicago, is now organizing a supply company of St. Paul employees for the same regiment.

The New York Central has opened telegraph schools at Utica, N. Y., and Rochester, N. Y., for the instruction of students in telegraphy and in the operation of block signals. There have been approximately 80 applications for enrollment to date. An entrance fee of \$2 is charged, and thereafter a monthly tuition fee of \$1. The money is refunded to students who complete the course and who enter the service of the railroad company. A similar school has been operated at Albany, N. Y., for a number of years.

The State Corporation Commission of Virginia has imposed on the Southern Railway a fine of \$500 for having granted free passes to officers of the state. Such action is declared to be in violation of the constitution and laws of the state. The trial of the case brought out a copy of a letter in which the railway company had sent an annual pass, good over certain divisions, to a county sheriff, the terms of the accompanying letter constituting a contract by which the pass was to be deemed full payment for services performed by the sheriff for the railway or in connection with suits brought by or against the railway.

Western Railway Club Meeting

The Western Railway Club will hold the first meeting of the winter season on September 17, at the Hotel Sherman, Chicago. E. Vanamaker, electrical engineer of the Rock Island Lines, will present a paper on "War and Welding."

Railway Returns for September

The Interstate Commerce Commission's partial summary of railway revenues and expenses for September, covering the operations of 203,621 miles of road, shows an increase in operating revenues from \$1,300 to \$1,488 per mile of line, an increase in expenses from \$837 to \$1,013 and an increase in net operating revenues from \$463 to \$475. For the seven months of the year the report shows an increase in revenues from \$8,579 to \$9,585, an increase in expenses from \$5,732 to \$6,774, and a decrease in net revenue from \$2,847 to \$2,811.

Soft-Coal Output Lower

The Geological Survey, Department of the Interior, authorizes the following:

A direct measure of the serious effect of labor trouble is furnished by the statistics of bituminous coal production for the week ended August 18. In this week by reason of strikes in Illinois and the Southern Appalachians the ratio of tonnage produced to full-time capacity, as limited by present labor supply, was lowered for the country from 71.8 per cent to 62.5 per cent. In the districts directly affected the reductions were in Illinois from 70.3 per cent to 54.8 per cent and in eastern Kentucky and Tennessee from 74.2 to 10.8. Conditions in Iowa, Indiana and Ohio improved slightly, and the output percentage in western Pennsylvania declined from 78.2 to 69.4.

Seeks Data on Best Methods of Shipping Food Products

To determine the best ways of shipping, handling and transporting food products to avoid injury from unfavorable temperatures or other injurious weather conditions, the United States Weather Bureau recently has solicited the help of persons engaged in such work in compiling a manual of protective methods. Information is desired as to the best type of containers for various products; the methods of handling and packing; the most efficient types of cars for use during hot and cold weather; devices for cooling, heating and ventilating the same, and special precautions to be taken with particular classes of goods; housing of cars to secure additional protection en route or at terminals; railroad inspection of perishables and cars, and accuracy of thermometers used; kinds of heaters and advantages and disadvantages; icing requirements and regulations; protective value of wrapping paper; acceptance regulations as to low or high tem-

perature limits; best form of waybill to secure attention en route and at terminals; salvage or restoration processes; protective methods to and from depots or cars on track; and suggestions as to Weather Bureau service to meet the requirements of shipper, merchant and carrier.

Strike of Mechanics on Boston & Maine Ended

The strike of mechanics on the Boston & Maine was officially declared off Monday, and the 3,300 men involved are back in their places. An agreement was reached late Saturday night at a conference between the strikers, the railroad officers and the Massachusetts Committee on Public Safety.

Both the union and the railroad agreed that the wages be raised five cents an hour, provided the men return to work at once. The men asked for eight cents an hour, and the remaining three cents will be submitted to an arbitration for decision. Henry B. Endicott, executive manager of the Public Safety Committee, was chosen the sole arbitrator.

Freight Claim Record on Salt Lake Route

According to a recent announcement by H. C. Nutt, general manager of the Los Angeles & Salt Lake, that company has made substantial reductions in the ratio of loss and damage payments to gross freight revenues in the past decade. In the fiscal year 1909-1910, these payments constituted 2 per cent of the gross freight revenues, and in each subsequent year up to 1915 the ratio had been reduced to one per cent. In the fiscal year 1915-1916 it had been reduced to 0.64 per cent, in the last six months of 1916 to 0.46 per cent, and in the first six months of 1917 to 0.38 per cent; and this in face of the rising value of the commodities carried, which means higher claims for losses. This increased efficiency in stopping freight claim leaks has been due to the hearty co-operation of officers and employees to that end, working through the medium of safety and efficiency committees.

Liberty Bond Posters

Fairfax Harrison, chairman of the Railroads' War Board, has addressed a bulletin to the railroads stating that the Treasury Department of the United States has requested the railroads to permit the placing of a poster for the second Liberty loan in the waiting room of every railroad station in the United States, and a Liberty loan text book furnishing authoritative information regarding the loan in the hands of each station agent in the United States. The posters contemplated will be 36 in. by 48 in., lithographed in six colors, and are now in preparation. It is recommended to the railroads that the placing of the posters be permitted, and it is suggested that the proper officer on each railroad write direct to Oscar A. Price, director of publicity, Treasury Department, Washington, D. C., advising the number of posters necessary for its use and to whom they shall be sent.

Loss of Live Stock on Right of Way

The International & Great Northern has issued a general order under date of September 1 for distribution among officers, employees and patrons of the road, pointing to the economic loss in live stock killed on the right of way, and urging everybody to do all that can be done to reduce this waste. In the last fiscal year there were killed on the International & Great Northern 671 head of cattle, 474 hogs and sheep, and 153 horses and mules.

The general manager has also sent specific suggestions to the division superintendents, as follows: 1, owners of stock should keep their animals in fenced enclosures and should not permit their stock to roam at large on the railroad right of way; 2, superintendents, assistant superintendents, trainmasters, roadmasters, stock claim agents, station agents and section foremen should make personal appeals to the owners of stock to keep their animals in fenced enclosures; 3, enginemen should be impressed with the fact that it is very necessary that every precaution be taken within their power to avoid striking stock, and under no circumstances must they fail to report stock struck or seen on the right of way; 4, section foremen should keep stock off the right of way, farm gates closed and fences and cattle guards in good repair, giving preference to locations where the liability of stock getting on the track is greatest; 5, superintend-

ents should get in touch with newspaper editors to present this important matter to the public through the press.

Strike of Freight Handlers at Kansas City

A strike of the freight handlers called last week at Kansas City, Mo., has affected practically all of the lines entering that point. Three of the roads, the Atchafalaya, Topeka & Santa Fe, the Chicago, Burlington & Quincy and the St. Louis-San Francisco, are reported as having almost their entire forces at work again. The Chicago, Rock Island & Pacific was closed Monday and a small force was put to work Tuesday morning. Most of the other lines closed entirely and there have been no disturbances of any kind. The chief demand of the men is recognition of their union, an increase of from 25 to 35 per cent in wages, an eight-hour day, a six-day week and time and a half for overtime. Employees of packing houses at Kansas City are also out on a strike and indications are that men in other industries will join in a sort of general walkout. Authorities have not determined whether the conditions are due to German influences or to I. W. W. propaganda.

U. S. Chamber of Commerce Referendum on Railroad Regulation

The Chamber of Commerce of the United States has sent out to its members ballots for a referendum vote expressing the opinion of its members on four recommendations of the chamber's railroad committee on questions of railroad regulation, as follows:

1. That provision be made for federal regulation of the issuance of railroad securities.
2. That Congress pass a general railroad incorporation law under which all railroad carriers subject to the jurisdiction of the Interstate Commerce Commission may organize.
3. That if Congress passes a railroad incorporation law, all railroad carriers subject to the jurisdiction of the Interstate Commerce Commission, both those now existing and those hereafter to be created, be required to organize under this law.
4. In view of the fact that conflict has arisen with respect to the jurisdiction of the Interstate Commerce Commission over intrastate rates, even though such rates affect interstate commerce, the committee recommends that the commission be given authority by statute to regulate intrastate rates when those rates affect interstate commerce.

Railway Accidents in Great Britain in 1916

The British Board of Trade has issued its annual report on railway accidents for the last calendar year, and it is a pamphlet of only six pages, this reduction from the usual 60 or 70 pages having been made to economize printing and paper. And, besides this economy, the office records have been reduced in volume by an order relieving the railroads from reporting some of the less important accidents.

Three passengers, twelve employees and one other person were killed by train accidents during the year, and 350 passengers, 182 employees and 17 other persons were injured. In the preceding year the number of passengers killed in train accidents was 269, that record having included the disaster at Quintinshill, where 224 soldiers were killed. The average number of passengers killed in train accidents yearly during the ten years preceding 1915, was 21. Adding accidents due to other causes, mostly the victims' own fault, and including also those where no train movement was concerned, the totals for 1916 were 156 passengers, 441 employees and 453 other persons were killed and a total (all three classes) injured, of 5,589. The total killed, all classes, 1,066, was 88 less than the average total for the ten years preceding 1915. The total number of injuries reported last year, 5,589, is very far below all earlier records for the reason that in 1916 the railways were not required to report non-fatal accidents to employees, where the movement of trains was not concerned. In 1915 this class included 59 killed and 21,202 injured. This last number indicates the extent of the relief to the clerical staffs of the railway companies by the suspension, during 1916, of the usual reporting requirements. Of the employees killed in 1916 under this head, only four were trackmen. The number of trespassers killed in the United Kingdom last year, 310, is 54 less than in 1915 and 142 less than the average yearly number in the preceding ten years.

REVENUES AND EXPENSES OF RAILWAYS

TH OF TIME. 191

Name of road.	Average mileage carried during period.	Operating revenues.			Maintenance of way and structures.			Operating expenses.			Net from railway.	Railway tax, income, etc.	Operating (or de cr., or incr., with comp. with other roads.)
		Freight.	Passenger.	Total.	Way and structures.	Equipment.	Traffic.	Trans- portation.	Miscel- lanous.	General.				Total.
Atlantic & St. Lawrence.	167	\$5,953	\$122,364	\$128,317	\$47,151	\$43,738	1,416	169,649	\$8,013	\$189,493	\$67,128	\$179,936	—
Central Vermont.	167	5,953	122,364	128,317	47,151	43,738	1,416	169,649	8,013	189,493	867,128	1,779,936	—
Chicago, Detroit & Can. Grand Tr. Cen.	160	50,606	72,282	122,906	1,424	23,71	1,462	66,339	2,139	106,515	3,546	157,335	49,200
Detroit, Grand Haven & Milwaukee.	191	331,875	5,410	296,906	41,654	50,650	5,272	166,591	6,654	270,241	36,115	306,356	19,012
Grand Trunk Western.	151,283	699,616	151,283	936,100	116,207	140,227	15,483	336,613	4,654	341,267	97,633	438,900	2,053
Kansas City, Mexico & Orient.	272	75,772	14,028	93,139	16,666	24,969	5,493	42,715	5,276	48,991	5,178	54,169	6,096
SIX MONTHS OF CALENDAR YEAR. 1917													
Atlantic & St. Lawrence.	167	\$692,572	\$124,526	\$226,429	\$188,310	\$188,310	\$25,546	\$684,589	\$43,274	\$1,922,654	\$64,326	\$330,651	\$601,629
Central Vermont.	161	1,441,132	430,783	2,111,552	188,671	306,477	46,351	1,094,126	60,238	1,209,243	94,935	306,569	1,759,992
Chicago, Detroit & Can. Grand Tr. Cen.	160	1,231,307	77,550	1,626,278	209,850	257,733	31,722	917,544	34,115	1,529,518	111,038	21,720	388,473
Detroit, Grand Haven & Milwaukee.	191	3,582,816	728,283	4,693,101	519,362	841,205	95,161	2,100,745	35,475	3,710,835	982,276	23,410	7,830,332
Kansas City, Mexico & Orient.	272	461,427	65,115	555,946	94,456	163,546	32,748	268,447	35,677	594,873	38,928	36,060	657,099

SIX MONTHS OF CALENDAR YEAR. 1911.

167	\$692,572	\$124,526	\$226,499	\$250,095	\$188,330	\$25,546	\$684,590	\$45,374	\$1,192,654	\$566,235	\$64,126	-\$130,061
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TH OF JULY. 1917

Name of road.	Average mileage during period.	Operating revenues			Maintenance of way and structures		Operating expenses			Net operating ratio.	Railway tax accruals.	Increase (or decrease) in comp. with last year.
		Freight.	Passenger.	(inc. misc.)	Total	Way and structures.	Equip- ment.	Traffic.	Trans- portation.				General.
Alabama & Vicksburg.....	143	\$115,976	\$42,340	\$168,095	\$24,703	\$26,156	\$4,453	\$32,801	\$1,889	\$35,690	\$6,979	\$4,415
Alabama Great Southern.....	143	111,417	55,869	167,286	22,703	22,703	\$2,407	25,110	67.59	27,787	3,519	19,571
Albany & West Point.....	640	8,267,191	4,592,597	12,860,000	1,267,785	1,833,825	185,042	3,403,491	10,378	4,697,873	592,333	365,259
Albany & West Point.....	640	60,326	55,579	115,906	15,602	26,418	5,021	43,931	71.83	38,304	7,748	36,473
Atlanta, Birmingham & Atlantic.....	640	14,168	58,929	73,093	51,078	57,601	14,910	145,130	85.42	37,522	17,000	33,097
Atlantic & St. Lawrence.....	167	81,226	31,961	113,187	43,852	63,747	58,951	1,900,972	80.06	626,339	300,000	435,171
Atlantic Coast & Georgia Terminal.....	479	2,183,074	780,562	2,963,636	263,479	335,747	87,524	2,151,416	84.06	2,337,940	213,660	17,297
Baltimore, Chesapeake & Atlantic.....	88	95,616	154,535	250,151	53,025	35,047	1,809	83,127	84.45	14,012	2,634	21,958
Bangor & Aroostook.....	632	173,859	71,991	245,850	50,378	62,928	5,489	89,534	12.09	224,402	15,000	30,250
Bessemer & Lake Erie.....	205	1,487,653	40,932	1,528,585	249,177	16,235	400,734	34,316	87.50	45,281	25,000	19,607
Boston & Garfield.....	46	275,538	4,811	280,349	23,589	23,589	1,832	48,767	37.97	91,569	23,725	30,359
Boston & Maine.....	2,305	2,986,587	1,650,887	4,637,474	656,771	491,193	2,478,164	112,638	3,891,138	96.37	3,446	1,085
Buffalo, Rochester & Pittsburgh.....	587	1,199,241	126,783	1,326,024	233,849	37,604	28,448	44,486	6.589	115,516	31,185	26,435
Canadian Pacific Lines in Maine.....	234	70,159	36,658	106,817	34,436	34,136	19,215	50,334	29.38	1,031,142	43,000	33,473
Carrollton, Cincinnati & Chicago.....	218	360,311	15,562	375,873	15,523	15,523	7,762	13,065	63.19	111,489	13,400	98,089
Central of Georgia.....	1,919	857,463	366,142	1,243,540	197,381	230,870	38,259	434,224	35.611	947,374	70.57	395,167
Central of New Jersey.....	684	2,345,703	793,059	3,138,762	255,586	494,855	40,322	1,287,228	16.819	2,156,999	63.49	1,240,223
Central New England.....	301	377,353	36,565	426,116	64,912	34,737	11,991	158,833	37.90	177,135	20,246	37,018
Charleston & Western Carolina.....	243	334,434	57,939	392,373	61,905	34,713	61,905	1,577,766	63.71	1,589,090	19,500	132,378
Chesapeake & Ohio Lines.....	2,343	3,164,441	1,657,956	4,822,397	623,915	990,213	31,905	4,878,341	73.70	4,777,684	190,000	977,519
Chicago & Eastern Illinois.....	1,131	1,462,912	595,379	2,058,291	187,621	303,123	40,869	1,385,400	66.59	594,838	55,400	539,223
Chicago & Great Western.....	60	80,726	18,056	98,782	12,207	9,838	67,645	40,900	1,436,495	79.38	37,3854	124,218
Chicago, Detroit & Can. Grand Trk. Intn.....	8,108	6,187,653	2,239,195	9,427,440	1,394,317	1,527,039	110,256	3,446,719	79.27	2,747,211	3,546	2,159
Chicago, Burlington & Quincy.....	3,273	6,976,340	2,250,384	10,110,005	1,283,651	1,757,369	383,819	3,519,458	67.94	3,740,738	552,101	2,688,630
Chicago & Erie.....	1,200	673,333	33,119	706,452	127,568	192,391	35,451	500,233	69.49	337,069	31,275	215,774
Chicago & North Western.....	13	20,323	1,378,105	2,397,528	247,568	92,391	46					
Chicago Junction.....	10,280	7,072,111	1,996,844	10,195,754	980,633	1,657,299	149,670	3,971,126	74.51	434,438	4,298	39,140
Chicago, Milwaukee & St. Paul.....	255	25,887	165,577	217,47	32,600	35,400	57,51	5,984	146,012	68.25	3,718,104	590,135
Chicago, Peoria & St. Louis.....	479	202,507	59,940	262,449	31,350	39,449	18,062	72,021	76.91	9,922	13,207	8,123
Chicago, Rock Island & Gulf.....	479	202,507	59,940	262,449	31,350	39,449	18,062	72,021	76.91	9,922	13,207	8,123

$$\begin{array}{r} 31 \overline{) 350} \\ \underline{31} \\ 40 \\ \underline{36} \\ 40 \end{array}$$
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REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY, 1917.—CONTINUED

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY, 1917—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues—			Operating expenses—			Total.	Operating ratio.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decrease) last year.
		Freight.	Passenger.	Total (inc. misc.).	Traffic.	Trans-shipment.	General.						
St. Louis, Iron Mountain & Southern.....	9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Louis, Pacific Bridge Terminal.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Louis-San Francisco.....	4,761	\$3,701,154	1,368,217	4,855,413	599,716	745,908	811,776	18,763	818,553	72.46	1,825,593	1,620,781	115,011
Seaboard.....	3,461	1,401,313	514,228	1,915,541	284,715	402,782	686,005	836,933	70,919	441,767	112,500	3,270,818	600,336
Southern.....	6,983	4,761,896	1,858,486	7,269,592	919,610	1,245,027	155,942	836,933	70,913	2,263,615	382,257	1,881,814	600,336
Southern in Mississippi.....	278	61,308	28,433	89,741	12,240	19,199	4,911,905	37,57	79,973	80.61	9,550	9,649	9,284
Spokane, Portland & Seattle.....	7,555	8,410,500	1,888,064	10,298,564	1,449,927	821,168	4,153,069	13,085	286,977	45.11	557,735	580,909	365,109
Tennessee Central.....	295	39,472	138,757	178,229	22,536	27,690	51,248	6,605	112,773	81.27	35,984	21,165	17,008
Terminal R. R. Ass'n of St. Louis.....	37	.....	2,195	.....	51,795	26,156	999	957.22	4,987	141.27	15,294	15,294	.....
Texas & New Orleans.....	468	347,696	114,454	502,095	48,814	55,603	7,822	135,221	10,801	269,252	21,570	216,035	145,596
Texas & Pacific.....	1,436	1,077,105	465,588	1,542,693	192,337	273,158	4,001	282,305	1,433	378,892	190,000	367,887	33,903
Toledo & Ohio Central.....	248	677,105	41,008	791,687	133,545	8,071	1,517,795	11,670	1,517,795	64.77	275,892	275,892	.....
Toledo, Peoria & Western.....	248	57,309	34,696	98,788	18,792	26,997	2,138	43,077	5,033	96,036	97.21	28,752	7,604
Toledo, St. Louis & Western.....	455	577,911	36,304	644,513	87,369	66,816	17,737	219,583	9,012	400,297	20,000	224,198	74,757
Trinity & Brazos Valley.....	369	51,031	13,448	68,969	21,634	29,084	2,043	36,335	8,027	97,123	140.82	33,314	2,396
Texasarkana & Fort Smith.....	81	81,095	4,417	102,153	10,895	14,447	11,597	18,174	4,576	50,398	42,396	34,314	28,153
Union R. R. of Pennsylvania.....	3,652	4,683,974	1,068,411	5,953,388	45,976	73,072	956	287,592	10,457	1,700,685	27,7345	2,253,485	186,598
Union R. R. of Baltimore.....	8	113,559	35,209	151,045	.....	.....	.....	8,331	21,339	18,564	12.29	132,482	16,225
Vicksburg, Shreveport & Pacific.....	171	88,856	47,019	149,872	16,135	27,487	5,391	46,802	5,887	103,223	68.87	46,649	6,092
Virginian.....	513	793,647	36,925	877,013	37,013	118,927	6,059	216,428	14,183	442,557	39,000	421,903	146,971
Washington.....	36	71,743	502,165	573,908	32,340	47,477	1,279	1,366,124	3,759	1,069,932	109,881	931,986	34,675
West Jersey & Seashore.....	39	214,342	784,609	1,022,338	131,184	113,754	11,363	367,401	15,797	1,024,324	41,239	356,385	7,436
Western Maryland.....	67	1,032,236	1,088,982	2,130,044	238,443	330,004	32,303	371,041	27,828	844,185	67.44	394,797	20,702
Western Pacific.....	958	641,888	140,308	820,588	139,818	85,925	25,668	242,963	20,093	525,758	94.07	394,831	53,370
Western R. of Alabama.....	512	945,695	16,863	962,558	126,833	170,514	8,933	334,916	21,937	778,455	63.68	390,759	8,721
Wheeling & Lake Erie.....	1,382	1,156,594	57,425	1,100,618	246,371	246,371	231.06	505,055	36,270	1,081,837	73.35	360,690	26,039
Winnipeg & Mississippi Valley.....	1,382	1,156,594	251,022	1,474,860	278,039	246,371	231.06	505,055	36,270	1,081,837	73.35	360,690	26,039

* Merged with Missouri Pacific, June 1, 1917.

Will Burn Coal Instead of Oil

According to advices received by the Texas Railroad Commission, there is such a shortage of expert mechanics that the Southern Pacific and the Santa Fe are meeting delay in changing the fuel equipment of their locomotives from oil burners to coal burners. The purpose of going back to the use of coal is in order to conserve the crude oil supply for war purposes. The demand for mechanics is said to be the greatest ever known in the history of Texas. Thousands of these skilled artisans have left the state during the last several months to take employment in industrial plants in the North and East. The railroad shops have been largely depleted of this class of employees, and there is no source open by which to fill the existing demand for them.

The equipment of the Texas railroads will be taxed to its limit during the next few weeks. In addition to the regular traffic of cotton and the usual heavy fall shipments of grain and other farm products, the railroads are now being called upon to handle an unprecedentedly large troop movement. Besides the transportation of the soldiers for the new army to the different military camps in the state, large numbers of cars and engines will be required to handle the supplies necessary for their maintenance. The diverting by order of the Federal government of export shipments through the ports of Galveston, Port Arthur and Beaumont will also bring into use much additional equipment of the railroads.

The drought in the cattle section of Texas is causing an unprecedented demand for freight cars for the transportation of starving cattle to sections where water and grass are available. In many cases the railroads are utterly unable to supply these cars, and the loss of thousands of head of cattle badly needed to augment the nation's food supply may result.

Railway Revenues and Expenses, June, 1917

The net operating income of the railways of the United States for June, 1917, was more than for June, 1916, by \$32 per mile, or 8.1 per cent, according to the monthly bulletin of the Bureau of Railway Economics.

Total operating revenues, \$349,739,636, exceeded those for June, 1916, by \$49,720,256. Operating expenses, \$235,590,773, were greater by \$39,363,926. Net operating revenue, \$114,148,863, increased \$10,356,330. Taxes, \$16,567,481, increased by \$2,912,302. Net operating income was \$97,516,514, which is an increase of \$7,506,833.

If spread over the mileage represented, operating revenues average \$1,514 per mile, an increase over June, 1916, of 16.3 per cent; operating expenses per mile, \$1,020, were greater by 19.8 per cent; net operating revenue per mile, \$494, shows an increase of 9.8 per cent, while the net operating income per mile, \$422, increased 8.1 per cent. Taxes per mile rose 21.1 per cent.

This summary covers 231,035 miles of operated line, or about 90 per cent of the steam railway mileage of the United States.

For the Eastern railways, operating revenues per mile were greater than those for June, 1916, by 14.1 per cent; operating expenses rose 21.0 per cent; net operating revenue increased 0.4 per cent; taxes increased 14.1 per cent. Operating income per mile decreased 1.4 per cent.

For the railways of the Southern district, operating revenues per mile exceeded those for June, 1916, by 19.9 per cent; operating expenses rose 26.9 per cent; net operating revenue increased 6.7 per cent; taxes increased 38.1 per cent. Operating income per mile increased 2.0 per cent.

For the Western railways, operating revenues per mile exceeded those for June, 1916, by 17.9 per cent; operating expenses rose 16.1 per cent; net operating revenue increased 21.1 per cent; taxes increased 22.1 per cent. Operating income per mile increased 21.1 per cent.

The six months of the current calendar year, compared with the corresponding period of the preceding year, show changes per mile of line as follows: Operating revenues increased 11.6 per cent, operating expenses increased 17.7 per cent, net operating revenue decreased 1.4 per cent, taxes increased 16.3 per cent, while operating income decreased 4.2 per cent.

Operating income per mile decreased 19.8 per cent in the East, increased 2.6 per cent in the South, and increased 11.2 per cent in the West.

REVENUES AND EXPENSES OF STEAM ROADS—JUNE, 1917.

Compiled from monthly returns of the railways to the Interstate Commerce Commission and covering roads of Class I, i. e., roads with annual operating revenues above \$1,000,000.

Account	UNITED STATES			EASTERN DISTRICT			SOUTHERN DISTRICT			WESTERN DISTRICT		
	Per mile of line			Per mile of line			Per mile of line			Per mile of line		
	Amount, 1917	1916	Increase over 1916, Per cent	Amount, 1917	1916	Increase over 1916, Per cent	Amount, 1917	1916	Increase over 1916, Per cent	Amount, 1917	1916	Increase over 1916, Per cent
Total operating revenues.....	\$30,719,636	\$15,514	163.1	\$159,815,751	\$2,699	5,236.5	\$49,286,691	\$1,153	962.1	\$1,089	\$924	17.9
Freight.....	24,738,019	1,072	90.2	112,145,429	1,894	1,630	36,388,168	849	705	99,152,432	768	21.3
Passenger.....	68,041,860	295	267	30,124,505	509	473	9,449,639	219	179	28,567,725	221	9.7
Mail.....	6,035,780	41	22	1,947,194	33	32	744,260	17	15	2,234,326	17	11.6
Express.....	8,764,060	40	34	4,551,267	77	62	1,904,773	28	28	3,508,929	27	18.4
All other.....	18,600,909	86	76	11,047,356	186	168	1,110	40	35	7,173,792	56	47
Total operating expenses.....	\$23,550,273	1,020	85.1	112,840,564	1,906	1,575	34,009,995	796	627	88,740,214	687	592
Maintenance of way and structures.....	\$12,151,582	178	168	6,212,943	292	273	5,832,843	133	109	18,241,301	141	139
Maintenance of equipment.....	53,925,916	243	213	22,124,768	458	408	9,346,138	221	179	19,031,540	148	135
Traffic.....	3,455,046	24	24	2,195,633	36	36	998,090	23	23	2,356,223	18	19
Transportation.....	123,042,942	304	409	61,534,142	1,039	786	16,573,360	388	288	44,940,440	348	275
General.....	8,161,840	35	32	3,555,065	60	55	1,301,172	28	26	3,405,603	26	23
All other.....	2,113,027	494	450	1,229,538	21	17	118,392	3	2	765,107	6	1
Net operating revenue.....	114,157,461	71	59	46,975,197	793	790	15,276,696	337	335	51,896,980	402	332
Taxes.....	16,367,481	64.8	1	6,184,097	104	92	2,640,413	62	45	7,742,921	60	49
Uncollectible revenues.....	6,408	1	1	14,255	*	*	16,647	*	1	33,406	*	1
Operating income.....	97,570,514	42.2	390	40,776,335	689	698	12,619,636	295	289	44,120,543	342	282
Operating income—per cent—	316	67.36	91	70.61	66.59	65.19	69.00	63.10	64.09	129,083	128,740	1
Average mileage represented—	1917	231,035	59,213	59,213	42,739	42,612	42,739	42,612	42,612	129,083	128,740	1
Average mileage represented—	1916	230,571	59,219	59,219	42,739	42,612	42,739	42,612	42,612	129,083	128,740	1

* Less than one dollar.

d Decrease.

June net operating income per mile was 8.1 per cent greater in 1917 than in 1916, 35.7 per cent greater than in 1915, 65.2 per cent greater than in 1914, and 48.6 per cent greater than in 1913.

War Convention of American Business Men

The keynote of the War Convention of American Business Men, to be held under the auspices of the Chamber of Commerce of the United States, at Atlantic City September 18 to 21, will be given by Secretary of War Baker, who will tell the business men from all parts of the country what the government expects of them in connection with the war. It is expected to be by far the most significant gathering of the kind since the beginning of the war.

Secretary Baker will bring out the underlying thought of the entire convention, which is the duty business owes the government in war. He will speak as president of the Council of National Defense, and will indicate to business men what services they can render the government in connection with its prosecution of the war.

The convention on later days will divide into groups of business men to consider the application to different lines of business of the broad principle as developed by the Secretary of War in his address. There will be a meeting of the National Council Monday, September 17. The regular sessions will begin Tuesday and last through the following Friday.

At the opening session on September 18 George M. Reynolds, president of the Continental Commercial National Bank, of Chicago, will make clear the call that is made upon every business man to sacrifice personal interest at this time for the national good.

Secretary Lane will open the second session on the first day and will take advantage of the gathering together of business men from all sections of the country to tell for the government, that in the conduct of the war every business man is relied upon to do his part.

Frank A. Scott, chairman of the War Industries Board, will also speak at the second session. Mr. Scott will explain the constitution of the recently created War Industries Board, and the manner in which this board works, and its relations to the industries of the country in providing munitions and supplies of all sorts for the army and navy.

The convention will not be confined to discussions of commercial problems. After the business session each day, there will be meetings in the evenings to hear distinguished men on various interesting aspects of the war, and its effect upon our allies, and our relations with our allies.

On one evening Boris Bakhmeteff, Ambassador from the New Russia to the United States, will discuss phases of the Russian situation which are of particular interest to business men of the United States, and will make suggestions to business men regarding the part which they can play in the development of New Russia.

At one of the early sessions, A. C. Bedford, president of the Standard Oil Company and chairman of the committee on oil of the Council of National Defense, will state for the benefit of business men, representing all lines of industry, the manner in which the oil industries have faced the problems of conservation of supplies and distribution of product.

At another session, Lord Northcliffe, chairman of the British Mission, will deliver an address on what American business men may do to aid our allies.

Giving Preference to Freight Shipments

Business men who may at some time apply for preferential shipment under the terms of the new law (administered by Judge Lovett) should bear in mind that preference can be granted only when essential to the national defense and security. When a manufacturer recently applied for preferential shipment of a material of which he was in need, inquiry was made of these branches of the government served by him, to develop how he stood on contract deliveries and what his attitude was toward supplying the government at fair prices. Business men should not forget the maxim of equity that those asking relief and assistance should come with clean hands.—U. S. Chamber of Commerce Committee Waddill Catchings, Chairman.

Foundrymen's Convention

The annual meeting of the American Foundrymen's Association and the American Institute of Metals will be held in the Mechanics' building, Boston, Mass., September 25 to 28, inclusive. The meeting will be accompanied with its usual extensive exhibits, many of which will be of direct interest to railway men. The following are some of the subjects that will be discussed during the convention:

"Fire Prevention in Large Industrial Establishments," by C. W. Johnson, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.
 "Co-Operative Shop Training," by W. B. Hunter, Fitchburg high school, Fitchburg, Mass.

"Improving the Relationship Between Employer and Employee," by J. F. Kent, American Cast Iron Pipe Company, Birmingham, Ala.

Report of A. F. A. committee on safety, sanitation and fire prevention, by Victor T. Noonan, chairman, Industrial Commission of Ohio, Columbus, Ohio.

Report of A. F. A. representatives on the conference board on training of apprentices, by Frank M. Leavitt, chairman, University of Illinois, Chicago.

"Application of Pulverized Coal to the Air Furnace," by W. R. Bean, Naugatuck Malleable Iron Works, Naugatuck, Conn.

"How Malleable Iron Has Improved," by Enrique Toaceda, Albany, N. Y.
 "Troubles Encountered in Machining Malleable Iron: Causes and Remedies," by A. T. Jeffery, Dayton Malleable Iron Company, Dayton, Ohio.

Report of A. F. A. committee on general specifications for gray iron castings, by W. F. Putnam, chairman, Detroit Testing Laboratory, Detroit, Mich.

"The Effect of High Sulphur in Gray Iron Castings," by T. Mauland, International Harvester Company, Chicago.

"A New System of Burning Crude Oil," by W. A. Janssen, Davenport, Iowa.

"The Use of Vanadium in Steel Castings," by J. Lloyd Uhler, Union Steel Castings Company, Pittsburgh, Pa.

"Melting Yellow Brass in New Form of Induction Furnace," by G. H. Clamer, Ajax Metal Company, Philadelphia, Pa.

"Casting Bearings in Sand and Metal Molds," by R. R. Clarke, Pennsylvania Lines West of Pittsburgh, Pittsburgh, Pa.

"The Present Status of Tin, Fusible Plug Manufacture and Properties," by Dr. George K. Burgess, bureau of standards, Washington, D. C.

"Stellite," by Elwood Haynes, Haynes Stellite Works, Kokomo, Ind.

"The Use of Bronzes in Railroad Turntables and Movable Bridges," by O. E. Selby, Big Four Railroad, Cincinnati, Ohio.

"Analysis of Rabbits and Brasses," by E. W. Hagmaier, Buffalo, N. Y.
 Address by Richard C. MacLaurin, president, League to Enforce Peace.

"The Flux and Cleaner Question of Brass," by E. D. Frohman, S. Obermayer Company, Pittsburgh, Pa.

"Pyrometers: Their Construction and Application," by John P. Goben, Brown Instrument Company, Philadelphia, Pa.

Among the supply companies exhibiting, the following are interested in the railway supply field:

Ajax Metal Company, Philadelphia, Pa.
 Armstrong Cork & Insulating Company, Pittsburgh, Pa.
 Atkins & Company, E. C., Indianapolis, Ind.
 Athol Machine Company, Athol, Mass.
 Ayer & Lord Tie Company, Chicago.
 Beaudry & Company, Inc., Boston, Mass.
 Besley & Company, Charles H., Chicago.
 Bullard Machine Tool Company, Bridgeport, Conn.
 Carborundum Company, Niagara Falls, N. Y.
 Chicago Pneumatic Tool Company, Chicago, Ill.
 Cleveland Pneumatic Tool Company, Cleveland, Ohio.
 Davis-Bournonville Company, Jersey City, N. J.
 Joseph Dixon Crucible Company, Jersey City, N. J.
 General Electric Company, Schenectady, N. Y.
 Goldschmidt Thermit Company, New York.
 Hauck Manufacturing Company, Brooklyn, N. Y.
 Monarch Engineering & Manufacturing Company, Baltimore, Md.
 Mahr Manufacturing Company, Minneapolis, Minn.
 Osborn Manufacturing Company, Cleveland, Ohio.
 Oswald Acetylene Company, Jersey City, N. J.
 Quigley Furnace Specialties Company, New York.
 Sullivan Machinery Company, Chicago.
 Titanium Alloy Manufacturing Company, Niagara Falls, N. Y.
 United States Graphite Company, Saginaw, Mich.
 United States Silica Company, Chicago.
 Warner & Swasey Company, Cleveland, Ohio.
 Whiting Foundry Equipment Company, Harvey, Ill.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meeting and the places of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. of N. J., 143 Liberty St., New York. Next meeting, October 16-17, St. Louis.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 16-18, 1917, Chicago.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 22 W. 57th St., New York.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—E. R. Woodson, Rooms 1116-8 Woodward Bldg., Washington, D. C. Next meeting, September 26. Congress Hotel, Chicago.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—W. L. Connelly, Superintendent, Indiana Harbor Belt, Gibson, Ind. Next annual meeting to have been held September 18, 1917, Washington, D. C., indefinitely postponed.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—W. R. McMunn, New York Central, Albany, N. Y. Next convention to have been held September, 1917, St. Louis, indefinitely postponed.

CINCINNATI RAILWAY CLUB.—H. Boutet, Chief Interchange Inspector, Cincinnati, 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Simon, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 568 Union Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

INVESTMENT BANKERS' ASSOCIATION OF AMERICA.—Frederick R. Fenton, 11 W. Monroe St., Chicago. Annual convention, October 1-3, 1917, Baltimore, Md.

MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next annual convention, October 16-18, 1917, Cleveland, Ohio.

NATIONAL ASSOCIATION OF RAILWAY COMMISSIONERS.—Jas. B. Walker, 120 Broadway, New York City. Next annual convention, October 16, 1917, Washington, D. C.

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

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Geo. A. J. Hochbrebe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PACIFIC RAILWAY CLUB.—W. S. Wollner, Assistant to Chief Engineer, Northwestern Pacific R. R., San Francisco, Cal.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial-Annex Hotel, Pittsburgh.

RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, office of the president's assistant, Seaboard Air Line, Norfolk, Va. Next meeting, October 2-4, 1917, St. Louis, Mo.

RAILWAY REAL ESTATE ASSOCIATION.—R. H. Morrison, Assistant Engineer, C. & O., Richmond, Va. Next convention, October, 1917, Duluth, Minn.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next annual convention, September 18-19, 1917, Hotel Traymore, Atlantic City, N. J.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September 18-21, 1917, Hotel Auditorium, Chicago.

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

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—L. W. Cox, N. & W., Philadelphia, Pa. Next annual convention, October 16-18, St. Louis, Mo.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta, Ga.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Gen'l Ag't, Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings bi-monthly, Pittsburgh.

UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

WESTERN SOCIETY OF ENGINEERS.—Edgar S. Nethercut, Acting Secretary, 1735 Monadnock Block, Chicago, Ill. Regular meeting, first Monday in month, except January, July and August. Extra meetings generally on other Monday evenings except in July and August.

Traffic News

The State Public Utilities Commission of Illinois has continued from September 7 to September 18 a hearing on the application of Illinois roads for a modification of the commission's recent order in a general 5 per cent advance in freight rates case.

The Southern Pacific recently added a freight-carrying steamship to its service between New York and Galveston. The new ship, "El Almirante," has a cubic cargo capacity of 398,490 ft., and a total dead-weight carrying capacity of 8,500 net tons. Its designed speed is 11 knots an hour.

The Delaware & Hudson Company, after a conference with the traffic commissioner of the Albany (N. Y.) Chamber of Commerce, has adopted a rule under which it is proposed to have "sailing days" for freight shipped from Albany, with a view to saving car space by sending cars to given destinations only every second or third day, instead of every day as at present.

The Maine Central has issued tariffs, effective September 1, increasing local passenger fares to the basis of 2.75 cents a mile, and mileage books to the basis of 2.50 cents a mile, an increase of one-fourth cent in each case. So far as intrastate rates are concerned the new tariff cannot go into effect as the Public Utilities Commission of Maine has suspended the tariff until December 1.

The State Public Utilities Commission of Illinois will hold a hearing at Chicago on September 12 to consider proposed additions and changes to the Illinois Commissioners' Classification. New ratings are asked on baskets, phonograph cabinets, cement mixing compounds, concrete slabs, corn oil, paper, envelopes, household goods, lime, live poultry, tubing, pipe fittings, stoves, ranges, furnaces, stone, self-propelling vehicles and other commodities. The commission has just issued Supplement No. 31 to Illinois Commissioners' Classification No. 10, effective October 1.

The Commission on Car Service has addressed a circular to the railroads announcing that in order to relieve congestion and resulting delays in shipments of raw cotton, the director of the Bureau of Export Licenses has been authorized by the Exports Administrative Board to waive, until October 1, the requirement of export licenses for raw cotton destined to Great Britain, France, Italy, Japan, or their colonies, possessions and protectorates, and also shipments direct to Russia. All shipments which are covered by railroad bills of lading or ocean bills of lading dated October 1 or later will require licenses.

The Commission on Car Service has issued a circular to the railroads stating that it has come to its notice that in some cases placards affixed to the outside of cars carrying government shipments are not removed at destination of the loading. The result is that cars subsequently move about the country in various directions with other loading or empty, thus destroying the effect which the placards are intended to accomplish, which is that government freight shall be given preference. The roads are asked to give instructions that will insure the removal of such placards in all cases as soon as the shipments to which they apply are unloaded.

An inquiry into the reasonableness of rates on cotton and woolen goods proposed by the New England railroads was begun at Boston Tuesday by Examiner Patterson, of the Interstate Commerce Commission. Last April the railroads filed tariffs which would increase the rates on cotton piece goods between New England points and New York about eight cents per 100 lb. and would also increase the rates on woolen piece goods and on manufactures from cotton and wool. These tariffs were suspended by the Commission on complaints by the various mills represented by the Arkwright Club, the American Woolen Company, and others.

Large quantities of freight will be moved by boat on the Mississippi river, in the near future, if a writer in the New York Sun may be believed. He says that boats which have been rotting at their wharves for years are now being refitted for

active service, and that "feverish activity" is observable at almost every important port on the river. The government is now making a canal through or around the Le Claire Rapids, the only remaining obstacle in the river to the use of boats throughout its length drawing six feet of water. The northern limit of navigation has been extended from St. Paul to Minneapolis. Large steamships navigate the river from the sea up to 40 miles above Baton Rouge. Looking at the other side of the picture, this writer says: "Outside New Orleans the most primitive methods of handling river traffic are still to be found at many large ports. Freight is being handled very much as it was in the days before the civil war. In many ports trucks cannot be used, and every package is taken aboard by manual labor. At one port freight being transhipped from the railroad to the river is carried by man power over four railroad tracks and down a mud river bank to the steamer."

Illinois Commission Makes Appeal for Car Economy

The State Public Utilities Commission of Illinois, on September 12, issued "An Appeal to the Patriotic Public," calling attention to the need of uninterrupted maintenance of railway transportation and pointing out that it is the duty of every American citizen and institution to co-operate with every agency which is helping win the war. "The plain truth," says the Commission, "is that the railroads have not, and will not have, during the war enough freight cars to meet the demand. They cannot get cars which were ordered many months ago. Load every car promptly and to the maximum marked capacity. Unload every car with the greatest possible despatch. Ask only for the cars needed, and when needed. . . . Buyers of many commodities can and should order by maximum carloads instead of by the customary trade units. . . ."

Progressive Farmers

The Association of State Farmers' Union Presidents, in session at Houston, Texas, September 5, adopted resolutions endorsing the federal food control act and commending the guaranteeing of prices; and the resolutions continued: We understand the food act as giving the federal government complete supervision of all transactions connected with all articles of trade between producer and consumer, except that of transportation; and . . . we look upon the future of our transportation industry with deep concern mingled with alarm. We consider the physical properties inadequate to meet traffic requirements, the public policy confusing and uncertain and the political conscience we believe hostile to a calm and dispassionate treatment of the subject. Farmers' unions have invariably asked for federal control either through regulation, operation or ownership. We venture the conclusion that the agricultural public favors exclusive federal authority over rates, securities and equipment through such a system as will bring about the greatest economy and efficiency in service.

Cincinnati Freight Houses Now Closing Earlier

Since September 1 freight houses at Cincinnati, Ohio; Covington, Ky.; Newport and Ludlow, have closed daily, except Saturday and Sunday, at 3:30 p. m., instead of at 4:30. The new closing hour was agreed upon by the Cincinnati committee of the Commission on Car Service and the local committee of the National Industrial Traffic League. The Merchants and Manufacturers Package Freight Bureau, Cincinnati, recommended closing at 2:30 p. m., and the action in adopting 3:30 p. m. as the closing time was a compromise between those who favored the early hour and those who opposed any change from the old hour. W. C. Farrington, vice-chairman of the Cincinnati committee of the Commission on Car Service, states that the new closing hour is essential on account of the application of the eight-hour day to train, engine, yard and other operating employees, which makes it necessary to make up locals and run connecting line transfers earlier. The earlier hour is also desirable because of the fact that in Cincinnati, as in most other railroad centers, the making up of locals and through freight trains takes place in the yards, which must also be used for switching passenger trains together, etc. Under former conditions locals and other trains handling cars from freight houses could not be made up until 7 or 7:30 p. m., or sometimes later, thus congesting the yards when they should be clear for incoming and outgoing pas-

senger service. The new plan enables bill and other local office clerks in freight houses to finish their work earlier than formerly, when they were generally held until 6:30 or 7 p. m. every night sorting, checking and typing the bills brought in by last-minute shippers. From the standpoint of the prompt handling of freight the new closing time is superior to the old, as many trucks formerly arrived at the houses just at 4:30 p. m., and had to stand in line possibly until 6 o'clock before they could get to the platforms and unload, a condition which inevitably resulted in congestion and delay.

Urges Early Shipment of Wheat

Fairfax Harrison, chairman of the Railroads' War Board, has issued a statement urging the early marketing of wheat. The statement says:

"We are assured that the price of wheat determined by the President will be maintained throughout the year by the Food Administration, and that there can be no objective in holding wheat. In fact the farmer saves interest and deterioration by marketing early.

"At the present time the railways can handle more wheat to storage points for ready distribution and to mills to be manufactured into flour for domestic consumption and exportation to our Allies, where it is much needed, and for which ships are available at ports. The railways wish to appeal to the farmers to bring their wheat to market now. Later in the fall the handling of many more products will cause congestion and delays.

"The railways are now being operated in common to serve the entire community. The demands for movements of military and supplies will be an increasing burden. Therefore, the railways must have the co-operation of the entire community."

Meeting of Chicago Car Service Committee

At the last meeting of the Chicago Committee of the Commission on Car Service it was decided that the plan of equalizing box cars used at freight houses and transfer platforms in the Chicago switching district, agreed upon June 11, cannot be successfully carried out without defeating the purpose of the Commission owing to the fact that cars are repeatedly ordered from eastern to western lines to take care of the movement of eastbound traffic. The plan was therefore abandoned. It was also announced that a committee of local freight agents of roads entering South Bend, Ind., had been formed to act in conjunction with and to assist the Chicago Committee.

D. I. Forsyth, vice-chairman of the Chicago Committee, presented a report on intensive loading activities. He stated that considerable difficulty is encountered in inducing shippers to load grain to the carrying capacity of cars because of the practice of buyers in eastern and New England territory of ordering minimum carload shipments, particularly of oats, which they will not accept in lots of more than 51,000 to 54,000 lb. per car. Investigation of a large number of cars has disclosed the fact that only 80 per cent of car capacity is utilized for oats, 89 per cent on wheat and 72 per cent on corn. The matter of prevailing upon eastern buyers to order full carloads has been taken up with the committees at Boston, New York and Philadelphia and the Commission on Car Service at Washington. To illustrate the possible improvement in loading, Mr. Forsyth cited one Chicago shipper, who recently forwarded 26 cars of export oats, which were loaded to 105 per cent of capacity. Had this shipment been loaded on the basis of domestic shipments, it would have required 30.65 cars. At the same time, five cars of domestic oats were loaded which, on the export basis, could have been taken care of in four cars. Reports from a brick company at Bernice, Ill., indicate that it is loading cars to 98 and 100 per cent of carrying capacity. Reports from the Forest Hill (Chicago) station of the Baltimore & Ohio Chicago Terminal show that the average trap car loading was 23,430 lb. for July, 1917, as against 21,518 lb. for July, 1916. Outbound loading of merchandise during the same period was 18,625 lb. as against 16,000 for July, 1916. According to advice from Sheboygan, Wis., the C. Reiss Coal Company, in July, 1917, loaded 327 cars of soft coal to 99.8 per cent of marked capacity and 509 cars of hard coal to 105.1 per cent of marked capacity.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The Interstate Commerce Commission has suspended until March 12 the proposed Central Freight Association class rate scale No. 2.

The Interstate Commerce Commission has announced a hearing for the taking of further testimony on the protest of the Kansas City Southern to the tentative valuation of its property made by the division of valuation, at Kansas City, Mo., on September 18 before Examiner-Attorney John H. Gray.

The Interstate Commerce Commission has approved for filing a tariff of the Pullman Company increasing the fares for accommodations between El Paso and Laredo, Texas, and destinations in Mexico on the Constitutionalist railway by changing the fare from Mexican currency to United States currency. The proposed fares are the same as those in force on the Constitutionalist railway and have the approval of the Mexican government. The commission allowed them to become effective on three days' notice.

An informal hearing was held before the suspension board of the Interstate Commerce Commission at Washington on September 10, at which shippers protested against the proposed increases in rates filed by the railroads on petroleum and petroleum products in Official Classification territory, and grain and grain products and by-products from western points to Trunk Line territory. Clifford Thorne and officers of the National Petroleum Association and the Western Petroleum and Refiners' Association presented a strenuous opposition to the proposed increases in petroleum rates on the ground that they would play into the hands of the Standard Oil interests, which transport their product largely by pipe lines, to the disadvantage of independent oil interests. These tariffs are among those filed by the eastern railroads in an effort to secure advances in a large number of commodity rates on which advances were denied in the decision of the commission in the 15 per cent case.

Grain and Grain Products from Cairo

Cairo Board of Trade v. Cleveland, Cincinnati, Chicago & St. Louis et al. Opinion by Commissioner Meyer:

Upon complaint that the rates on grain and grain products from Cairo, Ill., to points in trunk line and New England territories are unjust and unreasonable, and unduly prejudicial to Cairo and unjustly preferential of Chicago, Peoria, St. Louis and other points from which reshipping rates are published, held:

Such rates are not shown to be unjust and unreasonable on grain from Cairo proper.

The maintenance of reshipping rates from Chicago, Peoria and East St. Louis, Ill., and from St. Louis, Hannibal, and Louisiana, Mo., but not from Cairo, Ill., is unduly prejudicial to Cairo and unjustly preferential of competing markets. The unlawful prejudice and disadvantage required to be removed by the publication of reshipping rates from Cairo to the destinations involved not more than one cent higher than the reshipping rates contemporaneously maintained from St. Louis to the same destination. (46 I. C. C., 343.)

Class Rates on Southeastern Traffic at Indianapolis

Indianapolis Chamber of Commerce v. Cleveland, Cincinnati, Chicago & St. Louis et al. Opinion by Commissioner McChord:

Prior to October 15, 1914, defendants maintained proportional class rates from Indianapolis and Terre Haute, Ind., and Chicago, to Ohio River crossings applicable to southern traffic subject to the southern classification, and the local class rates northbound on similar traffic were subject to the southern classification. On that date the local rates were made effective on southbound traffic from Indianapolis and Terre Haute, and northbound and southbound traffic was made subject to the official classification. No change was made in the proportional rates from Chicago, or as to the application of the southern classification on southbound and northbound traffic. On April 1, 1915, the Indianapolis

and Terre Haute rates were increased 5 per cent, but no corresponding change was made in the Chicago proportional rates. Upon the facts of record; *Held*, That the carriers have shown that the present rates and charges are reasonable *per se*, but that the present adjustment results in undue prejudice to shippers and receivers of southeastern traffic at Indianapolis and Terre Haute. (46 I. C. C., 547.)

Buffalo Grain Cases

Buffalo Chamber of Commerce et al. v. Buffalo Creek et al. Opinion by Commissioner Harlan:

Ex lake rates on grain and grain products, domestic and export, from Buffalo to the Atlantic seaboard and interior points in the same general territory are not found to be either intrinsically unreasonable or unduly preferential of Chicago to the prejudice and disadvantage of Buffalo.

The maintenance of ex rail reshipping rates on domestic and export grain from Chicago to the Atlantic seaboard and interior points in the same general territory, when rates the same in kind are not contemporaneously maintained from Buffalo to the same territory, is, however, found to be unduly preferential of Chicago to the undue prejudice and disadvantage of Buffalo.

The defendants' refusal to accord transit service for the same charge at points east of Buffalo on grain moving from Buffalo as they accord at the same points on grain from Chicago, Toledo, Detroit, Cleveland and Sandusky, is found to be unduly prejudicial of Buffalo.

The defendants are required to submit for examination and approval a schedule of ex rail reshipping rates on domestic and export grain from Buffalo, and also a schedule of amended transit services and charges free from the inequalities herein found to exist. (46 I. C. C. 570.)

Eastern Commodity Rates Suspended

The Interstate Commerce Commission has suspended until December 30, with certain exceptions, tariffs filed by the eastern railroads in what has been designated as the eastern commodity rate case, in which the roads have endeavored to secure advances not allowed by the commission in the 15 per cent case in commodity rates which have a definite relation to the class rates, and which the roads claim would be discriminatory if not advanced when the class rates are increased. The tariffs which the commission has suspended were to become effective on September 15 and later dates. The commission's order named the tariffs involved and announced the suspension of all schedules in them insofar as they affect increases in rates all-rail, except for a long list of commodities, which included alcohol, aluminum, coal and coke, leather, grain and grain products, iron ore, iron and steel articles, live stock, lumber and hogs, fresh and dressed meats, oil, petroleum and its products, packing house products, stone and sugar. The proposed advances in the eastern rates on live stock and fresh meats which were included in the list of exceptions were, however, suspended by another order until January, 1918. These rates were the subject of an informal hearing before the suspension board on August 28. The grain and petroleum rates were the subject of similar hearings on September 10 and 11.

Second Duluth Case

Commercial Club of the City of Duluth et al. v. Pennsylvania Company et al. Opinion by Commissioner Harlan:

This proceeding is a renewal of the efforts the city of Duluth has been making for some years to secure a rate adjustment that properly accords with its location at the head of western extremity of the great lakes. By way of the lakes the route from Buffalo to Duluth is 985 miles in length; and there are various intervening lake ports through which traffic may move between Duluth and practically the whole of Official Classification territory lying east of the Indiana-Illinois state line, over rail-and-lake routes that do not differ greatly in length from the all-rail hauls between the same points. This practical parity in the length of the various routes is accompanied by a further condition that is favorable to Duluth, because of the fact that the movement of commerce by water is relatively less expensive than its carriage by rail. These advantages, as Duluth contends, were not reflected in the rates in effect when the complaint was filed.

The commission's findings are as follows:

The rail-and-lake class and commodity rates to Duluth from all points in trunk line territory and from all points in central freight association territory are not shown to have been or to be unjust and unreasonable.

Such rates from certain points in trunk line territory that are higher than the rates from the same points to Chicago are, however, found to be unduly prejudicial of Duluth and unjustly preferential to Chicago.

Class differentials in the rates to Duluth under rates to the twin cities of St. Paul and Minneapolis, heretofore found reasonable and now observed, are on the six classes in cents per 100 pounds 21, 18, 13, 8, 7 and 5. Commodity rail-and-lake rates to Duluth in excess of rates obtained by deducting the class differential of the classification of such commodity from the contemporaneously named rates to the twin cities are found to be unduly prejudicial of Duluth and preferential to the twin cities.

Applications for authority to continue to charge for the transportation of all freight from points of origin in official classification territory to Minneapolis, Minn., and St. Paul, Minn., and points taking the same rates, over rail-and-lake, lake-rail-and-lake, and lake-and-rail routes through Lake Superior or Lake Michigan ports, class and commodity rates which are lower than the rates contemporaneously maintained on like traffic to intermediate points over the same routes and through the same ports, granted in part, denied in part, and in part reserved for further consideration. (46 I. C. C. 585.)

STATE COMMISSIONS

The Public Service Commission of Indiana on September 11 granted an increase of 15 cents a ton on coal, where the rates exceeded 80 cents a ton, and 10 cents a ton where rates were below 80 cents.

COURT NEWS

Effect of Federal Employers' Liability Act on State Workmen's Compensation Acts

The Federal Employers' Liability Act, within its scope, viz., interstate commerce, deals with the same subject that is dealt with by the New Jersey Workmen's Compensation Act, under which the duty of an employer to make compensation to an employee for injuries arising out of the employment may exist independently of the negligence of the employer; whereas the federal statute makes such duty to depend upon such negligence, and excludes the existence of such duty in the absence of negligence. The federal act, being thus comprehensive, both of those cases in which it excludes liability and of those in which it imposes it, the New Jersey Court of Errors and Appeals holds that it ousts the courts of common pleas of the state of jurisdiction under the New Jersey Workmen's Compensation Act to award the compensation to be paid by a carrier to its employee for injuries received by the latter while both were engaged in interstate commerce. — *Ronsaville v. New Jersey Central (N. J.)*, 101 Atl. 182. Decided June 18, 1917.

Notice of Claims Recent Cases

The Kansas City Court of Appeals, considering an interstate shipment of live stock, holds that a provision that the shipper should give written notice of any claim for damages before the stock is removed and mingled with other stock, is enforceable; and the provision cannot be waived by the carrier. The fact that the carrier's local agent saw the live stock when it arrived and knew of its bad condition, or made "bad order" report to the company, did not dispense with the notice of damage required by the contract of shipment. — *O'Brien v. Pryor (Mo.)*, 195 S. W., 759. Decided May 21, 1917.

The Iowa Supreme Court holds that a bill of lading condition that claims for loss, etc., must be made in writing within four months, is reasonable and binding on a shipper in an action against a terminal carrier, although the condition was made by the initial carrier. In order to recover, the shipper must show by competent evidence not only that he delivered the statement, but the terms of the statement itself. The latter he cannot do by parol testimony. The only effect of the Carmack amendment, as applied to connecting or terminal carriers, is to give them the benefit of all lawful conditions or provisions in the contract made

by the shipper with the initial carrier.—*Erisman v. C. B. & Q. (Iowa)*, 163 N. W., 627. Decided June 26, 1917.

A bill of lading signed by the consignor and the carrier contained on its face a recital "that every service to be performed shall be subject to all the conditions, . . . (including conditions on back hereof)." On the back of the contract was the stipulation that claims for loss must be made in writing within four months. The claim was not filed until after the lapse of nearly a year. The Georgia Court of Appeals holds that the provision requiring notice within a certain time does not amount to an attempt to exempt the carrier from liability for negligence. Such a clause is not void on the ground that the carrier thereby seeks to limit liability, and does not give as a consideration therefor any extra service or special rate or other monetary consideration to the shipper, or that it is contrary to the public policy of the state. Judgment for the plaintiff was reversed.—*Southern v. Simpson (Ga.)*, 93 S. E., 47. Decided June 18, 1917.

The Mississippi Supreme Court holds that a live stock contract provision, requiring verified claim of loss or damage to be given to specified railroad employees within 10 days after the stock is removed, is valid as to interstate shipments; but that the stipulation may be waived by the acts and conduct of the proper agents of the railroad company. It is held to be waived where the shipper wrote the railroad's general claim agent regarding his claim within the 10 days, and the claim agent negotiated with him concerning its payment.—*Illinois Central v. Bauer (Miss.)*, 75 So., 376. Decided May 21, 1917.

The Oregon Supreme Court holds that in an action against a common carrier for damages due to failure to notify consignor of non-delivery of goods, failure to present a formal bill as a claim for damages within the time limited in the contract was not fatal, where the defendant was notified in writing that the consignor had a claim against it and insisted on its payment; the consignor's letters being so specific as to give the defendant the preliminary information necessary to a proper investigation of the facts.—*Stoddard Lumber Co. v. Oregon-Washington R. & N. Co. (Ore.)*, 165 Pac., 363. Decided May 29, 1917.

Statutory Exemption from Liability to Passenger Who Violates Rules

The New Jersey statute provides if a passenger be "injured by reason of his going . . . on the platform . . . in violation of the printed regulations" posted in a "conspicuous place inside of cars," said company shall not be liable for the injury. Defendant railroad conspicuously posted at each end of its cars a notice reading, "Passengers must keep off the platform until the train stops." Plaintiff, on defendant's train in New Jersey, after the station was called, but before the train stopped, went upon the platform, and was thrown to the ground in front of the station by a jerk of the train. The New York Appellate Division holds that defendant was not liable for plaintiff's injury. This plaintiff was injured while deliberately violating a rule which unmistakably forbade his going onto the platform "until the train stopped." If the statute means anything, it permits this notice, and exempts defendant from liability for accidents from its violation. If the prohibition in the notice means anything, it prohibits the very act of the plaintiff which resulted in his injury.—*Kettell v. Erie*, 163 N. Y. Supp., 640.

Recent Decisions Under the Federal Employers' Liability Act

The Kentucky Court of Appeals holds that a trackman of an interstate carrier killed just after "smoothing" the track, and while going to a place designated by the foreman to assist in unloading ties to be used in the track, was engaged in interstate commerce.—*L. & N. v. Williams (Ky.)*, 194 S. W., 920.

The Wisconsin Supreme Court holds that a track man, who was peeling ties intended for use in an interstate roadbed when injured was not engaged in interstate commerce.—*Karras v. Chicago & N. W.*, 162 N. W., 923.

The Vermont Supreme Court holds that where a railroad employee was injured while repairing a roundhouse wall of the railroad, a portion of which fell upon him, he was not engaged in interstate commerce.—*Castonguay v. Grand Trunk (Vt.)*, 100 Atl., 908.

Where an employee of an interstate carrier was not engaged in interstate commerce at the time of his death, the Georgia Court of Appeals holds that the fact that he was killed by an

interstate passenger train would not bring him within the operation of the act.—*Hardy v. Atlanta & West Point (Ga.)*, 93 S. E., 18.

A station employee was killed by a train carrying interstate passengers and mail while attempting to pass in front of it to secure mail from it intended for his station. The Massachusetts Supreme Judicial Court holds that he was engaged in interstate commerce.—*Lynch v. B. & M. (Mass.)*, 116 N. E., 401.

The Mississippi Supreme Court holds that a railroad laborer engaged in loading sand and gravel for use in repairing defendant railroad's interstate roadbed is not engaged in interstate commerce.—*Yazoo & M. V. v. Houston (Miss.)*, 75 So., 690.

The Alabama Supreme Court holds that a person employed by a railroad as a member of a posse to search for and apprehend bandits who had robbed an interstate train was not engaged in interstate commerce so as to fix liability on the road for his death under the act.—*Alabama Great Southern v. Bonner (Ala.)*, 75 So., 986.

The Texas Supreme Court holds that a brakeman who received a fatal injury from being thrown from the top of a car while engaged in switching cars destined for points without the state was engaged in interstate commerce.—*Geer v. St. Louis, S. F. & T. (Tex.)*, 194 S. W., 939.

The Colorado Supreme Court holds that where a trackman, when injured, was engaged in inspecting and repairing a track used in interstate commerce, he was engaged in interstate commerce.—*Denver & R. G. v. Da Vella (Colo.)*, 165 Pac., 254.

The Illinois Supreme Court holds that a switchman, who is fatally injured while engaged in moving cars from shops to storage tracks to be iced, the cars not having at that time been selected to participate in interstate shipments, is not engaged in interstate commerce, even though the cars, when afterward moved to a loading platform, are loaded with interstate goods.—*Chicago Junction v. Industrial Board (Ill.)*, 115 N. E., 647.

An employee was engaged in removing snow from tracks, both interstate and intrastate. The work was temporarily suspended, and the employee was going along the track to take refuge in a covered car from a storm, when he was struck by an overdue passenger train and killed. The New Jersey Court of Errors and Appeals holds that it was for the jury to say whether he was engaged in interstate commerce at the time, and judgment for the plaintiff was affirmed.—*Armbrecht v. D. L. & W. (N. J.)*, 101 Atl., 203.

The Texas Court of Civil Appeals holds that a trackman, injured while helping the assistant foreman to take ties unloaded on the right of way to a stack near the toolhouse for convenience, and to keep them in good shape for future use, was not injured in interstate commerce, though the branch of the railroad on which the ties were afterwards used was employed by the road in hauling interstate freight.—*M. K. & T. v. Watson (Tex.)*, 195 S. W., 1,176.

A rear brakeman on a freight train at the end of his run still had these duties to perform: Take down the markers, clean and fill eight lamps and lanterns, sweep out the caboose, register in, and, in this instance, get a supply of kerosene from the storehouse. As soon as the caboose was set on its proper track, the brakeman took in the markers and got the kerosene, and then sat down to read, and fell asleep for three hours. He then finished his duties and started on the usual route through the yard between two tracks. There was room enough by walking carefully to avoid injury, but he unconsciously swerved towards one of the tracks, and his foot was crushed by a locomotive coming up from behind. In an action under the act, alleging negligence through failure to ring the engine's bell, the Minnesota Supreme Court held that it was a question for the jury whether the unintentional delay of a few hours in the plaintiff's work removed him from the protection of the act.—*Davis v. Rock Island (Minn.)*, 158 N. W., 911.

The New York Appellate Division holds that a man in the employ of a railroad at its coal pockets at its yard, part of whose work was to coal the engines as required, and at other times to shovel coal from cars into chutes, and who, immediately before the contributory negligence of a fellow servant, a hostler in charge of a switching engine, resulting in his death, was engaged in coaling the switch engine used wholly within the yard in moving cars engaged both in interstate and intrastate commerce, and which on the day of the accident had moved only cars engaged in interstate commerce, was not himself "engaged in interstate commerce."—*Giovio v. N. Y. C.*, 162 N. Y. Supp., 1,026.

Equipment and Supplies

FREIGHT CARS

THE VERDE TUNNEL & SMELTER RAILROAD is in the market for 25 60-ton ore cars.

THE JAVA STATE RAILWAYS are reported as having ordered 172 box cars from the Standard Steel Car Company.

THE TEXAS COMPANY is buying specialties for 300 tank cars, which it will build in its own shops at Port Arthur, Tex.

THE PROCTER & GAMBLE TRANSPORTATION COMPANY has ordered 100 40-ton tank cars from the Pennsylvania Tank Car Corporation.

THE RUSSIAN GOVERNMENT is negotiating for the purchase of specialties and parts for about 10,000 cars, which will be assembled in Russia.

PASSENGER CARS

THE ERIE is in the market for 88 underframes for passenger cars.

THE GRAND TRUNK PACIFIC recently asked prices on 50 to 100 refrigerator cars for passenger train service.

THE CHICAGO, MILWAUKEE & ST. PAUL is asking prices on 50 refrigerator cars for passenger train service, reviving an inquiry first issued last February.

SIGNALING

THE MISSOURI, KANSAS & TEXAS has ordered from the General Railway Signal Company the materials for an interlocking plant at Muskogee, Okla.—24-lever machine, with 22 working levers.

THE NEW YORK CENTRAL has ordered from the General Railway Signal Company a 16-lever electric section for a Model 2C electro-mechanical interlocking machine, to be mounted on an existing Saxby & Farmer machine at Berea, Ohio.

THE UNION PACIFIC is to install a mechanical interlocking at Laramie, Wyo., a 32-lever Saxby & Farmer machine, with 24 working levers and eight spare spaces. The material will be furnished by the General Railway Signal Company.

THE SEABOARD AIR LINE is to install an interlocking plant at Bellaire, Fla., a 12-lever Saxby & Farmer machine, with 10 working levers. The contract has been let to the General Railway Signal Company, whose men will install the apparatus.

THE PENNSYLVANIA has ordered from the General Railway Signal Company three 8-lever interlocking machines, and three dwarf interlocking machines, to be installed at Wrightstown, N. J., where the government has established a military training camp.

THE ATCHISON, TOPEKA & SANTA FE has ordered from the General Railway Signal Company an electric interlocking plant for Bragdon, Colo.; a 32-lever, Model 2 unit lever type machine, with 23 working levers. The material will be installed by the railroad forces.

THE CINCINNATI, NEW ORLEANS & TEXAS PACIFIC has ordered the materials for alternating-current, automatic block signals between Science Hill, Ky., and King's Mountain, 14 miles. This installation will consist of 25 one arm, three position signals, with the necessary relays, switch indicators, transformers, lighting arresters, track impedances, relay boxes, etc. The materials will be furnished by the General Railway Signal Company.

\$14,550,000 FOR GOOD ROADS.—For the construction and maintenance of rural post roads the Secretary of Agriculture announced recently the apportionment of \$14,550,000 of federal funds to be used in the fiscal year ending June 30, 1919, by the several states.

Supply Trade News

Charles V. Eades, sales manager and engineer of the asphalt products department of the Sarco Petroleum Products Company, Chicago, for the past eight years, has left the service of that company.

Arthur C. Sullivan, formerly with the Hensley Trolley Manufacturing Company, of Detroit, Mich., has been appointed a sales representative of the National Railway Appliance Company, New York. Mr. Sullivan will be attached to the Chicago office of the company.

The Robinson Paint Company, Aurora, Ill., announces that it has purchased the plant, business and good will of the Akron Mining, Milling & Manufacturing Company. The business will be continued along the same general lines as heretofore, with the same organization.

The Standard Asphalt & Refining Company, 208 South La Salle street, Chicago, has purchased the plant, trade-mark and good will of the Sarco Petroleum Products Company. The Cities Service Company, 60 Wall street, New York, is behind this company, although the management will be essentially the same as heretofore. Charles Muller, who was an executive of the former company, has been appointed manager, and Robert S. Trumbull has been promoted to manager of the railway and building materials' department.

H. J. Richardson has been appointed works engineer for the Berger Manufacturing Company, Canton, Ohio. His new work includes the power plant, new constructions, maintenance and repair of manufacturing equipment and buildings. Mr. Richardson recently was connected with the New England Westinghouse Company, where he was manager of the gate department. Previous to this connection he was acting chief engineer of the ordnance department of the Crucible Steel Company, Harrison, N. J., and prior to that he was with the Commonwealth Edison Company of Chicago, the last seven years of this service having been in the engineering department.

Thomas H. Garland, president of the Garland Ventilator Company, Chicago, whose death was announced in the *Railway Age Gazette* on August 23, was born at Augusta, Me., on December 10, 1855. He entered railway service as a brakeman with the Chicago, Burlington & Quincy, at Quincy, Ill., in 1872, and several years later became baggage man at the same point. In 1882 he was promoted to clerk in the freight office at Chicago, and later was appointed chief clerk in the same department, which position he held until his appointment as superintendent of refrigerator car service. In 1908 he left the Burlington to engage in the railway supply business in which he was interested until his death.

Lewis S. Louer, western manager of Sweet's Catalogue Service, Chicago, has purchased a half interest in Engineering and Contracting, Chicago, and has assumed the business management of this publication, sharing the ownership with Halbert P. Gillette, who remains chief editor. Mr. Louer has been in the technical publication field since 1895, when he first became connected with the advertising service department of the Engineering and Mining Journal. He was advertising manager of Cassier's Magazine from 1896 to 1902, when he became western manager of Engineering Record. After ten years' service with that company he resigned to become western manager of Sweet's Catalogue Service.

The Austin Company, structural engineers, Cleveland, Ohio, announces the promotion of Edward Smith to chief draftsman in the Philadelphia office. Mr. Smith was born near Finleyville, Pa., on December 8, 1873, and graduated from Pennsylvania State College in 1893. He began his business career as a draftsman with the Keystone Bridge Works in 1896, and was later associated with the Fort Pitt Bridge Works and the American Bridge Company at Pittsburgh, Pa. In 1905, he became structural engineer of the Pittsburgh Railways Company.

in the construction of the Cannonsburg branch. Several years later he became associated with the Wheeling & Lake Erie as assistant engineer in the Cleveland office, which position he held until he went with the Austin Company.

James P. Beck, general manager of the Portland Cement Association, Chicago, died September 8 at that city. Mr. Beck was born at Odell, Ill., January 27, 1886, and graduated from the University of Illinois in 1907. He entered the employ of the Universal Portland Cement Company the same year, and two years later was made publicity manager. He was later prominent in connection with the conduct of shows of the Cement Products Exhibition Company. In the fall of 1915 he was chosen to prepare plans for broadening the scope of the work of the Association of American Portland Cement Manufacturers, and in December of that year, when his plan was adopted, he was made general manager of the association. This position he continued to hold up to his death.

The Sangamo Electric Company announces the opening of a Chicago district office in the Old Colony building, in charge of C. H. Hurtt as district manager. For several years past the Sangamo company has had a Chicago representative located with the Electric Appliance Company, for many years selling agents for the Sangamo Electric Company throughout the middle west. In establishing this new office, the Sangamo company has made no change in the selling arrangements, which it has had for many years with the Electric Appliance Company and the Federal Signal System (Electric) of Chicago, who will continue to handle Sangamo products exactly as in the past. The new office has been established with a view to giving a more complete service on Sangamo meters and other products than has heretofore been possible in Chicago and surrounding territory, this being necessary on account of the greatly increased demand for Sangamo products. A completely equipped repair department will be maintained as heretofore, under the management of the Chicago office.

Automatic Straight Air Brake Company

The Automatic Straight Air Brake Company has been incorporated under the laws of Delaware with a capital stock of \$5,000,000 preferred and \$20,000,000 common to manufacture and sell a new type of air brake, the invention of Spencer G. Neal, who is the designing engineer of the company.

The directors are A. B. Boardman, A. M. McCrea, K. B. Conger, H. I. Miller, C. R. Ganter, S. C. Holaday, A. M. Trueb and G. C. Pierce.

The officers will be H. I. Miller, chairman of the board and president; K. B. Conger, vice-president and treasurer; A. M. Trueb, secretary and auditor; and G. C. Pierce, chief engineer. The company will have offices at 14 Wall street, New York.

Good progress is being made in the preparations for a railroad officers' demonstration of the brake, which will take place in New York the early part of October.

Arrangements for manufacture are well under way. The company will not build its own plant until after the war.

Baldwin Locomotive Works

President Alba B. Johnson of the Baldwin Locomotive Works announces the following changes in the organization of that company and of the Standard Steel Works Company. In the Baldwin Locomotive Works no change has been made with respect to William L. Austin, chairman of the board, or Alba B. Johnson, president. Samuel L. Vauclain, hitherto vice-president, however, becomes senior vice-president; Grafton Greenough, sales manager, now becomes vice-president in charge of sales; J. P. Sykes, general superintendent, becomes vice-president in charge of manufacture, and James McNaughton, formerly vice-president of the American Locomotive Company, becomes consulting vice-president.

In the Standard Steel Works Company, William Burnham, heretofore president, has been elected chairman of the board, and other officers have been elected as follows: Alba B. Johnson, president; Samuel M. Vauclain, senior vice-president; Robert Radford, vice-president and treasurer; A. A. Stevenson, vice-president and engineer; Wm. H. Pugh, Jr., secretary; T. L. Rogers, assistant treasurer, and O. C. Skinner, works manager.

Railway Construction

ESSEX TERMINAL.—The Dominion parliament has authorized this company to build a branch from the existing line near Ojibway, Ont., to Pelton, seven miles.

GAULEY & EASTERN.—See Kanawha & Michigan.

KANAWHA & MICHIGAN.—The Gauley & Eastern is building from Gauley Bridge, W. Va., on the Kanawha & Michigan, along the west bank of Gauley river to Belya in Fayette county, on the Kanawha & West Virginia, 5.6 miles. The grading contract has been let to J. B. Lindsay, Littleport, Ohio, and involves handling 35,000 cu. yd. to the mile, three-quarters of which will be rock work. The track laying and bridge work will be carried out by company forces. The line is being built to carry coal and lumber.

NEW YORK, NEW HAVEN & HARTFORD.—This company has begun work with its own forces in preparation for the new brick station, which is to be built at New Haven, Conn. The building will be 90 ft. wide by 300 ft. long, and will face Union avenue. The main waiting room is to be 80 ft. wide and 136 ft. long. Part of the second story will be used as a dining room, and the rest of the second story for offices.

PACIFIC ELECTRIC.—This company is making several improvements at the Macy street yards, Los Angeles, Cal., which include the construction of a car inspection house, 246 ft. by 85 ft., with six through pit tracks; a car repair shop, 160 ft. by 150 ft.; a two-story trainmen's building, 32 ft. by 82 ft., containing instruction room, locker room, offices, etc., and a storehouse, 22 ft. by 25 ft. The total cost of the buildings will approximate \$151,000.

FROM SINGAPORE TO BANGKOK BY RAIL.—By the linking up of the Federated Malay States railways (which now extend northward to the Siamese border) with the southern railway system of Siam, through rail communication, has been established from Singapore to Bangkok, a distance of nearly 500 miles. The railway from Prai, opposite the island of Penang, to the Siamese border, has been built and will be operated by the Federated Malay States Railway Department, and is the property of the Federated Malay States Government. The railway from Perlis (one of the nonfederated Malay States) border to Bangkok has been built by the Siamese Government with funds loaned by the Federated Malay States Government, and will be operated by the Siamese Railway Department. It is intended, at the opening of the line for through traffic in April next, to commence with a weekly express service in either direction, the journey from Penang to Bangkok occupying 36 hours.

RAILWAY PROGRESS IN JAPAN.—The Imperial Railway Board of Japan is now contemplating the construction of 28 new railway lines, with an aggregate length of 1,135 miles, an increase of nearly 20 per cent in the present mileage under Government operation. The cost will be approximately 179,160,000 yen (£18,000,000 or \$87,500,000). A report of N. S. Marshall, manager of the Yokohama branch of the International Banking Corporation, states: "Last year an investigating committee was appointed by the Okuma Cabinet to study the possibility of converting the entire railway system of Japan from a 3 ft. 6 in. gage to the standard 4 ft. 8 in. This could be accomplished only with a huge outlay, as tunnels, bridges, stations, and practically the entire present equipment would have to be altered or replaced. Greater speed and carrying capacity are urgently needed, due to the requirements of new industries; for over a year there has been a great congestion of freight at the big commercial centers. On one of the regular lines a stretch of 4 ft. 8 in. track is being laid down on the same sleepers which bear the narrower gage. A special locomotive is being constructed and tests are to be made (with the cars now used) as to the increased speed and hauling capacity of the wider gaged engine, as well as to determine whether it will be possible to put down the 4 ft. 8 in. track without changing the 7 ft. sleepers."

Railway Financial News

CHICAGO & EASTERN ILLINOIS.—The sale of this company has again been postponed to take place at Danville, Ill., on November 4.

CHICAGO, ROCK ISLAND & PACIFIC.—Nathan L. Amster has sent out circulars to stockholders of the road announcing his intention of soliciting proxies for the election of directors at the annual meeting next month. The circular was in the form of a report on the progress made by the minority stockholders' committee. "We are arranging today," says the circular, "to send out about 1,400 checks to the Rock Island stockholders, returning to them the amount of their voluntary contributions which they sent my committee to help defray its expenses during the last two and a half years. In returning to the stockholders every cent that they sent the committee I will be out about \$9,000 in cash, which I incurred in out of pocket expenses during the two and a half years of the Rock Island campaign, but for which I have no way of procuring vouchers. One cannot ask for a receipt for every dollar he spends in connection with a work like this lasting nearly three years. It is interesting to point out in connection with this two things that have never been done before: That 1,400 stockholders should respond with voluntary contributions of from \$2 up, amounting to \$32,570. That every cent contributed by these stockholders should be returned to them in full. However, the Rock Island stockholders have accomplished in their fight quite a number of things that heretofore seemed impossible—as for instance: The forcing of the Wallace committee to distribute the shares pro rata to the collateral bondholders instead of selling the entire block of stock at auction and making a distribution of the cash resulting from such a sale, which everyone admits would have been very small, especially at a time in 1914 when the stock exchanges were closed, and when there was no market for even the most gilt edged security. Preventing the powerful Peabody committee from forcing a sale of the property under the refunding mortgage, etc. We have still, however, work on hand in the final contest at the coming annual election on October 11, to see that stockholders elect a board of directors representative of themselves, who will conduct the affairs of the company in their interest, and not, as in the past, in the interest of individuals with small, if any, holdings of stock."

GULF, MOBILE & NORTHERN.—See the Meridian & Memphis Railway below.

HOCKING VALLEY.—The Ohio Public Utilities Commission has approved this company's application for authority to issue \$5,000,000 of 6 per cent gold notes to run one year, maturing November 1, 1919, to be sold to pay and refund an issue of \$4,000,000 5 per cent notes, maturing November 1, 1917, and to pay for improvements made.

MERIDIAN & MEMPHIS.—This 33-mile line extending from Meridian, Miss., to Union, was recently sold to the Gulf, Mobile & Northern.

MISSOURI, KANSAS & TEXAS.—See editorial comments elsewhere in this issue.

NEW YORK, NEW HAVEN & HARTFORD.—Vice-president Edward G. Buckland has stated that a proposition for an issue of \$45,000,000 of 7 per cent preferred stock will be submitted to the stockholders at their annual meeting in October. The proposed stock issue is to meet the road's outstanding \$45,000,000 of 6 per cent short-term notes which fall due next May.

SEABOARD AIR LINE.—The National City Company and the Guaranty Trust Company are offering at 98 and interest, to yield slightly more than 7 per cent, the \$4,000,000 two-year 6 per cent notes of this company. The notes are secured by the deposit of \$5,334,000 of the company's first and consolidated bonds. They are dated September 15, 1917, and mature September 15, 1919.

Railway Officers

Executive, Financial, Legal and Accounting

C. G. Nelson has been elected secretary and treasurer, and appointed auditor of the Chicago, Milwaukee & Gary, with office at Rockford, Ill., vice W. F. McSwiney, resigned.

The election of J. M. Herbert, first vice-president in charge of the St. Louis Southwestern, at St. Louis, Mo., as president of that road to succeed Edwin Gould, is commented on elsewhere in this issue.

C. S. DuBelle, assistant treasurer of the Susquehanna & New York at Williamsport, Pa., has been elected treasurer of the Susquehanna & New York and the Tionesta Valley, with office at Williamsport, vice F. E. Bradley, and A. H. Bloomfield succeeds Mr. DuBelle.

Operating

L. V. R. Clum, chief clerk in the car record office of the Erie at New York, has been appointed assistant superintendent of transportation, with headquarters at New York.

W. C. Griffin, car accountant of the Georgia & Florida and the Augusta Southern, at Augusta, Ga., has been appointed superintendent of car service, and his former position has been discontinued.

H. R. Manby, acting superintendent and engineer of the Tennessee Central, at Nashville, Tenn., has been appointed superintendent and engineer; T. W. Burk has been appointed inspector of transportation. Both with offices at Nashville.

J. R. Stemm and D. J. Clark, trainmasters on the Chicago, Indianapolis & Louisville, have been appointed superintendents of the northern and southern divisions respectively, with headquarters at Lafayette, Ind., effective September 7. They succeed W. H. Fogg, promoted, who had jurisdiction over both divisions.

N. E. Stock has been appointed trainmaster on the Atchison, Topeka & Santa Fe at Needles, Cal., succeeding E. E. McCarty; W. E. Arntz has been appointed trainmaster of the San Francisco Bay Terminals, with headquarters at San Francisco; A. C. Haskell, trainmaster at Newton, Kan., has been transferred to the Oklahoma division, with headquarters at Arkansas City, Kan., succeeding A. A. Gist, transferred; A. T. Class has been appointed trainmaster, with headquarters at Newton.

J. C. Dobbie has been appointed acting general manager of the Guayaquil & Quito Railway, with headquarters at Huigra, Ecuador; and M. W. Jones has been appointed superintendent of traffic and transportation, with headquarters at Huigra. Mr. Jones entered the service of the Guayaquil & Quito in 1909 as secretary to the vice-president, and subsequently served consecutively as secretary to the president, chief train dispatcher, trainmaster, chief clerk to the general manager, acting paymaster, general freight and passenger agent, and superintendent of telegraph and telephone.

Traffic

Frank C. Keen, Jr., has been appointed commercial agent of the Georgia Coast & Piedmont, with office at Brunswick, Ga.

Howell Peoples, commercial agent of the Southern Railway at Baltimore, Md., has been appointed commercial agent at Washington, D. C., vice C. C. Baggett, assigned to other duties.

G. H. Ingalls, freight traffic manager of the New York Central, Lines West of Buffalo, is now traffic manager, and James Webster, assistant freight traffic manager, is now freight traffic manager. Both with headquarters at Chicago.

Carl Howe, manager of the New York Central Fast Freight Lines, has been appointed traffic manager of the Michigan Central; P. J. Findlay, assistant manager of New York Central Fast Freight Lines, has been appointed general freight agent of the Michigan Central, with office at Detroit, Mich., and F. O. Stafford, general west bound agent, has been appointed manager of the New York Central Fast Freight Lines, with headquarters at Chicago.

J. H. Reagan, agent of the Lehigh Valley, at St. Paul, Minn., has been promoted to commercial agent, with office at Minneapolis, Minn., succeeding M. P. Smith, who has resigned to go into other business. G. B. Peterson, representative of the Lehigh Valley-Nickel Plate Fast Freight Line, at Minneapolis, succeeds Mr. Reagan.

H. E. Everheart, agent at San Angelo, Tex., has been appointed division freight agent of the Atchison, Topeka & Santa Fe, with headquarters at Beaumont; Dwight V. Jones, freight and passenger agent at Washington, D. C., has been appointed general agent of the freight and passenger departments, with the same headquarters.

D. McNamara, district passenger agent of the Chicago & Alton at Indianapolis, Ind., has been appointed general agent of the passenger department with headquarters at New York, succeeding Frank Bowman, resigned to enter military service. T. M. Sommers, district passenger agent at Denver, Colo., has been transferred to Indianapolis. C. S. Brawner, special passenger agent at Kansas City, Mo., has been appointed district passenger agent, with headquarters at Denver.

Engineering and Rolling Stock

W. J. McLean, for the past five years master mechanic of the Kettle Valley at Penticton, B. C., has resigned.

G. O. Hammond, who has been appointed general mechanical superintendent of the New York, New Haven & Hartford with headquarters at New Haven, Conn., as has already been announced in these columns, was born on April 20, 1874, in New York City. He graduated from the New York public schools and from Stevens Institute of Technology, where he received the degree of mechanical engineer. In November, 1898, he began railway work as a special machinist at the Susquehanna shops of the Erie Railroad. He subsequently served as special apprentice until December, 1899; then as draftsman to 1901, and during the following year served as engineering clerk. He was general foreman of the Meadville shops until 1903, and later served as machinery inspector until 1905, and as chief draftsman from January to July, 1905, when he became mechanical engineer. He subsequently served as assistant mechanical superintendent and assistant to general mechanical superintendent until January, 1909, when he became mechanical engineer for the New York Air Brake Company. From February, to April, 1913, he acted as assistant superintendent on the New York, New Haven & Hartford. From May, 1913, to May, 1917, he was assistant mechanical superintendent and then was appointed assistant general mechanical superintendent, which position he held until his recent appointment as general mechanical superintendent of the same road.

O. B. Lackey, resident engineer of the Southern Railway System at Old Fort, N. C., has been promoted to supervising engineer, with headquarters at Washington, D. C., vice M. P. Northam, resigned to accept service elsewhere.

J. M. Salmon has been appointed bridge engineer of the Louisville & Nashville, with headquarters at Louisville, Ky., succeeding F. A. Busse, resigned to enter military service as a captain in the Engineer Officers' Reserve Corps, U. S. army.

A. B. Ogilvie has been appointed road foreman of engines of the Grand Trunk, with jurisdiction over Thirty-first and Thirty-second districts, including Ottawa terminal, vice W. M. Cooper, assigned to other duties, and E. S. McMillan has been appointed road foreman, Montreal terminals, vice F. H. Holland, assigned to other duties.

F. F. Gaines, superintendent of motive power of the Central of Georgia at Savannah, Ga., has been granted leave of absence on account of illness, effective September 8, and William H. Fetter, general master mechanic at Savannah, has been appointed acting superintendent of motive power.

Purchasing

John E. Byron has been appointed general storekeeper of the Boston & Maine, with office at Boston, Mass.

T. S. Edgell has been appointed division storekeeper of the Mobile & Ohio, with office at Tuscaloosa, Ala., vice W. O. Jamison, resigned.

J. A. Brackett, division storekeeper on the Atchison, Topeka & Santa Fe at Barstow, Cal., has been transferred to Calwa, succeeding O. H. Hansen, resigned to enter military service. Bayless McCain has been appointed division storekeeper at Barstow. H. R. Spann, division storekeeper at Riverbank, has been transferred to Gallup, N. Mex., succeeding G. O. Hixon, transferred to Winslow, Ariz., vice E. J. Burns, assigned to other duties. J. L. Diessl has been appointed division storekeeper at Riverbank.

Railway Officers in Military Service

F. A. Busse has resigned as bridge engineer of the Louisville & Nashville, with headquarters at Louisville, Ky., to enter military service as captain in the Engineer Officers' Reserve Corps, United States Army.

L. P. LeBron, assistant engineer of the Ft. Smith & Western at Ft. Smith, Ark., has been given an indefinite leave of absence to assume his duties in the Officers' Reserve Corps in which he has received a commission as captain.

C. W. Cochran, who resigned as engineer maintenance of way on the Cleveland division of the Cleveland, Cincinnati, Chicago & St. Louis last March, has received a commission as captain in the Engineer Officers' Reserve Corps, and is serving on the staff of the chief of engineers, Director General of Railways Department, U. S. Army, at Washington, D. C.

OBITUARY

Elliott T. Monett, general western passenger agent of the New York, Ontario & Western, with headquarters at Chicago, died at his home in Chicago on September 10.

J. F. Enright, superintendent of the motive power and car department of the Denver & Rio Grande, whose death on September 4 was announced in the *Railway Age Gazette* of September 7, was born at Savannah, Ga., in 1867. He entered railway service in 1885 as a machinist apprentice of the Savannah, Florida & Western, now a part of the Atlantic Coast Line, and remained in the Savannah (Ga.) shops of that road until 1895, when he was appointed general foreman of the shops at Montgomery, Ala. He was subsequently general foreman of shops of the same road at Waycross, Ga., and later master mechanic at Montgomery, Ala. From January, 1902, to January, 1907, he was master mechanic on the Mobile & Ohio at Whistler, Ala., and from the latter date to December, 1909, was superintendent of machinery of the International & Great Northern at Palestine, Texas. From the time he left the I. & G. N. up to the time of his death he was superintendent of the motive power and car departments of the Denver & Rio Grande, with headquarters at Denver, Colo., and during a portion of that period had jurisdiction also over the mechanical department of the Western Pacific.



G. O. Hammond



J. F. Enright

Railway Age Gazette

Volume 63

September 21, 1917

No. 12

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There is in the official family of every railroad a man the importance of whose duties has in a great many cases been overlooked. He is the road foreman of engines. Too often he is sidetracked from his work of educating and supervising the work of enginemen and assigned to special work which could be

done as well by others who have less important duties to perform. The demand for power and the extremely high prices for fuel, demand that both the engines and the fuel be made to produce the greatest possible amount of work. The place for the road foreman is on the road to see that this is done. He should not be given too large a territory; in fact, his territory should be reduced and new road foremen added so that the increased number of trains can be properly covered and the new men that are being placed on the locomotives can be properly instructed. With the demand for the more effective use of power the road foreman has become a more important member of the operating department. He is in a position to save considerable money for his road and to serve his country by increasing the efficiency of our great transportation system. His work is on the firing line and it is there he can do the most good.

"Cut out the elementary stuff!" This sharp admonition was addressed to the members of the National Safety Council at their meeting in New York last week, after some rather lengthy papers had been read. The words were noticeable because—not alone in this but in some other railroad associations—so many

members feel the need of such cutting but are too modest to suggest it. In this case the speaker was W. C. Wilson, formerly claims attorney of the Delaware, Lackawanna & Western, but now in private practice. Mr. Wilson always was plain spoken; but yet it is pertinent to observe in this place that the man who has left the railroad service often is the one who has a special mission (or at least a fine opportunity) to tell railroad people some things which they ought to be told but which, because of conventional modesty, tend to go forever unsaid. "You men are experts," said Mr. Wil-

son; "you cannot afford to spend your time on so many things already well known; concentrate on those difficult questions which cannot be settled at home, but on which light may be turned by specific discussion here." The report of the meeting, in this issue, will be found to cover a wide range of details. It is noticeable that "safety first" is not so common a phrase as it used to be. It is safety all the time. These specialists no longer deal so much in phrases. They act. For example, the motion-picture show on the New York Central is not a mere entertainment; attendance by employees is compulsory. That road believes it profitable to have a safety specialist (devoting his whole time to the work) on every division; and that is now the company's policy.

Some time ago Colonel Charles D. Hine wrote an article for the *Railway Age Gazette* advocating simplified station

accounting. It called forth some discussion from men in the accounting department, the principal objection to it being that under Colonel Hine's plan no adequate check was had on the

agent. The Boston & Maine has now adopted a method of auditing which actually in practice simplifies the work of the agent in making reports to the auditor of the freight revenue's office, and at the same time enables the auditor to have an actual daily balance with agents. Many roads have theoretically a daily balance with the agents, but in practice very often this is only a theoretical and not an actual daily balance. The Boston & Maine had been prior to March, 1917, on a monthly, manual basis of auditing freight revenue. It changed over to a daily basis, installing machines for doing much of the work that had heretofore been done by hand. The underlying principle adopted was to take away from the agent just as much of the audit office work as possible. Much of that which was taken away by the adoption of the new system had previously been done by the agent and then done over again in the audit office. At the larger stations it was in many cases possible to take off one man from the agent's force. At the smaller stations the agent, relieved of this work, properly

Safety all the Time

A Simplified Auditing Method

belonging to the audit office, has just that much more time for soliciting business, or for other duties which he had been in part neglecting. With the adoption of the new system it was possible to considerably reduce the number of persons employed in the auditor of freight revenue's office and the system has been in operation only since March 1. One of the great difficulties in having a reform adopted on a railroad, even when its advantages are obvious, is the reluctance felt by everyone affected to undergo the confusion and extra work of the transition period. It took a good deal of courage and a great deal of dogged persistence to get the new system in working order on the Boston & Maine and all the more credit, therefore, is due to those who actually went through the mill of making the change and to those who had the courage and foresight to authorize it.

RAILWAY OPERATING EFFICIENCY IN JUNE

OPERATING statistics for the month of June for railways having a total of 196,131 miles of line, which are just available, show a remarkable increase in operating efficiency as compared with June, 1916. The revenue freight ton mileage of these roads was 23 per cent greater than it was in June of last year; and they handled this largely increased tonnage with but one-tenth of 1 per cent more miles of line, 1.8 per cent more freight locomotives and 3.2 per cent more freight cars than they had last year. Perhaps what this really means can be best indicated by showing what were the increases in ton miles of freight per mile of line, per freight locomotive and per freight car. The following table gives these statistics for the United States as a whole, and for each of the three large territories—East, West and South:

	REVENUE TON MILES PER MILE OF LINE				
	United States	East	South	West	
June, 1917	165,600	315,500	151,800	98,300	
June, 1916	134,500	264,200	129,000	74,100	
Increase	31,100	51,300	22,800	24,200	
Per cent increase.....	23.1	19.4	17.6	32.7	

	REVENUE TON MILES PER FREIGHT LOCOMOTIVE			
	United States	East	South	West
June, 1917	1,182,000	1,326,000	1,091,000	1,048,000
June, 1916	977,000	1,129,000	944,000	807,000
Increase	205,000	197,000	147,000	241,000
Per cent increase.....	21.0	17.4	15.6	29.9

	REVENUE TON MILES PER FREIGHT CAR			
	United States	East	South	West
June, 1917	15,430	14,310	19,090	15,960
June, 1916	12,900	12,350	16,160	12,610
Increase	2,530	1,960	2,840	3,350
Per cent increase.....	19.6	15.9	17.5	26.6

It will be seen that the increase in freight traffic in the country as a whole per mile of line was 23 per cent; per freight locomotive, 21 per cent; and per freight car, 19.6 per cent. The increase in freight car efficiency was partly due to an increase in the average miles moved by each car daily from 27.3 to 29.1 miles; partly to an increase in the average load of loaded cars from 25.2 to 27.9 tons. The average miles made per locomotive per day increased from 65 to almost 78; the average tons per train from 642 to 715.

Relatively the largest increase in traffic took place in western territory, the total ton mileage exceeding that of June, 1916, by almost 33 per cent. This is reflected in the statistics of operating efficiency, the increase in traffic handled per mile of line in that territory being 32.7 per cent; per freight locomotive, 29.9 per cent, and per freight car, 26.6 per cent.

These increases in operating efficiency are truly extraordinary. They illustrate strikingly what American railways can do when they are allowed to work together without fool-

ish interference under the anti-trust law, and when they are able to get the cordial co-operation of most of their employees and of the shipping public.

Freight traffic continues to increase, the increase in June being the largest yet recorded in any single month, and in addition the passenger business now being handled probably is the largest ever known. How long can the railways continue to augment their efficiency enough to meet the demands upon them? The results they have secured already are greater than any but the most hopeful anticipated; and in view of what they have done already, there seems more ground for optimism regarding how they will get through the next fall, winter and spring than there ever was before.

MISSOURI, KANSAS & TEXAS AND ST. LOUIS-SAN FRANCISCO

THE St. Louis-San Francisco has been out of the hands of the receivers since November, 1916, and the Missouri, Kansas & Texas is now in the process of reorganization, the road being operated by a receiver. There has developed a rather wide difference of opinion as to what interest charges should be placed upon the Missouri, Kansas & Texas in the reorganization. Naturally comparisons with other roads have been used pro and con in the reorganization negotiations. There are hardly any two roads in the United States which are so nearly alike in operating conditions, traffic, etc., as to permit of a point to point comparison without qualifying analysis. Certainly the Missouri, Kansas & Texas and the St. Louis-San Francisco are not so much alike as to permit of such an unqualified comparison. On the other hand, it is interesting and not unprofitable to place the figures for one road against those of another even if it serves no other purpose than to call to each man's mind explanations of differences or similarities.

It may be said at once that the interest charges on the reorganized St. Louis-San Francisco are higher than any one interested in the Missouri, Kansas & Texas reorganization proposed to place on that property. They amount to \$1,618, whereas the higher figure which has been advocated for the Katy is \$1,159 per mile and the lower figure \$998 per mile.

It should be mentioned here that the St. Louis-San Francisco is making a very good showing indeed, having gross in the calendar year 1916 amounting to \$52,699,000, and after paying expenses, taxes and rentals it had \$14,638,000 available for interest, whereas the capitalization of the new company calls for \$8,506,000 fixed interest, \$2,322,000 cumulative interest and \$2,112,000 interest on income bonds. The company therefore earned \$1,698,000 above all three classes of interest charges.

The St. Louis-San Francisco operates 5,265 miles; the Missouri, Kansas & Texas 3,865 miles. The main north and south lines of the two systems serve the same territory, as will be seen from the map; but a list of mileage by states is illuminating:

State	St. L.-S. F.	M. K. & T.
Alabama	132	—
Arkansas	601	—
Louisiana	601	19
Kansas	630	494
Missouri	1,720	543
Mississippi	143	—
Oklahoma	1,408	1,036
Tennessee	18	—
Texas	505	1,273

It is apparent that the Katy has no line comparable to the Birmingham line of the Frisco, and this fact will be emphasized in a comparison of commodities carried. It will be noted that the Frisco has only about as much mileage in Texas as the Katy has in Missouri, while the Katy has as much mileage in Texas as the Frisco has in Missouri. This should be borne in mind especially when discussing comparative costs of injuries to persons and loss and damage payments. The Frisco has somewhat larger mileage in Okla-

homa and the Katy was comparatively a late comer in that state.

In 1916 the Frisco carried 21,270,000 tons of freight, and the Katy, 11,126,000 tons. The fact that there is no such contrast as this between gross operating revenues per mile (Frisco earned \$10,106 per mile in 1916 and the Katy \$9,504 per mile) is explained by the longer average haul of freight on the Katy—217 miles—as compared with the Frisco—174 miles. A contrast of the tonnage of the different commodities carried explains in part differences in average trainloading and resulting differences in transportation expenses:

Commodities	St. L. S. F.	M. K. & T.
Agricultural products	3,317,000	2,453,000
Animal and animal products	702,000	352,000
Products of mines	8,640,000	4,531,000
Lumber and forest products	3,067,000	842,000
Manufactures	4,137,000	1,938,000
Miscellaneous	353,000	211,000
L. C. L.	1,034,000	598,000

The Alabama line of the Frisco accounts in good part for the much larger coal and ore tonnage which permits of heavy

which can be used to fill out engine ratings and is therefore of great help in bringing up the average trainload. The Katy badly needs a northbound drag tonnage traffic. Both roads reach Kansas City and St. Louis; Oklahoma City, Okla.; Sherman, Tex.; Dallas, Tex., and both roads serve in general the territory between Kansas City and Dallas. The St. Louis-San Francisco serves Springfield, Mo.; Memphis, Tenn.; and Birmingham, Ala., a territory not reached in any part by the Missouri, Kansas and Texas. On the other hand, the Katy reaches Waco, Austin, San Antonio, Houston and Galveston and has a line from Dallas to Shreveport.

The Frisco's financial results for the year have been mentioned. The Missouri, Kansas & Texas earned \$36,734,000, an increase over the previous year of 13 per cent, and after paying expenses, rentals and taxes, had \$5,443,000 available for interest. The Frisco operated on a ratio of expenses to gross earnings of 67.11, while the Missouri, Kansas & Texas had an operating ratio of 80.14 per cent. A very considerable part of the difference in operating ratio is ex-



The Missouri, Kansas & Texas and the St. Louis-San Francisco

loading and is therefore a factor in favor of the Frisco in trainloading. The Frisco gets into the lumber country; the Missouri, Kansas & Texas, except its so-called orphan lines, does not get into the lumber country. This is an even more important factor in trainloading than the difference in tonnage of coal and ores. Much of the lumber is not only susceptible of heavy carloading but is drag freight northbound,

plained by the much heavier maintenance of way and maintenance of equipment expenditures of the Katy. That company spent \$7,630,000 on its 3,865 miles of line in 1916 for maintenance of way, while the Frisco spent \$7,403,000 on its 5,250 miles of line. The Katy spent \$7,274,000 for maintenance of equipment; the Frisco, \$9,703,000. There can be little doubt that during 1916 the receiver of the Katy

was taking up delayed maintenance. This was true for both maintenance of way and maintenance of equipment, and in addition there was \$2,286,000 spent on capital account, the largest items being for grading, bridges, rail and ballast. The Frisco went through its period of rehabilitation before it was taken out of the hands of the receiver. A list of improvements is included in the Frisco's annual report, but the amount charged to capital account for such improvements is not given.

In the estimates which have been made of the Missouri, Kansas & Texas future earning power a reduction in transportation costs per ton-mile figures prominently. The St. Louis-San Francisco's ratio of transportation expenses to gross earnings in 1916 was 31.48, comparing with 32.88, the ratio in the previous year. The Missouri, Kansas & Texas transportation ratio in 1916 was 33.74 as compared with 34.99 in 1915. Transportation expenses are not divided in the annual reports of either road as between freight and passengers, but it is interesting to make a rough comparison of transportation costs based on total train mileage because there are two distinct methods of approach in attempting to lower the transportation cost on the Katy. One is to increase the trainload, the other to decrease the costs per train-mile. Very roughly, the Katy had in 1916 15,000,000 train-miles, including both passenger and freight, and the Frisco, 22,000,000. There is some duplication of mixed train-miles in both figures. The Katy's transportation cost per train-mile averaged 82 cents; the Frisco's, 77 cents. The ratio of train-miles on the two roads is, roughly, as 3 is to 4.5.

Applying this ratio to the details of transportation expenses, most of the Katy's expenses are as low, and in some cases lower, than the Frisco's, with three notable exceptions: Fuel, loss and damage, and injuries to persons. Water also costs the Katy more than it does the Frisco. Injuries to persons cost the Katy \$634,000 in 1916 as contrasted with \$524,000, the cost on the Frisco. Loss and damage to freight cost the Katy \$393,000, and the Frisco very slightly less. The larger mileage in Texas in some part explains this contrast. Texas awards against railroads are notorious; but making full allowance for that fact, the Frisco is showing remarkably good results of its efforts to reduce loss and damage claims and claims on account of injuries to persons. It may be that the claims paid by the Katy in 1916 included not only the normal proportion of awards for accidents and losses in the immediate preceding years, but also a certain amount of taking up of delayed payments of awards. At any rate, the Katy is conducting a vigorous safety first campaign now and in a year or two it is not unfair to expect some betterment.

Very roughly, the fuel for train locomotives costs the Katy 17.7 cents per train-mile, and the Frisco, 12.9 cents. There are numerous points of difference between the two roads that would account for a variation in fuel costs. The Frisco has some very steep grades and, on the average, lighter locomotives, and there are many other things that could be mentioned, but as near as can be told from the available data, there is in general an indication that the Frisco is getting cheaper fuel as measured in train-miles than the Missouri, Kansas & Texas, and this actually bulks large in the final results as shown in the income account for the year. The St. Louis-San Francisco has for a number of years had a fuel department which has been given the authority and has taken the responsibility for conservation of fuel, and the results which were obtained in 1916 from almost any way of looking at it are a high compliment to the success of this department. J. W. Kendrick, one of the experts who made a report on the Missouri, Kansas & Texas for use in the reorganization, figured that \$500,000 could be saved on the Katy by a change in methods of handling fuel and the establishment of a fuel department. There is no method of judging the accuracy of Mr. Kendrick's figure, but it would appear

as if the Frisco, which had established such a department, was showing results that would appear to justify its existence. In comparing train-mile transportation costs it should be pointed out, of course, that the Frisco and the Missouri, Kansas & Texas do not have the same proportion of passenger train mileage to total train mileage. The Katy's passenger train mileage, including mixed train mileage, was 8,029,000, and the freight train mileage, also including mixed train mileage, was 7,144,000. The Frisco passenger train mileage, excluding mixed, was 10,065,000, and the freight, excluding mixed, was 10,551,000.

Stress is laid in the Kendrick report on the Katy on the possibilities of increasing the trainload. Ever since the present management took hold of the Katy, persistent and well thought out efforts have been made to increase the trainload. In 1916 the trainload of revenue freight averaged 338 tons; on the Frisco the average for revenue freight was 337 tons. Including company freight, the Katy's trainload was 409 tons and the Frisco's 396 tons. The total trainload of the Katy increased a little over 38 tons, or 10 per cent, as compared with the previous year, and the Frisco's trainload increased a little less than six tons, or between one and two per cent. The Frisco has considerably lighter engines on the average than the Missouri, Kansas & Texas. On the other hand, the older engines of the Missouri, Kansas & Texas are a pretty poor lot. The average weight on drivers for the Frisco engines was 69 tons, and the Katy's, 71 tons. The Katy has 105 comparatively new Mikados. It also has, however, in freight service 204 Moguls. The Frisco has in service 353 ten-wheel locomotives and 212 Consolidations. The company is now receiving, however, from the builders, 60 new Santa Fe locomotives for freight service and 10 Pacific locomotives for passenger service. When these engines have all been delivered the average weight on drivers for the Frisco's locomotives will be 73.7 tons.

It may be a considerable time before the Katy can get any large number of new modern locomotives to replace its Moguls. The increase in trainload in recent years has been in part due to better supervision and in part to the heavier locomotives. The increase which the road should show, however, in the next few years is in good part dependent on traffic developments. If the road can build or get a connection between its main lines and its two "orphan lines" there is the possibility of developing considerable lumber traffic. This would help the average trainload greatly, but it would mean the expenditure, presumably, of considerable capital amounts. Under the handicap of recent traffic conditions the Katy's showing, an increase in trainload from 266 tons in 1911 to 409 tons, is thoroughly creditable. The Frisco may hope to get a better trainload after its new locomotives have been broken in.

The following table shows the results of operation for the Katy in the calendar year 1916 and 1915, and for the Frisco for the calendar year 1916 with such comparisons for 1915 as are available:

	M. K. & T. 1916	Frisco 1916	M. K. & T. 1915	Frisco 1915
Mileage operated	3,865	5,256	3,865	.....
Freight revenue	\$24,795,720	\$36,555,444	\$22,142,576	.....
Passenger revenue	9,215,627	13,113,728	7,966,913	.....
Taxes	36,733,682	51,199,999	32,453,462	.....
Maintenance of way and structures	7,635,695	7,403,385	5,277,655	\$6,697,022
Maintenance of equip- ment	7,273,804	9,703,458	4,657,977	7,241,338
Traffic expenses	728,564	862,644	658,523	842,290
Transportation expenses	12,400,521	16,731,227	11,494,485	14,636,241
General expenses	1,169,910	1,671,426	1,047,282	1,221,665
Total operating expenses	29,439,701	35,646,779	23,223,816	30,372,891
Taxes	1,340,650	2,175,532	1,337,369	.....
Operating income	5,747,322	15,280,127	7,692,277	.....
Gross income	6,143,712	15,781,864	7,921,964	.....
Net income	\$1,134,634	\$6,131,976	\$514,881	.....
Surplus after payment of cumulative and income interest .....	.....	1,698,443	.....	.....

* After deducting interest charges on outstanding securities, including those in default as well as those which were paid.

† After deducting fixed interest charge only without any charge made for cumulative interest.

‡ Deficit.



The Fifteenth Engineers, Since in France, Pose in Front of Their Y. M. C. A. Tent at Camp Gaillard.

Y. M. C. A. Workers on 800 Trains to Cantonments

By This Step the Railroad Department Completes a
Y. M. C. A. Chain From Home to Front Line Trench

BY the time this is in print the movement will be under way of the second contingent of 40 per cent, or 194,800 men, of the National Army to the cantonments. These men will move in several hundred trains and on trips that will range from a matter of three or four hours to possibly 24 or 36 hours. On each and every train insofar as it is possible (and it is counting on accompanying 700 to 800 of them) the Railroad Y. M. C. A. will have a secretary or a member of his staff who will be of whatever service he can to the men. Through this important bit of work, the National Army men will first come in contact with the far reaching war work that is now being so energetically carried on by the Y. M. C. A. It is this link also that will complete the chain that will enable the Y. M. C. A. to keep in closest touch with the men who will go forth to uphold America's honor, from the time they leave their homes until they return victorious; or while they are on the train, in cantonment, or camp, on the train once more, in the embarkation port, on the transport, in London, in Paris and up to the fighting front.

The work which the Y. M. C. A. through its War Work Council, is now preparing to do for the men in olive drab, will therefore not by any means be confined to the National Army or National Guard cantonments or to camps for our forces overseas. There will be a lot to do between the time the men leave their homes and their arrival at the cantonments and at the time, when as trained men, they leave the camps to board the transports for their journey overseas. This particular part of the work is most important, and for the reason that it is a transportation matter, it is natural that it should have been placed in the hands of the Railroad Y. M. C. A.

In an article that appeared in the Patriotic War Number of the *Railway Age Gazette*, June 22, 1917, John F. Moore, general secretary of the Railroad Department of the International Committee of the Young Men's Christian Association outlined the part that the Railroad Department expected to take in the war work. Part of this program is already under way; other parts of it are now in preparation and await only the time of action.

The Railroad Department of the Y. M. C. A. did extremely good work among the National Guardsmen that were not so long since to be seen guarding railway bridges,

viaducts and tunnels. It filled a very important niche at the camps of the nine railway engineer regiments, and trained secretaries have since accompanied these railway regiments to France, where men and secretaries both are now getting into the swing of things. The Railroad Department also assisted materially and is continuing to assist considerably in the way of caring for the comfort of troops on their way to camp either as they pass through junction points or other important railway centers, or when they have to leave the trains and encamp for a time near a Railroad Y. M. C. A. The Railroad Department has representatives at important embarkation points to shake hands with the men and wish them *bon voyage*. As this is written, it is arranging to have secretaries on trains carrying men of the National Army to their respective cantonments, and by the time this is in print, no small amount of this work will have been done.

IN CAMP WITH THE RAILWAY ENGINEERS

When the nine railway engineer regiments were in camp near the several cities where they were recruited it was the Railroad Y. M. C. A. that supplied the men with writing paper, postage stamps, checkboards and other such conveniences. In cases where the regiments were not in buildings, a Y. M. C. A. tent was put up. A railroad secretary and his assistants at each camp attended to providing tables, chairs, a piano, and a phonograph. Classes in French were conducted. Many an otherwise tedious evening was sped quickly on its way by an entertainment arranged by this secretary, and many a Sunday afternoon was put to better uses by an interesting and well attended religious meeting.

Railroad officers keenly appreciated the work done by the Railroad Y. M. C. A. for the men in the engineer regiments from their railroads. "I was at the camp (of the Fourteenth Engineers at Rockingham Park, Salem, N. H.) many times," wrote President J. H. Hustis, of the Boston & Maine, "and saw what was being done. You can't overstate the benefits nor the results. The work of Secretary ———, loaned by the Railroad Association, is deserving of the highest praise. I am led to express on behalf of the executives of the railroads of New England,—and I think I can also speak for the men—their thanks for what was done."

The men in the engineer regiments can tell of many instances in which the Railroad Y. M. C. A. secretary helped

them over a rough spot. He sent money home for them; in a number of cases he helped men make their wills and in one of these latter cases, through the assistance of a railroad secretary in another city, he arranged also for an executor. These railwaymen are now in France, helping to construct, operate and repair railroads behind the lines. Trained secretaries have gone and more will go to continue the Y. M. C. A. work among them for the men will welcome the Railroad Y. M. C. A. there just as much and more than they welcomed it on their own home line. The first of the Railroad secretaries to go abroad was Frank G. Smith who is now in France. Mr. Smith has been with the Young Men's Christian Association for 12 years and served as railroad secretary at several New York points. He was later in charge of the Y. M. C. A.'s authorized by the government during the building of the Panama Canal and upon his return became social secretary at the New York Central Y. M. C. A. in New York City.



F. G. Smith

AT TERMINALS AND JUNCTION POINTS

The work that has been and is being done at terminals, junction points and other railroad centers consists principally of opening the association buildings to the men in uniform free of charge. They are granted the full use of tables, pens, ink and stationery, as also of the restaurant and baths. "Welcome, Soldier Boys. Everything We Have is Yours. Come in," said the big sign in front of the Y. M. C. A. across from the armory in one city, and, according to the reports, they certainly did.

This work of meeting the men at junction points will grow

Humphrey, general secretary of the Railroad Y. M. C. A. in that city. Dr. Humphrey has recently been made a member of the local committee of the Railroad's War Board at that point. Troop trains through St. Louis will probably not be passed through the Union Station but will be transferred from one railroad to another in some of the outlying railroad yards. Whenever it is possible, organizations and individuals will be afforded opportunity to distribute box lunches or other gifts among the soldiers and Dr. Humphrey will pay particular attention to looking after the welfare of the troops while the trains are being cleared through this gateway, and through him the work of the various organizations will be co-ordinated to the best advantage.

AT PORTS OF EMBARKATION

Perhaps one of the most interesting aspects of the work is that now being carried on at the ports of embarkation. The work of the Railroad Y. M. C. A. secretary on duty on the piers is uncertain to say the least, for he is very unlikely to know when the trains will arrive, or how many men they will bring until the trains are in; and then he must hustle with unseemly speed. On the other hand, he is just as unlikely to know when the boats will sail. Even with these handicaps, however, the secretary at the most important of the Atlantic Ports is making records every day. As soon as he hears that a train is in he immediately looks it up. If the men are likely to leave the train and wait at the station for a time, he will set up quarters, perhaps in the immigration room, for the railroads want to help him whenever they can. In some cases the men will move right



Dr. Rubens Humphrey



The Y. M. C. A. Encourages Outdoor Recreation

more important from day to day as the new contingents of National Army men go to their cantonments and as they and the members of the National Guard later leave the cantonments to go to the seacoast. The Railroad Y. M. C. A. is making extra efforts to see that the men are well taken care of. In St. Louis the work will be in charge of Dr. Rubens

on to the embarkation piers after a very short stopover. Perhaps they have not been fed for many hours. The secretary and his assistants promptly get on the job and secure sandwiches for them. In one case no less than 500 were served in 20 minutes, from the railroad station restaurant as it happened, and were sold to the men at cost price. This assist-

ance was certainly appreciated (by both the men and the regiment's commander) for the troops had not eaten for several hours and time was too short to allow them to leave.

A considerable part of this secretary's work comes when the men are at last on board the big transport. First, of course, he secures permission from the commanding officer to work among the men. Then armed with passes and permissions, and dressed in a field gray Y. M. C. A. uniform, designated by a red triangle inside a circle on the sleeves and

bye to some one. It is only a little thing, but a soldier going overseas feels much easier at heart for a last handshake, or the last "*bon voyage*."

FROM HOME TO CANTONMENT

The National Army will move to its cantonments, 5 per cent from September 5 to 9; 40 per cent from September 19 to 23; 40 per cent from October 3 to 7, and the remaining 15 per cent beginning October 17. The Railroad Y. M. C. A. is going to be on hand when these various contingents board their trains and a railroad secretary or a member of the secretary's staff will, if possible, accompany each and every train. He will be designated by an armband bearing the letters R. R. Y. M. C. A. and will have stamps and stationery, song sheets and magazines and little Protestant and Catholic Testaments, and possibly Hebrew prayer books.

In addition to supplying the prospective soldiers with these things, he will tell them something about the welfare work in the cantonments to which they are going and the name of the Y. M. C. A. secretary. The men will thus get their first introduction to the advantages of keeping in touch with the camp Y. M. C. A. work.

The pocket Testaments are not given out promiscuously, but only to interested men, who, seeing them, ask for one. They are well worth asking for, for they have been specially prepared for the soldier's use. The Y. M. C. A. at the camp in addition to its program of service to the men, will help to carry on the active religious work taking the place of that done by the churches at home; the Railroad Y. M. C. A. secretaries will therefore be the connecting link between the two. Both have a big work ahead of them, but any one who has come in contact with the enthusiasm that characterizes the Y. M. C. A. at the present time will have no doubt that its efforts will be highly successful and amply repaid.

RAILWAY STATION CAB TOLLS IN ENGLAND.—A long-standing difference between cabdrivers and the railway authorities came to a head recently when the London & Provincial Union of Licensed Vehicle Workers, acting on the instructions of their executive, issued a notice calling on all cabdrivers on and from August 1 to abstain from paying the penny cab toll demanded by railway companies from cabmen who ply for hire within London stations. On that date much inconvenience was caused to the traveling public, as the taxicab drivers refused to pay the penny toll demanded of them, and the ranks inside the stations were empty. Both the drivers and the railway companies express their intention not to give way. The latter say that the charge was fixed by the Home Secretary under an Act of Parliament in 1907, and was willingly agreed to by the cabmen of that day as a substitute for the old system of privileged cabs.

WAR SERVICE OF BRITISH RAILWAYS.—Apart from securing prompt and expeditious conveyance of traffic, the government has been assisted by the railways in a variety of other ways. Large numbers of railway-owned steamers have been taken by the simple expedient of commandeering; rolling-stock and permanent way have been sent overseas; railway workshops have been at the disposal of the state for the manufacture of munitions of war in great varieties; permanent way and other work in connection with munitions and other depots has been undertaken for the government by the railways. The services of various general managers and other officers have been placed at the disposal of the government for special duties (e. g. Sir Eric Geddes, K. C. B., Sir Guy Granet, Sir Sam Fay, Mr. Guy Calthrop, and others); over 150,000 railwaymen have been released for service with the colors, and generally every effort has been made to assist the government to the greatest possible extent.—*Engineering*, London.



Writing Letters and Catching Up With the News

the letters, R. R. Y. M. C. A., across the shoulder straps, he gets to work. He has specially printed stationery which is furnished to the men free of charge, post cards, stamps and writing materials. Very often when they are available he distributes magazines and books, and he does not have much of a job giving them away. When he puts them down on the deck, the scene that usually follows closely resembles a bunch of small street urchins scrambling for pennies. If the men are to be in the harbor for a time, he arranges an entertain-



The Y. M. C. A. Stages an Entertainment

ment and very often a religious meeting. He and his assistants help the men in many other ways.

One soldier wanted to send \$25 home to his wife. Still another soldier found out at the last minute that his mascot dog would be persona non grata in France; the secretary arranged to crate the animal and ship him home safely by express. The soldiers appreciate all these things, and most of all do they appreciate the chance to say good-

Byram to Succeed Earling as Head of St. Paul

His Will Be Great Task of Securing Hoped for Results From Pacific Coast Extension and Electrification

HARRY E. BYRAM, vice-president in charge of operation of the Chicago, Burlington & Quincy, will be elected president of the Chicago, Milwaukee & St. Paul at a meeting of the board of directors of that company the latter part of this month.

Mr. Byram will then have risen in eight years from the office of general superintendent of the Burlington lines West of the Missouri river to the position of chief executive officer of a great transcontinental system operating over 10,000 miles of line, and earning over \$100,000,000 a year.

While his rise has been rapid, there has been nothing adventitious about it. It has been partly due to the particular training and experience he has had, and partly to the ability and energy of the man himself. It was this combination which made him just the man that the controlling interests of the St. Paul road felt they needed when they decided that some change in management was desirable.

Mr. Byram's training and experience have been secured mainly on railways on which the policies and methods originated chiefly by James J. Hill have prevailed. Mr. Byram became a clerk in the office of the general manager of the Great Northern in 1898, and served in the operating department of that road until 1902, during which time he had risen to a superintendency. After spending two years on the Rock Island he went to the Burlington, which had then become a Hill property, and served first as general superintendent, and then as assistant to Daniel Willard, who was then vice-president in charge of operation. It was during this period that Mr. Hill was carrying out the reorganization and improvement of the Burlington system which was needed to enable it to operate in accordance with his ideas as to the way a railway should be operated.

Mr. Byram, since he became vice-president in charge of operation in 1910, has shown himself a worthy pupil of Mr. Hill and a fitting successor to Mr. Willard. Between 1901 and 1910 the Burlington's revenue ton miles had increased 92 per cent, while its average train load had been increased so much that its freight train mileage had increased but 1 per cent. Between 1910 and 1916 the average train load was increased from 381 tons to 575 tons, or over 50 per cent. In the same period the average tonnage per car was increased from 17 tons to 20.53 tons, or 21 per cent; and during the last year further large increases in carloads and trainloads have been achieved. In 1910, the ratio of operating expenses to earnings was 72 per cent. It has never reached that figure since, and in 1916 was only

60 per cent. The conducting transportation ratio in 1910 was 32 per cent; in 1916, only 29 per cent. The percentage earned on the common stock increased meantime from 13 per cent to 27 per cent; and surplus earnings in 1916 were almost three times as great as had ever been known before, being almost \$15,000,000. The showing made thus far in 1917 is even better than that for 1916.

These great advances in operating efficiency have been made possible by the exercise of great foresight in the development of the property and by the application of sound

principles in its general management by the two presidents under whom Mr. Byram has served since he has been vice-president — Darius Miller and Hale Holden. But they would not and could not have obtained without a strong man such as Mr. Byram at the head of the operating department. In fact, Mr. Byram has made himself recognized by the railroad fraternity during recent years as one of the most consummate masters of the entire art of railroad operation that the country has produced. His knowledge of the technique of railway operation is complete, and his ability to grasp and assimilate all the innumerable details of the business is extraordinary. He is physically strong, he takes good care of himself, and in consequence he is able to, and does, give to his work an amount of industry and energy that few men are capable of putting forth. An intense worker himself, he expects and receives somewhat similar

work from his subordinates all along the line. While Mr. Byram is so skilled as an operating man, he has taken a very keen and broad interest in all matters affecting railway management and the railway situation in general.

Mr. Byram not only knows how to operate a railway, but he has the vision and imagination necessary to see how a property should be developed in order that it may be successfully operated. In order to secure the good operating results which have been achieved on the Burlington, there was requisite not only careful supervision of carloading and trainloading, but even more reductions of grades, the construction of cut-offs, the development of sidetracks and terminal facilities, the acquisition of larger cars and more powerful locomotives, the maintenance of roadbed and equipment to high standards; and it has been largely due to the attention given to these matters that the Burlington has made a showing better than that made by the St. Paul, for example.

Meantime, Mr. Byram has taken great interest in all matters pertaining to the public relations of the railways.



H. E. Byram

He is a strong believer in giving the public good service at reasonable rates, and then tactfully but vigorously resisting all the attacks that are made upon them and answering all the misrepresentations that appear about them. While he has a great reputation as an operating officer, only those who have come into intimate contact with him realize the breadth of his knowledge of and interest in railway affairs of all kinds and also public affairs in general.

Mr. Byram is sometimes characterized as "cold," but the impression that he is so, insofar as it prevails, evidently is due to the fact that in his business relations he seems to act uniformly upon the principle that he is a trustee for his railroad, and that his main duty is to get the best bargains and the best results he can for its stockholders, consistent with fair treatment of others. As a matter of fact, he is personally extremely democratic, warm-hearted and companionable, and in consequence is very popular among the people who know him well.

The combination of training, experience, ability, energy, public spirit and personality which Mr. Byram possesses seems peculiarly to equip him for the presidency of the St. Paul at this time. The road offers him a great opportunity, and developments on it under his management will be watched with much interest. A man with his training, experience, and temperament is pretty sure to apply Hill methods of railroading and that seems to be what the St. Paul needs.

There is nothing fundamentally wrong with the road, with the strategic lines along which it has been developed, or with its operating organization. In fact, it has in its organization many very strong men. It does apparently need the application of certain principles and methods of development and operation which have been less in evidence in the St. Paul than on most of the more efficiently operated railroads in the territory; and Mr. Byram is the man to apply them.

Mr. Byram was born at Galesburg, Ill., on November 28, 1865, and entered railway service in 1881 as a call boy on the Chicago, Burlington & Quincy in the same city. He was later stenographer in the general superintendent's office and chief clerk to the superintendent of terminals of the same road at Chicago, Ill. From 1889 to 1894, he was out of railway service. From the latter date until March, 1898, he was with the Great Northern as clerk in the general manager's office and chief clerk in the vice-president's office at St. Paul, Minn., following which he was assistant general superintendent of the Montana Central at Great Falls, Mont., and from October, 1899, to October, 1902, superintendent of the Cascade division of the Great Northern at Everett, Wash. From Everett he went to Chicago to enter the service of the Rock Island. From October, 1902, to February, 1904, he was assistant to the first and fourth vice-presidents, of that road at Chicago, and from the latter date until July, 1904, was general superintendent of the southwestern district, with headquarters at Topeka, Kansas. He left the

Rock Island to become general superintendent of the Nebraska district of the Burlington, which position he held until May, 1909, when he was made assistant to the vice-president of operation. Since February, 1910, he has been vice-president.

ALBERT J. EARLING

Albert J. Earling, chief executive of the Chicago, Milwaukee & St. Paul for the past 18 years, who will retire from the presidency at a meeting of the directors of the road the latter part of this month, will be elected chairman of the board. Mr. Earling's entire railroad career of 51 years has been with the St. Paul—a record of continuous service with one road seldom equalled by American railroad executives. Beginning as a telegraph operator on the Milwaukee & St. Paul in 1866, he passed through practically every position in the operating department, becoming vice-president in charge of operation in December, 1895. His rise was steady but not rapid.

The fact that his entire railroad career has been with the St. Paul and that he became familiar, by virtue of experience, with the duties of each office in the operating department from the ground up, has proved of great advantage to him, giving him an unusually thorough knowledge of the property, the affairs of which he so long directed and a comprehensive grasp of the details of its operation. There is no department in which he has not taken a direct interest and there are few subordinate officers with whom he has not kept in close personal touch. He has pursued a policy of personal supervision seldom attempted by the president of so large a property.

The Milwaukee & St. Paul, as it was then known, was organized only three years before Mr. Earling entered the service. When it assumed its present name in

1874 it had about 1,400 miles of line. When Mr. Earling became president in 1899, it had 6,337 miles of line; and it now operates 10,510 miles.

Mr. Earling has launched two daring moves for the property since he has been president. The first, the construction of the Pacific coast extension, was undertaken in 1905 toward the end of a period of prosperity for the carriers and at a time when the epidemic of repressive railway regulation had not yet assumed appreciable proportions. The project was financed before the panic of 1907, and an ensuing period of low prices and low wages proved a favorable circumstance in carrying on the construction work.

The most spectacular undertaking of Mr. Earling's career probably has been the electrification of a large portion of the Puget Sound extension. This was begun in November, 1914, and although other roads had electrified small portions of their lines before that time, none had attempted a venture of such great magnitude. The first unit of 440 miles in the mountain country from Harlowton, Mont., to Avery, Idaho, was completed in February, 1917, and another unit is now in



A. J. Earling

progress of construction from Othello, Wash., to Seattle and Tacoma. It is unfortunate that most of the electrification work has been done in a period of rising prices, increasing wages and soaring interest rates.

When the Pacific coast extension was undertaken, trade in the Northwest was booming and an increasing business was being built up with the Orient and Alaska. The high expectations of traffic from these sources, entertained at that time, have not been realized. The extent to which readjustments in currents of trade at the conclusion of the world war will affect the situation is, of course, an uncertain matter; but while the result of the extension was the opening up of considerable areas of new territory for development, the long period of depression in the Pacific Northwest, which continued until recently, has had an unfavorable effect upon the St. Paul's results.

When Mr. Earling became president of the road in 1899 it was paying, and had been paying for nine years its fixed charges, dividends on its preferred stock, 5 per cent on its common and earning a good surplus. Its financial results so improved under his management that in 1901 the dividend on the common was advanced to 6 per cent, and in 1902 to 7 per cent. This rate was maintained to 1912. In the year 1906 and again in 1907, the surplus after dividends exceeded \$5,500,000.

From this time, however, it began to decline. In 1911 it had dropped to the negligible sum of \$127,000, and in 1912 there was a deficit after dividends of over \$5,000,000. In that year the dividend on common stock was reduced to 5 per cent, and it has been on that basis since. In 1913 a surplus exceeding \$4,000,000 was shown, and in 1914 there was a fair surplus, but again in 1915 there was a deficit after dividends of almost \$2,000,000. In 1916 the surplus exceeded \$3,300,000, but in the first six months of the calendar year 1917 the road's net operating income showed a decline compared with the same months of last year of almost \$1,400,000.

The increasingly unsatisfactory financial results have been due partly to conditions special to the St. Paul, partly to conditions affecting all railways in its territory. The increase in the road's fixed charges, due to the construction of its Pacific coast extension, to its investment in electrification, to grade revisions, and so on, has been large, the annual interest on its funded debt having advanced from \$5,800,000 in 1909 to \$8,500,000 in 1912 and to \$15,600,000 in 1916. While there has been a large increase, meantime, in total earnings, the advances in operating expenses and taxes have been so large that net operating income has not increased enough to offset the increase in fixed charges. The ratio of operating expenses to earnings in 1909 was 65 per cent. In 1912 it had increased to 75 per cent. In 1916, with the large earnings of that year, it was 65.43 per cent.

These general developments have given rise to increasing criticism of the St. Paul's management under Mr. Earling. The road's results have been compared unfavorably with those of other roads in its general territory, especially those of the Burlington. For example, in 1902 the average revenue trainload of the Burlington was 200 tons, that of the St. Paul, 237 tons. In 1915, however, the figure for the Burlington was 492 tons; that for the St. Paul, only 390; in 1916, Burlington, 558 tons; St. Paul, 425 tons. Transportation expenses of the St. Paul for the year were 36 per cent of its total earnings; for the Burlington, only 29 per cent. The total operating ratio of the St. Paul was 65.43; of the Burlington, only 60. The Burlington spent \$1,283 per mile for maintenance of way; the St. Paul, only \$1,133; the latter being a figure considerably below the average for the large granger roads.

The showing of the road and the criticisms it evoked caused the development of a sentiment among some of the strong interests in it, notably that represented by J. Ogden

Armour, that the road was not being satisfactorily managed. There was some question as to whether all the large investment made by it in improvements in recent years had been well adapted to securing the best operating and financial results, and there was a feeling that Mr. Earling ought to retire from the active administration of the property and give place to a younger and more energetic man, preferably one experienced and skilled in the Hill methods of railroad operation. Mr. Earling himself accepted this view, the result being the selection of H. E. Byram to succeed him.

The retiring president transformed a granger road of 6,000 miles into a transcontinental system of 10,000 miles; it is the task of his successor to develop the great possibilities of that system.

Mr. Earling was born at Richfield, Wis., on January 19, 1848, and entered railway service with the Milwaukee & St. Paul, now the C. M. & St. P., in 1866. For six years he was a telegraph operator, following which he was a train despatcher for five years, and assistant superintendent four years. From 1882 to 1884 he was division superintendent, and from the latter date until 1888 assistant general superintendent. During the ensuing two years he served as general superintendent and in 1890 he was promoted to general manager. He held this position for nine years and in December, 1895, was also made second vice-president. From September 23, 1899, until the present time he has been president.

WAR RECORD OF C. P. R. MEN.—In spite of the fact that the trains of the Canadian Pacific Railway, have been occupied in the transportation of soldiers and war materials, and that the huge workshops of the company have been turning out vast supplies of munitions of war instead of engines and rolling stock, no fewer than 8,000 men in the service of the company have gone to the front. In every theatre of war they are to be found—in France, Italy, Russia, the Balkans, Mesopotamia, Africa. Of these 8,000 men (apart from 100 who are serving in the Navy) 1,309 have been killed or wounded, among the killed being Capt. the Hon. A. T. Shaughnessy, son of Lord Shaughnessy, president of the C. P. R. The C. P. R. and Dominion Express staffs in Great Britain before the war numbered 213, of whom 179 were of military age, and of those 179 no fewer than 158 have joined the colors.

MIXED GAGES AT THE FRONT.—An interesting despatch, recently sent from the western front by H. Warner Allen, a British war correspondent, throws additional light on the German system of strategic railways close to the firing line. The underlying idea was the elimination of great accumulations of material in the immediate neighborhood of the lines, where they are exposed to the risk of bombardment, and it has been found possible to work on this principle as the result of utilizing an enormous amount of prisoners, mostly Russian. An adequate labor supply is essential, because such a system requires a very considerable labor force for transshipping in case of a sudden demand for a change from a standard to the narrow gage lines. Material is first brought up on standard gage lines, then transhipped to meter gage lines, and finally run on to the 60-cm. tracks (1 ft. 11½ in.) which feed the trenches. Huge junction stations have been laid out at centers where the different gages meet, and the finest of these is said to be at Ham, where there are two separate systems of standard and meter gage lines, capable of transshipping 3,000 tons a day. The Germans have made the greatest use of existing meter gage light railways, and to link these railway lines up with the standard gage main lines, mixed gage tracks have been provided. These are of two kinds; either a third rail has been laid on the standard gage lines or a meter track has been placed on the old roadbed.

System of Auditing on the Boston & Maine

Reports of Agents to the Freight Accounting Office Have Been Greatly Simplified. Daily Balances Obtained

AS the result of an investigation extending over a number of years, the Boston & Maine inaugurated, March 1, 1917, a simplified system of freight accounting on the daily report plan, which has resulted in a radical change in the methods heretofore in vogue on that road.

A review of freight accounting methods and a comparison of them with other accounting rules demonstrated that there was practically no relief to be obtained, either by the accounting department or at the station, from a revision of forms, it being shown very early in the investigation that freight accounting forms had been reduced to the lowest economical safety basis considering the purpose for which they were designed.

It was, therefore, decided to direct the entire energy of the investigation toward a satisfactory adaptation of current forms to a safe, economical plan of simplified accounting that

quirements of the station and the general office, were reduced to a carbon copy of the so-called cashiers' schedule.

[illegible]

Form of Agent's Schedule

This blank was made use of for the reason that it appeared necessary that this form should be made up currently

BOSTON AND MAINE RAILROAD <small>J. H. MORTON, Treasurer</small>																																																																																																				
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Abstract of Interline Way Bills Received Printed by the Powers Tabulator from Cards Punched on Powers Machine

would avoid duplication of labor wherever possible. By a process of elimination, the reports to be made by the freight station to the accounting department, considering the re-

each day at the station in order to obtain an accurate record of the debits and credits to the station account.

It was found that all of the other forms in use could be

[illegible]

omitted and a good and sufficient reason assigned for such omission in each case, but no satisfactory substitute could be found for the cashiers' daily schedule.

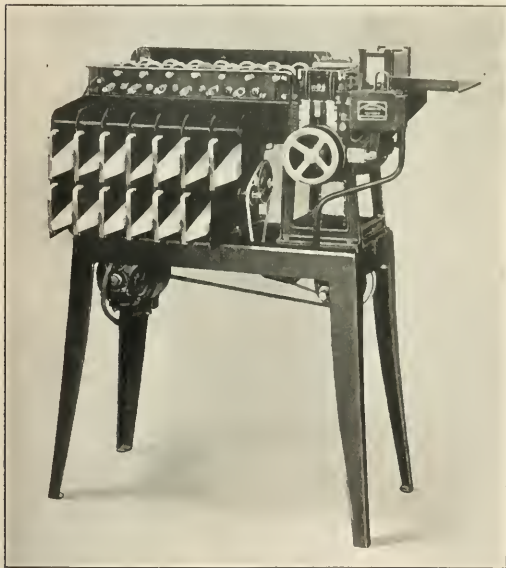
Having arrived at this point the effort was then made to change the cashiers' daily schedule sufficiently to make a



Key Board of Powers Card Punching Machine

carbon copy of it, satisfy the accounting department requirements, and at the same time not changing it in any way that would affect its efficiency, both in economy of time, labor and material, at the station.

During recent years it has become more and more appar-



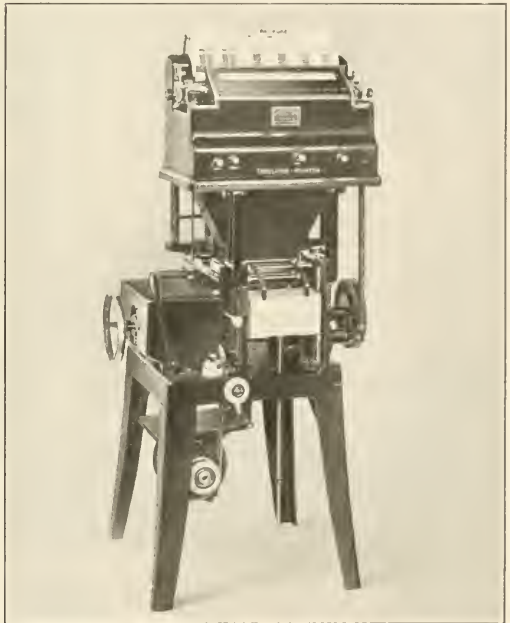
Powers Sorting Machine

ent that for statistical purposes the records of the accounting department must be used and, therefore, it has been increasingly evident that any statistics prepared at the station are a duplication, at least in part if not entirely, of records which are required for the same or other purposes in the accounting department.

With this in mind, it must be admitted that the station had very little interest in the tons, ton miles, commodity, or other statistical data. Therefore, if the station force is to accomplish the best results in the work properly assigned to it, relief must be given from reports of the above nature.

It is expected that the adoption of the daily report plan, detail of which follows, will accomplish that result and enable the station force to handle in a more satisfactory manner the duties required of it which, broadly speaking, are considered to be the solicitation, receipt and delivery of traffic, protection of the carriers' revenue and the proper consideration of the needs of the shipping public.

To accomplish the necessary results, machines such as manufactured by the Powers Accounting Machine Company, the Remington Typewriter Company and various calculating machine companies have been installed. The Powers system consists of three distinct types of machines, namely: The



Powers Tabulating Machine

punching or perforating machine; the sorting machine; and the tabulator-printer.

Tabulating cards $7\frac{3}{8}$ in. by $5\frac{1}{4}$ in. are used as a means of conveying information, such cards being specially designed to meet the requirements.

Waybills or copies of waybills are forwarded daily by the station freight agents to the office of auditor freight receipts. The data and information as shown on the waybills is perforated on the cards by the punching machine referred to. The perforated cards constitute the basis from which all subsequent operations are performed automatically on the sorting machines and tabulator-printers.

THE POWERS MACHINES

The blank, unpunched cards are placed in a magazine in the back of the machine and automatically fed after each punching by a raised edge about 0.005 in. high between the feeding rolls of the machine. The waybills or other data, from which it is desired to transfer the information thereon to the perforated cards, are placed on the rack above

and the operator sets the keys to the desired places indicating date, waybill number, station number, weight, freight charges, etc., presses a bar on side of machine, which trips the clutch, raises the dies and card holding mechanism against the punch and punches the entire number of holes desired at one stroke. After the die returns to the lower position the perforated card is automatically ejected into the front

moved forward in accordance with the position selected to its proper compartment. At the same time another card is fed from the magazine and the process repeated. The machine automatically stops when the last card has been selected and deposited in its proper compartment. Cards can be withdrawn from their respective compartments and additional cards placed in magazines without stopping the

(Road) (Route) (Month)			(Fwd) (Rec'd Sta)		(Waybill) (Com)		(Int Fwd) (Cars) (Wt. cwt)		(Frt)	(Adv)	(Pd)
17	2	J	773	200	204	0 0 0	1	56			
17	4	J	773	206	203	0 0 0	1	2 70			
18	6	J	773	210	202	0 8 8	2 40	86 00			
20	4	J	773	216	201	0 0 0	1	5 63			
20	4	J	773	216	200	0 0 0	56	11 19			5 88
20	4	J	773	216	200	0 0 0	51	21 52			11 19
20	4	J	773	216	200	0 0 0	1	6 44	227 60	9 00	41 34

Carbon Made by the Tabulating Machine

magazine, and at the same time another unpunched card automatically feeds into proper position for cutting and all keys return to their normal position so as to be immediately available to operator for the resetting of same to correspond with the information as shown on the following waybill. All naughts are punched automatically.

The sorting machine distributes or separates the punched cards in accordance with requirements as to sub-divisions,

machine. Cards can be assorted at the rate of approximately 300 cards per minute.

The tabulator-printer tabulates totals and prints them in conjunction with the designations of station or other group numbers directly upon a report or record; or, if desirable, the listing in detail of all items represented by the holes punched in each individual card.

The machine is easily operated, and the principle of

(Miscellaneous)					
(Day, Month)	(Station)	(Voucher Number)	(Account)	(Debit)	
18 3	633	134577	6 1	1 00	
18 3	633	134576	6 1	50	
18 3	633	144974	5 1	2 00	
				3 50	
18 8	619	23152	5 1	2 00	
18 8	619	23151	5 1	2 00	
18 8	619	23150	5 1	2 00	

Carbon of Miscellaneous

numerical sequence or classifications. Cards are placed in the magazine or hopper, being fed down by the pressure of the cards above. With each revolution of the machine a card is picked from the pile and passes under the guide plate. Over the guide plate, carried on a cross-frame, are 12 plungers which conform to the 12 horizontal digit positions on card.

When a card having a hole in any of the 12 horizontal

mechanical selection being practically the same as that of the sorting machine, excepting that it is provided with as many rows of pins as there are vertical columns upon the card to be selected. The card is divided into fields, and the rows of selecting pins are accordingly arranged so that they will select and effect the listing and addition of the columns comprising each separate adding field in the corresponding unit of the tabulator-printer. The selecting pins

730 REVISED

J. H. MUSTIS, TEMPORARY RECEIVER

ACCOUNTING CARD NO. 5

BOSTON AND MAINE RAILROAD

DAILY SCHEDULE OF DEBIT CORRECTIONS

AT *Portland Me.* STATION *(536)* FOR *August* 191*7*

DAY MO.	W/B NO.	REC'D STA.	FOU'D STA.	ROAD	A. F. R. NO.	ROUTE	NO.	SYMBOL	DEBIT OR CREDIT
1	6 00028	536			219411	23	7660	3	12617
25	5 00713	536			229158	23	7197	3	91
18	6 03034	536			214046	23	7218	3	1600
22	8 00042	536			214045	23	7397	3	25

Daily Schedule of Corrections Made on the Tabulating Machine

lines in the row under the plungers passes under the guide plate, the corresponding plunger drops through the hole setting the guide bar beneath, which diverts the card to the correct pocket. As soon as the tripping levers underneath have been set, the plungers rise out of the card and it is

act as human fingers and, according to the holes perforated* in the various columns or fields of each card, make simultaneously the corresponding selection of all the items to be listed or added internally within the accumulative section of the machine. To operate, the perforated cards are placed

in the magazine in practically the same manner as they are in the sorting machine. Each card is fed automatically into the proper selective position, and the mechanical selection accomplished, in accordance with the perforated information as indicated on card, as above outlined. Card is then automatically ejected into a receiving magazine, and the process repeated. A "total card" is placed between the cards for each station or sub-division, which actuates the total mechanism and automatically prints the totals accumulated to that point before proceeding with the tabulation of the subsequent group of cards in the magazine.

The machines are equipped with from five to seven adding units, each of which has a printing or accumulating capacity of nine figures; the selection, printing and adding upon all units being performed simultaneously.

Under the daily system plan, agents are required to render to the audit office daily schedules. These daily schedules comprise the following:

(1) Daily received schedule showing debit to the station. Both local and interline received waybills are reported on the same schedule under the proper caption.

(2) Advances forwarded schedule. All interline and local waybills carrying advance charges are reported on this schedule, amounts being separately listed as to local or interline in the proper column.

(3) Prepaid forwarded schedules whereon the agents list all the waybills carrying prepaid charges, separating the local from the interline in the proper columns in the same manner as outlined in connection with schedules one and two.

(4) Miscellaneous schedules whereon are reported all

HANDLING OF WAYBILLS

Original waybills, both interline and local, copies of waybills, both interline and local, are separated from the schedules either received collect, forwarded advances or forwarded prepaid, and are placed in the hands of a force of clerks for purposes of coding, which by the use of numerals expresses the station from and to billing or receiving road, route, commodity, etc.

This having been done the local received waybills and such foreign waybills as are designated to be handled by the Powers machines, together with the copies of forwarded local waybills bearing expense and prepaid charges, together with copies of all interline waybills are then passed to what is known as the key-punch section to have the information put on the cards as previously described.

Interline waybills from certain designated roads are passed to the Remington-Wahl (adding typewriter) operators who make individual abstracts covering each billing station, from and to, road and route, using what is known as a carbon cut-off which allows a proof sheet to be tabulated carrying all the information on one sheet that appears on the individual abstracts and allowing the operator when completing the abstracting of a station to accumulate immediately the total weight, freight, expense, prepaid and collect of each station.

LOCAL RECEIVED

A card form as shown is used for local received waybills. All of the information as shown is punched directly from the original waybills.

Stop or total cards are placed in the magazine of the

J. H. HUSTIS, Temporary Receiver													
BOSTON AND MAINE RAILROAD													
SUMMARY OF AGENTS DR. AND CR. SCHEDULES ACCT. OF FREIGHT TRAFFIC.													
STATION NAME <i>Bradleeboro, N. H.</i> MONTH OF <i>May</i> 1917													
DEBIT													
COLLECT RECEIVED		PREPAID FORWARDED		MISCELLANEOUS		DEBIT		VARIOUS		ADVANCES FORWARDED		CREDIT	
LOCAL COLUMN 1	INTERLINE COLUMN 2	LOCAL COLUMN 1	INTERLINE COLUMN 2	COLLECTIONS COLUMN 1	CORRECTIONS COLUMN 1	BEFORE DEBIT COLUMN 1	DEBITS COLUMN 1	LOCAL COLUMN 1	INTERLINE COLUMN 2	PREPAID RECEIVED COLUMNS 1 AND 2	CORRECTIONS COLUMN 1	CREDITS COLUMN 1	VARIOUS CREDITS COLUMN 1
1 115.24	6.45.43	3.20	1.00	43.84	41.24			2.13		7.58			
2 3.27.51	2.49.12	6.04.15	4.92	32.66				6.00		5.25		82	
3 5.50.44	3.48.14	3.46.53	72.53	35.42						2.51			
4 2.69.74	2.54.50	4.56.42	51.37	32.60	29.14			10.36	1.73				
5 65.26	1.52.60	1.60.35						6.00		5.33	17.47		271

Sample of Monthly Summary of Agents' Debits and Credits

miscellaneous charges which are not strictly chargeable to freight revenue account.

(5) Correction schedule whereon are reported all undercharge and overcharge corrections affecting waybills previously reported.

Schedules are prepared in skeleton form, showing date, waybill number, freight bill number, and total of waybill either collect, advances or prepaid, as the case may be. In addition to the above reports agents are required to forward to the audit office at the close of each month a monthly summary of debits and credits.

The following is a brief outline of the methods in force after receipt of the above described schedules in the audit office.

Original waybills are attached to the received collect schedules and carbon copies of waybills are attached to the advances and prepaid forwarded schedules, no report being made for waybills bearing freight charges only. These are enclosed in special envelopes and received intact at the audit office where a proper check is made to insure the prompt receipt of reports from all stations, and are uniformly stamped with the date received. The distribution of the various schedules, waybills and copies of waybills is then made to the various sections assigned to the performance of the work.

punching machines by the punch operators after each set of cards are cut from the waybills included on a schedule for each station. These cards then move to the tabulating machine operators and are tabulated showing all necessary information, such as station number, waybill number, commodity number, as well as weight, freight, advances and prepaid charges; the tabulator automatically printing the totals as represented by each station schedule. The tabulated sheets then move to a set of clerks designated as examiners, whose duty it is to audit the daily schedules against the figures as shown on tabulated sheets, and the necessary corrections are then made.

The tabulated sheets having been balanced against agents' schedules, the perforated cards are filed in station order in filing cabinets and remain in that order until the close of the month.

INTERLINE RECEIVED

Interline received waybills are handled by both the Powers machine and the Remington-Wahl typewriters.

The card form being used for such interline waybills as are handled by Powers machines is shown, and such waybills are handled in identically the same manner as local received waybills.

Waybills handled by the Remington-Wahl typewriters,

the proof sheet, as previously referred to, is key-punched on what is known as a master card, showing the receiving station, weight, freight, expense and prepaid charges, which represent the total of a day's business, and this master card is combined with the tabulations of the Powers machine covering any one station for the day, and the combined figures are used to balance the interline column of the schedule.

LOCAL FORWARDED

Only such local forwarded waybills as bear expense or prepaid charges are coded and key-punched.

It is not considered necessary to balance out daily or for any period of time the local forwarded charges as against received local charges. This system, however, permits the actual balancing daily or for a period of time, of the forwarded local expenses and prepaids against received local expenses and prepaids.

Cards having been key-punched are handled in identically the same manner as local received.

INTERLINE FORWARDED

Copies of all interline waybills after being coded and key-punched are handled in identically the same manner as local received.

RESULT OF OPERATION

The perforated cards and the tabulations made therefrom now represent by days the total local received, weight, freight, expense and prepaid charges, the total interline received, weight, freight, expense and prepaid charges, the total local forwarded expense and prepaid charges, the total interline, forwarded weight, freight, expense and prepaid charges and these cards filed in alphabetical order are held until the end of the month and the tabulations which represent the balance as between the machine operation and the agents' schedules are filed in station order and are held.

The various forms used to represent such miscellaneous charges as storage, switching, etc., are separated from the miscellaneous schedules and are handled in practically the same routine manner in the tabulating machine section.

At the close of audit month cards are sorted according to a miscellaneous charges classification and subsequent tabulations are made in conformity with established requirements.

CORRECTIONS

Under the new system instructions to agents provide that no corrections shall be included on daily schedules unless authorized by the audit office. The effect of this arrangement is to give the audit office complete control of the correction situation at all times. Waybills may be corrected before leaving the agent's office and reported on schedules on the basis of such corrected charges, attaching thereto copy of correction to sustain such corrected reporting; no subsequent reporting of corrections affecting waybills previously reported is permitted without the necessary authority from the audit office.

A card is cut for all corrections issued. These cards are listed in detail on the tabulator printers daily, and after proper checking of tabulated lists cards are assorted according to the station affected, they are also assorted as to undercharges and overcharges. A daily tabulation is then made on tabulator printers in duplicate. The original is sent to the agents together with a copy of correction with instructions to include total amount on his correction schedule of a certain date, duplicate statement being retained in the audit office to insure the agent's compliance with his instructions.

BALANCING

Recapitulation or master cards are cut daily for each station from printed tabulations of all detail cards, the

same card forms also being used for the punching of totals as shown on agent's schedules. A separate detail listing of these cards is made daily on the tabulator printer, the grand total of which must agree, thereby proving each day's work for the month.

Cards are separately filed in station order until the close of audit month and another listing is then made including the monthly balance which is also used as an audit of the agents' monthly summary of debits and credits.

This provides a very elastic method for balancing inasmuch as agents' accounts may be balanced by days, weeks, monthly, or for any period, and the agents' balance for any period of time must balance the combined local and interline account, both received and forwarded.

STATISTICS

All requirements as to daily and monthly statistics are for the most part obtained from the detail cards described.

The local received cards are taken from the file boxes, placed on the sorting machines, and are sorted in what is known as "station to station order," this giving a grand total as between each station on the line of the road, of the tonnage and freight charges, making it comparatively easy to insert the miles so as to arrive at the ton miles.

Interline received cards after being removed from the file cases are sorted in station order by junctions at which freight is received on the line of the road, in this way furnishing total tonnage and the freight charges via each junction to each station on the line of the road, and making it comparatively easy, after having inserted the miles, to arrive at the ton miles. The tons and ton miles of such abstracting as has been done by the Remington-Wahl typewriters is combined with this, and it has been found comparatively inexpensive to key punch cards from the Remington-Wahl tabulations covering this information as well as commodities and combine such tabulations with the Powers machines' tabulations.

Interline forwarded cards are sorted as from each Boston & Maine station in strictly numerical order of billing to all roads via any one junction, and after inserting the miles between that station and the junction it makes it comparatively simple to arrive at the ton miles.

Another sort of the cards is made through the sorting machines and cards are sorted out for each commodity by itself, and these cards put on the tabulator printer, a total weight of each commodity is arrived at, which combined, must agree with the total tonnage for the entire month.

The commodity tonnage, local received, interline received and interline forwarded can be kept entirely separate if necessary.

We are indebted to John F. Turner, general auditor, and to N. H. Ricker, auditor of freight receipts, for permission to study the Boston & Maine auditing system and to use the forms shown.

EXPORTS MAKE RECORD SINCE WAR WAS BEGUN.—Exports from the United States to the neutral world have doubled since the beginning of the European war, and to the belligerent world have trebled. A compilation made public recently by the National City Bank showed that exports to the neutral sections of the world other than those of Europe were, in the Government's fiscal year 1917, \$1,838,000,000 against \$877,000,000 in 1914. To neutral Europe the total for 1917 was \$414,000,000 against \$184,000,000 in 1914. This made the total exports to the entire neutral world, European and non-European, in 1917, \$2,252,000,000 compared with \$1,061,000,000 in 1914, and to belligerent Europe in 1917, \$4,042,000,000, against \$1,304,000,000 in 1914. The increase in exports to the entire neutral world 112 per cent, and to the belligerent countries of Europe 210 per cent.

Exclusive Federal Regulation Urged

U. S. Chamber of Commerce Committee Favors Federal Incorporation and Control of Securities and Rates

AS briefly noted in last week's issue, the United States Chamber of Commerce is taking a referendum vote of its membership on a report of its Railroad Committee recommending an extension of the authority of the federal government in matters of railroad regulation to avoid the present conflict between state and federal regulation. The referendum was ordered in accordance with a resolution adopted by the National Council of the chamber last November, recommending a referendum to ascertain the opinion of the business interests of the country respecting legislation designed to make certain that transportation facilities of the country may be stabilized, improved and extended to meet and keep pace with the needs of commerce and the entire public. The report of the committee is as follows:

PART I—RECOMMENDATIONS

The Railroad Committee has spent several months making a careful study of the present system of railroad regulation and reviewing the various plans for perfecting it that have been suggested by railroad executives, labor leaders, and commercial organizations in all parts of the country. The committee has also made a detailed analysis of all of the railroad bills introduced in the 63rd and 64th Congresses in order to learn what constructive plans have been proposed and what views have been expressed by the Congressional leaders on whom we must depend for any new railroad legislation. As a result of this study the committee has reached certain definite conclusions that are embodied in the four recommendations submitted in this report.

It has not been deemed necessary to include any recommendations having in view the provision of facilities for the transportation of men and materials during the present war, because the railway executives themselves are already doing very effective work along this line, thus giving positive assurance that in all cases of military necessity existing railroad facilities will be used to their maximum capacity.

The fact of overwhelming importance, however, is that as soon as the war is over the railroads will need greatly increased facilities in order to meet demands arising from the development of industries serving the home market, from the increasingly sharp commercial competition with foreign countries, and from the necessity for transporting to the seaboard enormous quantities of building materials, machinery, and other commodities needed for reconstruction in those parts of Europe that have been overrun during the war.

Undeveloped areas in our own country must be cultivated in order to supply the increasing demands for food at home and abroad. As transportation is an essential element in farm development, branch lines must be built and additional equipment provided to enable us to supply our own markets and those of our allies with the necessities of life.

The railroad question that is really of vital importance therefore is "What steps can we—the American people—take through our representatives in Congress to enable the railroads to secure the necessary capital for terminals, extensions, and equipment, and to provide such intelligent control and regulation as to insure efficient and uniform service?"

Unlike other business organizations the railroads are unable to control either their receipts or their expenditures.

Their receipts are limited by the Interstate Commerce Commission when it regulates the rates they are allowed to charge for transportation service which is the only thing they have to sell. At the same time their expenditures for labor and materials are increased by government authorities and labor organizations and by varying market conditions over which they have no control, and this is done without regard to whether the money needed to pay the increase arbitrarily imposed upon them is or is not available.

It is generally recognized that there are defects in the system of railroad regulation that have furthered the agitation in favor of government ownership. The committee believes, however, that it is entirely possible to perfect the present system of regulation under private ownership, and that if Congress will enact legislation based upon the recommendations made in this report it will go a long way toward accomplishing that purpose.

FEDERAL REGULATION OF RAILROAD SECURITIES

The issuance of railroad securities is now regulated by the states from which the railroads receive their charters. Since 1897 the legislatures of 23 states have enacted laws giving their regulatory commissions authority to regulate the issuance of railroad stocks and bonds; but these laws are so conflicting in character that they have had a disastrous effect on the financial condition of the railroads and have seriously interfered with necessary railroad development. Whatever the effect of the laws in these 23 states, there has been no attempt in the other states,—more than one-half,—to protect the public.

For reasons stated in Section I of Part II of this report the committee believes that the time has come for the federal government to assert its right to regulate security issues by placing them under the supervision of the Interstate Commerce Commission.

Therefore, the committee recommends that provision be made for federal regulation of the issuance of railroad securities.

RAILROAD INCORPORATION LAW

With few exceptions the railroads of the country are now operating under charters granted, not by the federal government, but by the individual states through which they run. For example, one trunk line running from Chicago to the Pacific Coast passes through seven different states and is obliged to operate under seven separate jurisdictions. The regulatory laws of each of these states define certain conditions that must be fulfilled by the carrier and impose certain obligations that may at any time be modified or extended by the state.

A study of the conflicting regulations adopted by the several states and of the confusion resulting from their enforcement has convinced the Railroad Committee that for reasons given in Section II of Part II of this report there is immediate need for the federal government to formulate a national transportation policy and to make possible the federal incorporation of interstate carriers.

The committee, therefore, recommends that Congress pass a general railroad incorporation law under which all railroad carriers subject to the jurisdiction of the Interstate Commerce Commission may organize.

FEDERAL INCORPORATION OF RAILROADS

There has been a great deal of discussion by shippers, carriers and government officials in regard to whether the

railroads should merely be given an opportunity to incorporate under federal authority or should be required to do so. Many constituent members of the Chamber of Commerce of the United States have made a careful study of this question and in resolutions forwarded to the chamber have declared themselves unmistakably in favor of compulsory federal incorporation. For reasons given in Section III of Part II of this report the Railroad Committee has reached a similar conclusion.

The committee, therefore, recommends that if Congress passes a railroad incorporation law, all railroad carriers subject to the jurisdiction of the Interstate Commerce Commission, both those now existing and those hereafter to be created, be required to organize under this law.

FEDERAL REGULATION OF RAILROAD RATES

The decisions of the United States Supreme Court in the Minnesota rate case, and in the Shreveport case, have established the authority of Congress to regulate intrastate rates whenever those rates throw an undue burden on interstate commerce. These cases recognize that when Congress passed the acts to regulate Commerce it did not exercise its full power of regulation; and that under these acts the Interstate Commerce Commission can regulate intrastate rates only to the extent of prohibiting discriminations found to exist between intrastate and interstate rates. For reasons given in Section IV of Part II of this report the committee believes that the control of the Interstate Commerce Commission should be extended and should be made complete over such intrastate rates when they affect interstate commerce.

Therefore, in view of the fact that conflict has arisen with respect to the jurisdiction of the Interstate Commerce Commission over intrastate rates, even though such rates affect interstate commerce, the committee recommends that the commission be given authority by statute to regulate intrastate rates when these rates affect interstate commerce.

PART II—SECTION I—FEDERAL REGULATION OF RAILROAD SECURITIES

Government regulation of railroad securities is necessary:

(a) *In the public interest.* Effective government regulation of railroad securities is necessary in the public interest. The fixed charges and other capital expenses of the carriers are in proportion to the volume of securities issued. The revenues to meet those expenses are necessarily derived from shippers and passengers. Those who make use of the railroads thus have a direct interest in the volume and character of the securities issued by carriers.

(b) *To protect investors.* As investors a large share of the public is affected by the amount and character of railroad securities issued. One railroad corporation has nearly 100,000 stockholders of whom about one-half are women; other corporations number their stockholders by the tens of thousands; while individual bond holders and persons who are indirectly so through insurance companies, trust companies and other fiduciary institutions holding these securities, total many millions.

(c) *To assure the provision of adequate transportation facilities.* The railroad companies also have need for government regulation of their securities. Without government regulation it is possible for a limited number of railway companies by speculative and irresponsible financing to bring all railroad securities under suspicion and thus to make it difficult for railroad companies generally to secure the funds needed to provide the public with adequate transportation facilities.

Federal regulation of railroad securities should be substituted for state regulation because:

(a) *Less than half of the states now regulate the issue*

of railroad securities. The present regulation is incomplete both because of the absence of regulation in a majority of the states and also because all of the important railroad systems in the United States have lines in several states. A large railroad company may have only a short mileage or even no mileage at all in the state from which the company's charter was derived. Under such conditions the corporation may escape regulation by the states that have the greatest interest in the financial operations and the service performances of the carriers. The railroad history of the last few years proves conclusively that state regulation does not prevent railway financing that is ruinous alike to the carriers and to the public.

(b) *The laws of the states vary greatly.* There are numerous instances of conflict between the laws of one state and those of another. This limits the effectiveness of the regulation of railroad securities while making the regulation unnecessarily expensive to the carriers. Government regulation of securities should be uniform throughout the country; it should be adequate for the accomplishment of the ends desired and should aim to be constructive and helpful to both the carriers and the public.

(c) *The federal government alone can make regulation uniform and effective.* The federal government acting through the Interstate Commerce Commission can make the regulation of railroad securities more effective than the several states can make it, however wisely they may act. The federal government can require regular and special reports of all railroad companies in the United States, it can obtain full information concerning the financial methods and operations of the carriers and concerning the capital needs of the corporation whose securities are subject to regulation. The federal government can also maintain adequate supervision over the financial operations of the carriers. It can enforce throughout the United States the requirements of the federal statutes and thus insure the observance by the carriers of the requirements contained in certificates authorizing the issuance and sale of securities.

Inasmuch as it is the United States government rather than the several states that can make uniform and adequate the regulation of railroad security issues and can maintain the supervision over the financial methods of the carriers that is needed to secure fully the aims of government regulation of railroad finances, legislation should be enacted substituting federal for state control and supervision of the financial operation of railroad companies.

Legislation for the federal regulation of railroad securities:

(a) Should define carefully the conditions to be complied with by the companies proposing to issue securities.

(b) Should give the Interstate Commerce Commission ample authority to obtain by investigation, and through regular and special reports of railroad companies, full information concerning the financial methods and operations of the carriers and the capital needs of the corporations whose securities are subject to regulation.

(c) Should enable the Interstate Commerce Commission to approve applications of carriers for authority to issue securities provided the Commission, after necessary investigation, finds that the petitioning carrier has fulfilled the requirements of the statute; and should also enable the Commission, if the provisions of the statute have not been fully observed, to require the carrier to make the necessary changes in its plans for the issuance of securities and to make appropriate amendments to its petition. The Commission should be authorized to approve a proposed issue of securities only when the financial plans and the petition of the carrier meet the requirements of the statute.

(d) Should require the Interstate Commerce Commission to maintain by means of an adequate force of inspectors such supervision over the financial operations of the

carriers as will enable the Commission to enforce the provisions of the statute and to insure the observance by the carriers of the requirements contained in the certificates authorizing the issuance and sale of the securities.

In November, 1916, the committee on capitalization and intercorporate relations of the National Association of Railway Commissioners reported as follows:

We reiterate the expression on this subject heretofore promulgated by your Association, and we unhesitatingly and emphatically declare our belief that the capitalization of the interstate carriers and the interstate public utilities should be subject to federal authority. To state the proposition is at once to answer it. It is not necessary to review the many cases so well known to the members of this Association, wherein several states have attempted to exercise jurisdiction over the identical issue of stocks and bonds by interstate carriers.

This report of the committee, to be sure, has not been formally approved by the association of railroad commissioners, having gone over for consideration until their next annual meeting. Nevertheless, the committee not only goes on record in favor of this proposition, but it calls attention to the fact that in 1913 the association approved the recommendation for the regulation of the stocks and bonds of interstate common carriers by the Interstate Commerce Commission; and that in 1915 a resolution in favor of vesting in the Interstate Commerce Commission control over the securities of railroads constructed across state lines was passed by the Association.

The report also calls attention to the fact that the Interstate Commerce Commission "have constantly urged with emphasis and detailed argument federal control of interstate capitalization." It is true that the report made some years ago by the commission of which President Hadley of Yale was chairman, did not favor vesting in the Interstate Commerce Commission control of the issuance of stocks and bonds by interstate carriers, but it is believed that subsequent developments (particularly the increased regulation of such stocks and bonds that has been vested by the legislatures of the different states in their state commissions) have altered the situation to such an extent that the conclusions of the Hadley commission are now inapplicable; and it is possible that if the question were again presented to that commission it would, in view of these subsequent developments, reach a conclusion in favor of federal control of such securities.

It is believed that the best results can be accomplished without disturbing the present outstanding obligations of the carriers. It seems quite possible under the decisions of the Supreme Court to reincorporate the existing corporations under a federal incorporation law without disturbing the outstanding securities. The reorganization would merely substitute a federal corporation in lieu of the existing state corporation. Such procedure would avoid serious legal questions as to the power of Congress to affect outstanding securities and the existing contracts. Under the decisions of the Supreme Court it is believed that the holders of the present securities would be held to have taken these securities subject to the paramount power of Congress over interstate commerce, and that therefore Congress could, in spite of these existing contracts, force the reincorporation of the railroads under a federal statute. But whether Congress could go further and provide, for instance, for the cutting down of outstanding securities to the present actual value of the properties they represent might be doubtful in law and would at any rate be questionable as a matter of practical procedure in view of the widespread opposition which would be felt to any move in that direction.

SECTION II—RAILROAD INCORPORATION LAW

Many of the leading commercial organizations in the country have declared in favor of federal incorporation of railroads. For example, the Philadelphia Board of Trade has submitted to the Chamber of Commerce of the United

States a program of remedial legislation in respect to government regulation of railroads which includes:

Legislation to provide for the grant of federal charters to all railroads engaged in interstate commerce without impairment on the one hand of the rights of the several states with regard to the fair proportionate taxation of railroad property within their borders and without surrender on the other hand of the rights granted to the roads by state charters except to the extent that such rights may be inconsistent with federal control; this legislation to be drafted with the end in view of placing all phases of railroad regulation in the exclusive control of the federal government.

The National Industrial Traffic League says in a report adopted November 10, 1916:

It appears to the majority of those present that federal incorporation of common carriers is desirable, provided that in bringing this about the government incur no moral and financial obligation in respect thereto.

The Railway Business Association says in a report on Congress and the railroads:

Incorporation and regulation of security issues should be federal.

The Illinois Manufacturers Association says in a report on railroad regulation:

The association approves the federal incorporation of common carriers and the federal regulation of the issue of securities of such carriers but only after providing proper safe-guards against increase and inflation of capitalization.

The Merchants Association of New York declared in a resolution passed in November, 1916:

That the public interest requires that all the railroads of the country shall effectively regulate their affairs by the sole authority of the federal government of the conditions under which railroad securities may be issued; and that as a means to that end federal incorporation of railroads should be provided for.

The Freight Traffic Committee of the Chicago Association of Commerce says in a report submitted in January, 1917, and afterwards adopted as the judgment of the Association of Commerce as a whole:

It seems to the Committee that the regulation of the issuance of securities and the expenditure of the money raised by the sale thereof should be placed by Congress in the exclusive control of the federal government; and that federal incorporation would be a proper means to the accomplishment of that end.

That Congress has power to enact a general railroad incorporation law must be conceded under the Pacific Railroad cases, 115 U. S. 1; The North River Bridge case, 153 U. S. 525, and the Metropolitan National Bank Case, 141 U. S. 520. The language of the recommendation is carefully selected to cover not only creation of railroad corporations but the nationalizing of corporations already existing under state charters. Indeed, the latter function is most important, since the need of new companies is not pressing.

The propriety of new legislation must rest on the existence of evils demanding remedy. The presence of evils in connection with the regulation of interstate commerce involved in railroad transportation is apparent to the most casual observer. A partial list of these evils includes conflict of jurisdiction between state and federal control resulting in confusion, inconsistency, useless expense, waste of energy and reduced efficiency of physical means at hand; apprehension of investors, frightened capital, and injured credit, resulting in reduced ability to augment physical equipment necessary to keep abreast of the expanding volume of business. From these basic evils there springs a host of lesser difficulties which will readily occur to the thoughtful mind.

In the process of delegating to the national government certain attributes of the sovereign states they divested themselves completely of certain powers, among which was the power to regulate interstate and foreign commerce. As to this power the relation of the two governmental jurisdictions was reversed, in that the states could exercise it only to the extent Congress chose to redelegate it, either directly or by implication from its own failure to exercise it. The present evils find their root in the failure, up to the present time, to crystallize this reversal of relation between the two governments into comprehensive legislation in respect

of interstate railroad transportation. The corporate creatures through which, almost exclusively, this transportation is conducted have with few exceptions derived their being from the states, and, in consequence, have owed allegiance to their creators in respect of all their activities except interstate commerce. The jurisdiction of the federal government is thereby limited to certain activities of these corporations while their general corporate existence is dominated by the states which created them.

This situation exactly reverses the relations between the two governments with respect to the greatest instrumentality of interstate commerce, viz., railroad transportation. Instead of the national government creating the fundamental instrumentalities of interstate commerce over which it has exclusive control, and delegating authority over such of the local activities as could be best exercised by the states, the states have hitherto created them, notwithstanding exclusive authority over their interstate operations has been delegated to the general government through the commerce clause of the federal constitution. As a consequence, under modern conditions the great bulk (at least four-fifths) of their activities is dominated by a power different from that which imparted life to them and holds dominion over the conditions of their continued existence. Needing additional capital to supply increased facilities, they must obtain it under conditions imposed by a jurisdiction directly interested in only a small portion of the service to be improved thereby. While the local demand for equipment is but a small fraction of the whole, the rule of its distribution is made exclusively by the local authorities.

The foregoing recommendation seeks to correct the fundamental conditions producing these evils by transferring the allegiance of carriers engaged in interstate commerce to the jurisdiction of that realm in which the great and ever increasing proportion of their activities is carried on. That such a change of legal status would be beneficial seems obvious because (a) through this means adequate and consistent regulation of the issuance of securities necessary to provide the capital demanded for the increased efficiency of these carriers can be best provided; (b) in this way alone can the inevitable conflict between the fixation of intrastate rates by the local commissions and interstate rates by the Interstate Commerce Commission be peacefully and intelligently reconciled; (c) thus alone can the multiplicity of masters be practically eliminated.

The railway executives represented by Mr. Alfred P. Thom are on record before the Newlands Committee as favoring such regulation. It was urged by Mr. Thom that while, according to his view, it would be permissible for Congress to regulate the issuance of securities by interstate carriers even without federal incorporation, such a procedure would involve nice legal questions which might result disastrously to the railroads and the public, and that in order to avoid those difficulties he is emphatically in favor of federal incorporation of interstate carriers, there being under those circumstances no question as to the power of Congress to control the issuance of their securities.

The recommendation does not contemplate any interference with the power of the states to tax the physical property of the carriers at the same *ad valorem* rates as apply to all taxable property in the respective states. Neither does it contemplate that Congress would withdraw from the states power to make reasonable police regulations. While some of the powers of the various state railroad commissions would necessarily be transferred to the Interstate Commerce Commission, the state commissions would still retain responsibility for the regulation of thousands of local public utilities, and their real usefulness would be undiminished by the elimination of evils flowing at present from joint control of the operations and credit of interstate carriers by both state and federal governments.

Legislation involving the principles of this recommendation would lay the foundation of a new structure for the rehabilitation of railroad credit and thus relieve a situation that is characterized by impractical control, impaired usefulness, and inadequate regulation of railroad securities.

SECTION III—FEDERAL INCORPORATION OF RAILROADS

If it be desirable to authorize the incorporation and nationalization of all interstate carriers under general laws of Congress it would seem to follow as a necessary corollary that compliance with such laws should be made compulsory rather than permissive. This is true for the reason that one of the fundamental objects to be obtained is uniformity throughout the entire railroad system of the United States, and this cannot be obtained if any substantial lines are permitted to retain their allegiance to state authorities.

In order to make a railroad incorporation law effective it would be necessary to require all interstate carriers to organize under the law. It is quite probable that some of the important lines in the United States would not of their own volition change their allegiance from the state to the national authorities because of certain special privileges claimed under their state charters. It would be a matter for Congress to consider, if the law so recommended compels their nationalization, whether or not these special privileges would be in whole or in part continued. Whether this is done or not the paramount interests of the public which would be subserved by complete uniformity would outweigh any special privilege now enjoyed by any particular line under the provisions of its state charter.

SECTION IV—FEDERAL REGULATION OF RAILROAD RATES

Intrastate rates are closely interwoven with interstate rates and that any regulation of the one must have some effect upon the other seems clear. Most of the railroads of the country cross state lines and handle both intrastate and interstate commerce over the same rails, by the same employees, and often in the same cars. The same commodities are handled in both intrastate and interstate commerce. Mr. Justice Hughes in the Minnesota rate case said:

The interblending of operations in the conduct of interstate and local business by interstate carriers is strongly pressed upon our attention. It is urged that the same right of way, terminals, rails, bridges and stations are provided for both classes of traffic; that the proportion of each sort of business varies from year to year and indeed from day to day; that no division of the plant, no apportionment of it between interstate and local traffic can be made, today which will hold tomorrow; that terminals, facilities, and connections in one state aid the carrier's entire business and are an element of value with respect to the whole property and the business in other states; that securities are issued against the entire line of the carrier and cannot be divided by states; that tariffs should be made with a view to all traffic of the road and should be fair as between through and short-haul business; and that, in substance, no regulation of rates can be just which does not take into consideration the whole field of the carriers' operations, irrespective of state lines.

It is to be observed that Mr. Justice Hughes does not in any way controvert the correctness of these contentions, but he goes on to say:

The force of these contentions is emphasized in these cases and in others of like nature by the extreme difficulty and intricacy of the calculations which must be made in the effort to establish a segregation of intrastate business for the purpose of determining the return to which the carrier is properly entitled therefrom * * *. But these considerations are for the practical judgment of Congress in determining the extent of the regulation necessary under existing conditions of transportation to conserve and promote the interests of interstate commerce. If the situation has become such by reason of the interblending of interstate and intrastate operations of interstate carriers and that adequate regulation of their interstate rates cannot be maintained without imposing requirements with respect to their intrastate rates which substantially affect the former, it is for Congress to determine within the limits of its constitutional authority over interstate commerce and its instruments, the measure of the regulation it should supply.

In both the Minnesota rate case and the Shreveport case the Supreme Court pointed out that Congress had not exercised the full jurisdiction vested in it by the Constitution over railroad rates, and that it was for Congress to determine how far federal regulation of any intrastate rates affecting interstate rates should go. The court did in the

Shreveport case, to be sure, hold that under the existing laws the Interstate Commerce Commission could by its orders indirectly affect intrastate rates when the Commission affirmatively found that actual discrimination resulted between existing intrastate and interstate rates. But under both of the above decisions the court emphasized the fact that Congress could lawfully exercise greater authority over intrastate rates than it had thus far vested in the Interstate Commerce Commission.

The committee believes that it is desirable that the regulation of all rates which affect interstate commerce, and so affect the people of more than one state, should be regulated by the Interstate Commerce Commission, the representative of the people of all the states. That only by vesting such power in the Interstate Commerce Commission can uniformity of regulation be brought about and all unfair discriminations abolished; that it is eminently unjust that intrastate rates should be regulated and controlled by state authority in such a manner as to give points within that state a preference over other competitive points situated in adjoining states; that this condition has already arisen on numerous occasions and is sure to arise again unless the Interstate Commerce Commission is given more complete jurisdiction over such discriminatory intrastate rates.

So long as there are two distinct regulatory bodies, the one the Interstate Commerce Commission and the other a state commission, exercising jurisdiction and control over rates for the transportation of the same commodities over the same rails and often in the same cars, the jurisdiction of the Interstate Commerce Commission depending on whether or not the transportation is interstate or affects interstate commerce, there is sure to be more or less conflict between these two regulatory bodies. The committee believes that such conflict should be reduced to a minimum and that it is to the interest both of the shippers and the carriers that in all matters affecting interstate commerce the supreme power of the federal authorities should be recognized and enforced. The committee therefore have made the above recommendation in favor of further legislation vesting in the Interstate Commerce Commission full jurisdiction over intrastate rates when they affect interstate commerce.

Undoubtedly a finding of fact by the Interstate Commerce Commission that a particular intrastate rate affects interstate commerce would be subject to review in the courts if the commission acted in a purely arbitrary manner and found that there was such a relation between the intrastate and interstate rates when there was no basis whatever for such conclusion; but if it was a matter upon which there could be an honest difference of opinion and there was some evidence in the record sustaining the conclusion of the commission, we believe that the finding of the commission in this as in other particulars would be treated as practically conclusive by the courts.

The members of the Railroad Committee are as follows: Harry A. Wheeler, chairman, banker, of Chicago; George W. Anderson, lawyer, of Boston, federal district attorney; F. C. Dillard, lawyer, of Sherman, Tex., formerly vice-president and general counsel of the Chicago, Rock Island & Pacific; R. H. Downman, of New Orleans, president of the National Lumber Manufacturers' Association; Dr. Thomas F. Gailor, chancellor and president of the board of trustees, University of the South; Stephen A. Foster, lawyer, of Chicago; Emory R. Johnson, professor of transportation and commerce, University of Pennsylvania; E. T. Meredith, editor and publisher of *Successful Farming*, Des Moines; George A. Post, president, Railway Business Association, New York City; William Z. Ripley, professor of political economy, Harvard University; G. W. Simmons, vice-president Simmons Hardware Company, St. Louis, Mo.; Alexander W. Smith, lawyer, of Atlanta, Ga.; and Charles R. Van Hise, president of the University of Wisconsin. Mr.

Anderson was unable to participate in the work of the committee and did not sign the report.

ARGUMENTS AGAINST THE COMMITTEE'S REPORT

To the report as submitted to the membership there is appended the following statement of arguments against the recommendations of the committee:

(a) The report recommends governmental control of securities, to be exercised by federal authority. Against these recommendations it may be argued that other methods for preventing abuses are possible and perhaps more desirable.

Legislation to prevent abuses in issue of securities can take the form of provision for greater responsibility on the part of the individual directors who participate, or who by virtue of their office should participate, in authorizing issues and on the part of the bankers who sell them to the public. Increase in responsibility in this way would not only prevent abuses but would in many cases lead to increased attention on the part of directors to the management of their corporations, which in the past has sometimes been left in large measure to an individual or a group of individuals, contrary to the principles which should govern use of the corporate form in business. In other words, it can be argued that legislation should take such form as to lead to increased efficiency in the direction of railways.

Governmental control of securities will have an opposite influence. The more authority the government—state or federal—exercises over such matters the less the responsibility to holders of securities that will lie with the men in charge of a corporation's affairs, and the less the incentive they will have to give the personal attention and effort that will make it a directly successful enterprise.

Moreover, a statute prescribing control of capitalization does not always afford protection against abuses; some of the state statutes regarding securities have not been vigorously enforced.

Government control, it may be argued, is also undesirable because it will directly or indirectly impose an obligation upon the government to adjust rates to the requirements for interest and dividends and in effect to guarantee that its regulation of rates will be of such a character as to insure returns upon the securities which are approved. Thus, a new element would be introduced into the question of rates, which is already very difficult. For the protection of the property actually invested this is not necessary, as regulation of rates cannot now be carried to a point where a fair return upon the property devoted to the public service is prevented. In order that the extent of this property may be determined Congress several years ago directed that it should be valued by the Interstate Commerce Commission, and much money and time have already been devoted to the task. If the element of providing for interest and dividends is introduced into consideration of rates, the present limitation upon the principle that a fair return upon property is to be allowed may be impaired; this limitation is that in any event the rates must be reasonable to the public.

In connection with the recommendation that regulation of securities should be undertaken by the federal government it may be argued that diversity in state legislation is not in itself an argument for federal action. This diversity exists with respect to legislation affecting many subjects other than railway securities. Regarding a number of subjects related to commerce—such as the law governing promissory notes, the law concerning the sale of personal property, and the law affecting warehouse receipts—uniformity has very largely been secured through the preparation of carefully drawn codes which could be authoritatively recommended to the states.

(b) The report indicates that approval should precede issue of securities. Against this recommendation it can be argued that such a procedure will not leave railways in a

position to take advantage of favorable situations in the market for money.

Changes in the money market are often rather sudden. If a corporation seeking new funds is to obtain them at low cost, it must act quickly in making its arrangements and take advantage of favorable opportunities. It cannot act quickly, however, if the securities to be sold have to receive approval in advance, since such approval can be given only after thorough investigation. Such an investigation by a government authority will require delay. The result may be that the cost of funds will be materially increased.

(c) Against the recommendation of the report that outstanding securities should remain as they are it might be urged that such a plan might contain an element of unfairness to the public.

Outstanding bonds will run for varying periods; some will not mature until the last decade of this century, and a few run to dates subsequent to the year 2000. These distant maturities indicate the dates to which any complete readjustment of securities to property values might be delayed.

Whatever the maturity, provision would eventually have to be made to retire these bonds. In order to make provision for retirement, and for interest in the interval, there would be, under a plan of governmental regulation of new issues, a degree of pressure upon the regulating authority to cause rates charged for service to yield the necessary funds. So far as this influence was operative, and caused rates which by present standards would be unreasonable to the public, the result would be detrimental. Receiverships growing out of past errors in management might be avoided, but at the cost of the public.

Likewise, if outstanding stock should remain in all cases, similar inequity might result, since the plan might fairly be said to tend to cause enhancement of such stocks. Stock by its nature has no date of maturity, except insofar as the life of the corporation is limited by statute, and outstanding stocks might consequently become a part of the capital upon which the regulating authority would have to seek to cause a return.

Under these circumstances, there might be a question which would be the more equitable and desirable course—an attempt to arrange for conversion of existing stocks and bonds into new securities issued upon a basis of present actual property values or a decision, because of the difficulties in the way of such a conversion, to continue the present capitalization of all railways under conditions which may cause rates to bear special charges in cases of erroneous capitalization.

(d) With respect to the recommendation of the report that there should be a general federal statute under which railways may incorporate it may be argued that, on the contrary, railways should continue as state corporations.

The proposal of the report would place railways in a situation different from the position of other corporations that engage in interstate commerce and different from the status of individuals. Except in so far as Congress might otherwise direct, they would not be subject to suit in state courts nor would they be subject to the taxing power of the states. In other words, they would largely cease to have dual relations, to state and federal authority, and become subject only to federal authority.

Such a result would in many ways be a reversal of the present situation. An individual is subject to the laws of the state in matters as to which states have jurisdiction under the Constitution, and to the laws of the United States as to subjects regarding which the Constitution confers power on the federal government. At present a corporation organized under the laws of a state is likewise under dual control, but the fact that it is organized under state law does not impair the extent in which it is subject to federal laws in those regards which under the Constitution belong to the United

States. In other words, it can be argued that a state railway corporation is subject to complete federal regulation with respect to its participation in interstate commerce, and that the degree of this possible regulation cannot be increased by federal incorporation.

Federal incorporation might, on the other hand, lead to impairment of the exercise of rights which belong to the states. Even though Congress made federal corporations subject to suit in state courts, and to local taxation as to tangible property, one Congress cannot bind another and, consequently, a succeeding Congress might alter the policy. In any event, state taxes on intangible property values which have been laid in many states, whether rightly or wrongly, might be made impossible.

The argument of the report that a railway line which operates in two or more states should be incorporated under federal law, and at least in some ways withdrawn from local control, may not recognize the differences in conditions, and the differences in local public opinion regarding policies, that are inevitable in so large a country as the United States. These differences are recognized in the combination of state and federal government which we have. It may be consistent with the fundamental principles which have generally left local questions to state authority that a railway operating in Oregon and Idaho should be subject to different taxes, and to different regulations as to protection of the public from physical injury, from the taxes and the regulations which are made applicable to a railway operating in Pennsylvania and Ohio, or in Georgia and Alabama. A circumstance that the roads might happen to belong to the same owner should have no bearing.

(e) Compulsory incorporation under a federal law, which is recommended by the report, might retard new construction.

Most of the railway systems of the country originated as small lines, undertaken in the first instance by local promoters, and to a degree new construction is still a matter of local initiative. When a small line is contemplated by local interests, the organizers of the enterprise may prefer to incorporate under state law; according to the recommendation of the report, however, they would have to obtain a federal charter as soon as their line began operation, since it would almost inevitably carry interstate shipments. Even if new construction tends to be undertaken more and more exclusively by railway systems, rather than by local enterprise, it may be unwise to take any action that will discourage the latter.

As to existing roads compulsory incorporation also raises legal questions. Since the present state corporations have special privilege in some instances, it is possible that they cannot be deprived of these privileges as a matter of regulation, unless the privileges are abuses which Congress can prohibit under its regulatory power. Stockholders and bondholders of state corporations might be upheld by the courts if they refused to exchange the obligations they held for obligations of new corporations.

Compulsory federal incorporation has not been used in other fields. For example, the national banking law did not compel state banks to convert into national banks.

WOOD FOR FUEL IN ARGENTINA.—The use of wood fuel to replace coal is assuming important proportions and is contributing a good share to the railway traffic of the Province of Santa Fe. It is reported that one railway transported 150,000 tons of wood in June, and that larger shipments are in prospect, inasmuch that the Santa Fe Railway has been compelled to warn shippers not to contract for larger quantities than the facilities of the railway can accommodate. It is reported from the Province of Santiago del Estero that many thousand tons of hardwood fuel are awaiting cars for transportation southward.

W. W. ATTERBURY APPOINTED DIRECTOR GENERAL OF TRANSPORTATION

Official announcement has been made that W. W. Atterbury, who was recently given a leave of absence as vice-president of the Pennsylvania Railroad, has been appointed director general of transportation of the United States expeditionary force now in France, a position corresponding to that of S. M. Felton as director general of railways in this country. The two officers will co-operate in securing railway and transportation equipment of all kinds and also the special units of railway men necessary for the transportation work in France. Mr. Atterbury is now in France in active charge of broad and narrow gage railways, docks and highways, in the immediate zone of operations.

Mr. Atterbury was born on January 31, 1866, at New Albany, Ind., and graduated from Yale University. He entered railway service in 1886 as an apprentice in the Altoona shops of the Pennsylvania Railroad. From 1889 to 1892 he was assistant road foreman of engines on various divisions and the Philadelphia, Wilmington & Baltimore; from 1892 to 1893 he was assistant engineer of motive power on the northwest system of the Pennsylvania Lines, and from 1893 to 1896 master mechanic at Fort Wayne, Ind. On October 26, 1896, he was appointed superintendent of motive power of the Pennsylvania Railroad at Altoona, and from 1901 to 1903 was general superintendent of motive power with the lines east of Pittsburgh and Erie. On January 1, 1903, Mr. Atterbury was appointed general manager, which position he held until March 24, 1909, when he was elected fifth vice-president.

He was later made fourth vice-president and on May 8, 1912, vice-president in charge of operation. Mr. Atterbury is president of the American Railway Association.



W. W. Atterbury

STOKER OPERATION ON THE BALTIMORE & OHIO*

By W. L. Robinson

Supervisor Fuel Consumption, Baltimore & Ohio

Locomotive stokers made their appearance on the Baltimore & Ohio in the latter half of 1912 and have been gradually added until there are now 373 locomotives stoker-fired. The installations under way will bring the total number of stoker locomotives up to 429. By the use of these stokers the manual labor of firemen in placing coal in the firebox has been very greatly reduced. They have eliminated the discussion as to the necessity of two firemen on locomotives, and it has not been necessary to have the coal shoveled forward on the engine tender at intermediate points. The

stoker has made it possible to increase the load hauled by a locomotive from 8 to 15 per cent. The principal advantage derived from the use of the locomotive stoker is that it has made it possible to use the full boiler capacity over extended periods and at points where the maximum tractive effort of the locomotive is required.

On the Baltimore & Ohio the stoker engines handle 58 per cent of the freight gross ton mileage of the system and consume 58.2 per cent of the total freight fuel, or 31 per cent of the total locomotive fuel. The installation of crushing plants at some fuel stations has been provided for, and these plants will be used for properly preparing the coal for these engines, thus permitting more economical use of the fuel.

Road tests have shown that the mechanical firing of the smaller sizes of coal is not as economical as manual firing of run-of-mine coal. This has been confirmed by recent laboratory tests at the University of Illinois, these tests showing

that the mechanical firing of 1¼-in. screenings is 15 to 18 per cent less efficient than when firing run-of-mine coal by hand, and that when 2-in. screenings are used on a stoker engine, there is a loss in efficiency of from 7 to 13 per cent as compared to hand firing with run-of-mine coal.

When hand firing run-of-mine coal at a rate of combustion slightly below the average (50 lb. per square foot of grate surface per hour) it has been found that the loss due to stack cinders was 3½ per cent, whereas with the 1¼-in. screenings from the same mine, used on a stoker-fired engine, the loss was 12 per cent. At the rate of combustion at which locomotives are operated a considerable portion of the time (110 lb. of coal per square foot of grate surface per hour) the losses were 9 and 16.1 per cent respectively.

To obtain maximum economy with stoker-fired engines, it is essential that

the coal be high in volatile matter, that it be as large as can be handled by the stoker (2½-in. screenings), that the exhaust nozzle be as large as the conditions will permit, that the brick arch be maintained in accordance with existing standards, and that the distributors and stoker apparatus be maintained and handled in accordance with instructions. If these items are followed carefully, the spark loss will be reduced materially and the capacity of the locomotive will be increased.

During the past fiscal year the fuel consumed on the Baltimore & Ohio was under 6,000,000 tons. Comparing the fiscal year of 1916 with the year before, systematic efforts were made to conserve fuel, there was 0.1 per cent less fuel used, 33.3 per cent more net tons hauled one mile, and 26.7 per cent greater revenue. For the first nine months of the 1916-17 fiscal year only 3.48 per cent more fuel was used, as compared with a similar period for the previous fiscal year, with an increase of 36.6 per cent in net tons hauled one mile and with an increase of 35 per cent in revenue.

*Presented at the Deer Park meeting of the Baltimore & Ohio officers.

INCREASE IN OPERATING EFFICIENCY IN JUNE

With an increase of only 10 per cent in train miles, the railroads of the United States in the month of June handled 23.2 per cent more revenue ton miles of freight than in June, 1916, according to the monthly report of freight operations compiled by the Bureau of Railway Economics for the Railroads' War Board. The returns included in the statement represent about 85 per cent of the total operated mileage of roads of Class 1 and about 88 per cent of their total traffic.

The revenue ton miles for the month amounted to 32,504,988,201, as compared with 26,379,460,986 in June, 1916. Freight locomotive miles increased 10.5 per cent, loaded freight car miles increased 10.7 per cent, while empty freight car miles increased only 8.7 per cent. This increased service was performed with an increase of only 1.8 per cent in the

in the efficiency of freight operation, which has also been shown in the reports for the months of May and April, are given in the table.

RAILWAYS IN CHINA.—An order has recently been placed with American mills, says The London and China Telegraph, for rails and fittings for the 20-mile extension of the Sunning Railway, which has been in contemplation for some time. The Sunning Railway is that constructed by Chinese-American capital, under the presidency and control of Mr. Chin Gee Hee. The company has constructed about 80 miles of road connecting Kongmun, a city on tidewater, with Sunning city, and on to the vicinity of Canton. The extension of 20 miles planned is to the west of Sunning city to Pak Sha, and eventually is to extend south to the seaboard at Yeung Kong. It is further planned to extend the road westward

MONTHLY REPORT OF FREIGHT OPERATION OF STEAM RAILWAYS IN THE UNITED STATES FOR THE MONTH OF JUNE, 1917, COMPARED WITH JUNE, 1916

Item	UNITED STATES				EASTERN DISTRICT			
			Increase or decrease				Increase or decrease	
	1917	1916	Amount	Per cent	1917	1916	Amount	Per cent
Freight train-miles	49,337,461	44,859,379	4,478,082	10.0	21,513,679	20,411,265	1,102,414	5.4
Loaded freight car-miles	1,264,231,358	1,141,698,059	122,533,299	10.7	587,100,279	550,875,683	36,224,596	6.6
Empty freight car-miles	577,733,929	530,997,132	46,736,797	8.7	279,560,433	274,428,592	5,131,841	1.9
Total freight car-miles—loaded and empty	1,841,565,287	1,672,695,191	168,870,096	10.1	866,660,713	825,304,275	41,356,439	5.0
Freight locomotive-miles	58,262,226	52,721,249	5,540,977	10.5	28,703,624	27,011,894	1,691,730	6.3
Revenue ton-miles	32,504,988,201	26,379,460,986	6,125,527,215	23.2	16,671,139,151	13,973,626,824	2,697,512,327	19.3
Non-revenue ton-miles	2,777,074,734	2,407,554,357	369,520,377	15.3	853,918,604	784,682,411	69,236,193	8.8
Average number of freight locomotives in service	27,488	26,997	491	1.8	12,568	12,378	190	1.5
Average number of freight locomotives in shop or awaiting shop	3,785	4,215	d 430	d 10.2	1,779	1,919	d 140	d 7.3
Average number of freight cars in service	2,107,867	2,043,365	64,502	3.2	1,165,589	1,133,483	32,106	2.8
Average number of freight cars in shop or awaiting shop	121,521	130,440	d 8,919	d 6.8	70,061	73,312	d 3,251	d 4.4
Home	92,097	105,562	d 13,465	d 12.8	52,429	57,914	d 5,485	d 9.5
Foreign	28,534	24,139	d 4,395	18.2	17,632	15,398	2,234	14.5
Tons per train	715	642	73	11.4	815	723	92	12.7
Tons per loaded car	27.9	25.2	2.7	10.7	29.9	26.8	3.1	11.6
Average miles per locomotive per day	70.7	65.1	5.6	8.6	76.1	72.7	3.4	4.7
Average miles per car per day	29.1	27.3	1.8	6.6	24.8	24.3	0.5	2.1
Per cent of empty car-miles	31.4	31.7	d 0.3	d 1.0	32.3	33.3	d 1.0	d 3.0
Per cent of freight locomotives in shop or awaiting shop	13.8	15.6	d 1.8	d 11.5	14.2	15.5	d 1.3	d 8.4
Per cent of freight cars in shop or awaiting shop	5.8	6.4	d 0.6	d 9.4	6.0	6.5	d 0.5	d 7.7
Average miles operated—single track	196,131.33	195,998.18	133.15	0.1	52,811.50	52,881.76	d 70.26	d 0.1
Item	SOUTHERN DISTRICT				WESTERN DISTRICT			
			Increase or decrease				Increase or decrease	
	1917	1916	Amount	Per cent	1917	1916	Amount	Per cent
Freight train-miles	7,763,686	7,106,767	656,919	9.2	20,060,096	17,341,347	2,718,749	15.7
Loaded freight car-miles	196,706,511	176,846,422	19,860,089	7.8	486,424,568	413,975,954	72,448,614	17.5
Empty freight car-miles	92,756,044	83,051,613	9,704,431	11.7	205,007,450	175,516,927	31,490,523	18.1
Total freight car-miles—loaded and empty	289,472,555	259,898,035	29,574,520	9.1	691,432,018	589,492,881	103,939,137	17.7
Freight locomotive-miles	8,532,188	7,739,571	792,617	10.2	21,026,414	17,969,784	3,056,630	17.0
Revenue ton-miles	4,958,903,529	4,216,764,152	742,139,377	17.6	10,874,945,521	8,189,070,010	2,685,875,511	32.8
Non-revenue ton-miles	469,262,667	403,613,198	65,649,469	16.3	1,453,893,483	1,219,258,948	234,634,535	19.2
Average number of freight locomotives in service	4,546	4,468	78	1.7	10,374	10,151	223	2.2
Average number of freight locomotives in shop or awaiting shop	532	560	d 28	d 5.0	1,474	1,736	d 262	d 15.1
Average number of freight cars in service	260,900	260,776	124	0.1	681,378	649,106	32,272	5.0
Average number of freight cars in shop or awaiting shop	14,535	16,801	d 2,266	d 13.5	36,925	40,327	d 3,402	d 8.4
Home	11,205	14,289	d 3,084	d 21.6	28,463	33,359	d 4,896	d 14.7
Foreign	3,330	2,512	818	32.6	7,572	6,229	1,343	21.6
Tons per train	699	650	49	7.5	615	543	72	13.3
Tons per loaded car	28.4	26.1	2.3	8.8	25.3	22.6	2.6	11.5
Average miles per locomotive per day	62.6	57.7	4.9	8.5	67.6	59.0	8.6	14.6
Average miles per car per day	36.2	33.2	3.0	9.0	33.8	31.2	2.6	11.9
Per cent of empty car-miles	32.7	32.0	d 0.7	d 2.2	29.6	29.5	0.1	0.3
Per cent of freight locomotives in shop or awaiting shop	11.7	12.5	d 0.8	d 6.4	14.2	17.1	d 2.9	d 17.0
Per cent of freight cars in shop or awaiting shop	5.6	6.4	d 0.8	d 12.5	5.4	6.2	d 0.8	d 12.9
Average miles operated—single track	32,655.04	32,625.58	29.46	0.1	110,664.79	110,490.84	173.95	0.2

d Decrease.

average number of freight locomotives in service and of 3.2 per cent in the number of freight cars in service. The number of tons per train was increased from 642 to 715, 73 more tons, or 11.4 per cent, while the tonnage per loaded car was increased by 2.7, or 10.7 per cent. The average miles per locomotive per day increased 5.6, and the average mileage per car per day increased 1.8. The percentage of empty car miles was reduced by 1 per cent. The percentage of freight locomotives and freight cars in shop or awaiting shop was also reduced. The details showing this remarkable increase

from Yeung Kong into Kwangsi Province, with the idea of tapping the Pak Hoi district and connecting that part of the province with Hong-Kong. For the present, however, construction is to be undertaken only to the sea. The railway is a good example of what may be accomplished by intelligent railway work in China. The concern was started with comparatively small capital, and most of its line and equipment have been paid for out of the earnings of the parts of the line already in service. This has been the case with the new extension.



Type of Locomotive on Which Firebox Temperature Tests Were Made

Oil Burning Locomotive Firebox Temperatures

Firebox Temperatures and Boiler Efficiency Increased,
and Smoke Reduced by the Use of the Gaines Wall

TO determine the effect on the temperature in the firebox of oil-burning 2-10-2 type locomotives which were equipped with the Gaines wall, the Texas & Pacific conducted a series of tests from which important data has been obtained. These locomotives are equipped with a Jacobs-Shupert firebox 176½ in. long and a combustion chamber of 42½ in. long. Between the two is located the Gaines wall with five 3-in. air ducts. The principal dimensions of the locomotive on which these tests were made are as follows:

Service	Freight
Fuel	Oil
Tractive effort	62,700 lb.
Weight in working order	324,600 lb.
Weight on drivers	262,100 lb.
Weight of engines and tender in working order	501,300 lb.
Cylinders, diameter and stroke	28 in. by 32 in.
Driving wheels, diameter over tires	63 in.
Working pressure	185 lb. per sq. in.
Boiler, outside diameter of first ring	84 in.
Firebox, length and width	176½ in. by 82 in.
Firebox, type	Jacobs-Shupert
Tubes, number and outside diameter	267—2 in.
Flues, number and outside diameter	41—5¾ in.
Tubes and flues, length	18 ft.
Heating surface, tubes and flues	3,539 sq. ft.
Heating surface, firebox	307 sq. ft.
Heating surface, total	3,846 sq. ft.
Superheater heating surface	886 sq. ft.
Grate area	70 sq. ft.

Contrary to previous practice, temperature readings were obtained at four points in the firebox by means of a platinum rhodium thermocouple in connection with a Leeds & Northrup potentiometer indicator, furnished by the railway department of the University of Illinois, and the readings were taken by Professor J. M. Snodgrass. Eight tests were made, four with the Gaines wall in place and four with the wall removed. The thermocouple locations are shown in Fig. 1. Locations A, B, C and D show points at which temperature determinations were made with the wall in place, while A', B', C' and D' show locations of thermocouple with the wall removed. The thermocouples were introduced into the firebox through holes in the combustion chamber floor and fire pan, the body of the thermocouple being protected from the flame by a water jacket.

As the type of instrument used in these tests was not of a sufficiently rugged character to withstand the jars and shocks incident to a road test, standing tests were conducted by removing the main valves and blowing all the steam generated through the valve chamber and out of the stack. In order to make the tests strictly comparable, an endeavor was made

to keep the oil fired during each test the same, by working the firing valve and the throttle in a constant position. As the results show, however, this did not accomplish the desired effect, as a little more oil was burned without the wall than

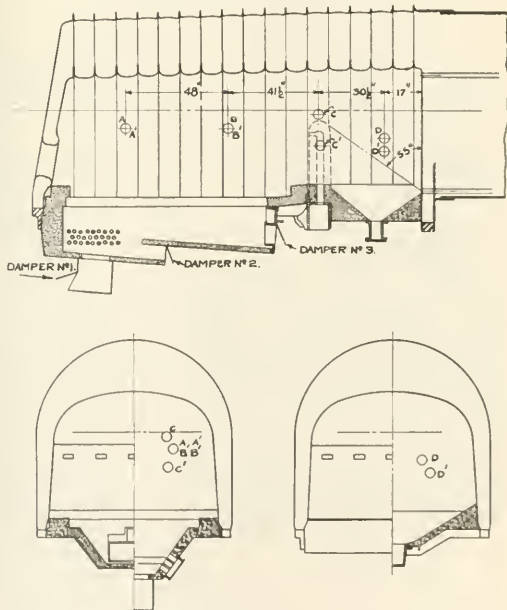


Fig. 1—Arrangement of Firebox Showing the Thermocouple Locations

with it. A Louisiana fuel oil with a gravity of 24 to 30 and heat value of 19,332 B. t. u. per pound was used. In order to compare the results obtained from the standing test with road service conditions two road tests were made, tem-

peratures being taken with a radiation pyrometer inserted through the door.

FIREBOX TEMPERATURE RESULTS

The firebox temperatures obtained during both the standing tests and the road tests are shown in Table I. Fig. 2 shows graphically the maximum temperature ranges, with

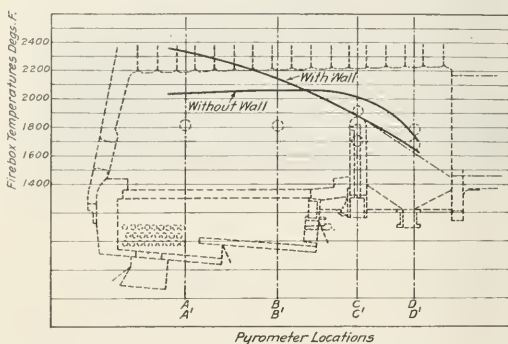


Fig. 2—Range of Temperatures in the Firebox of the Texas & Pacific Oil-Burning Locomotive

and without the Gaines wall, the average temperatures being 20 to 60 deg. lower than those indicated by the curves. It will be observed that with the wall in place, the highest temperatures were obtained in the back part of the firebox; and

TABLE I—AVERAGE TEMPERATURE AND DRAFT.
STANDING TEST—ENGINE 511

Test No.	I. & N. Pyrometer Location	Radiation Pyrometer		Front Door Temp.	Draft		Pounds Oil Burned Per Hour
		Avg.	Max.		Fire	Water	
3	A	2,315	2,330	595	3.8	8.4	3,952
7	A'	2,000	2,040	645	4.1	8.9	4,164
2	B	2,050	2,140	2,045	3.0	7.8	4,004
6	B'	1,940	2,055	2,040	3.8	8.5	4,008
1	C	1,855	1,875	2,315	2.9	8.0	3,139
8	C'	1,960	2,020	2,015	3.9	8.3	4,261
4	D	1,580	1,645	2,025	3.9	8.5	3,607
5	D'	1,710	1,730	2,030	3.7	8.0	4,135

ROAD TEST—ENGINES 500 AND 511

Engine 511, with Gaines Wall...	2,110	\$70	3.3	6.9	*2,157
Engine 500, without Gaines Wall	2,175	600	4.1	7.3	*2,982

Pyrometer Locations A, B, C and D are with Gaines Wall.

Pyrometer Locations, A', B', C' and D' are without Gaines Wall.

* Pounds of oil burned on trip Longview to Marshall, Tex.

that there was a gradual drop in temperatures as the flames approached the tube sheet. With the wall removed, the temperatures in the rear and middle portion of the firebox were fairly uniform, with a decided drop in the combustion cham-

ing them back into the rear portion of the firebox where combustion is most intense; whereas with the wall removed there was no such baffling effect and there was a noticeable short-circuiting of the flames from the burner over into the combustion chamber.

The temperatures shown are probably lower than might be expected in burning fuel oil under these conditions, but with the large volume of the firebox (433 cu. ft.) the heat liberation per unit of volume is reduced and therefore the temperature is reduced.

BOILER PERFORMANCE

Advantage was taken of the opportunity to make some determinations of the evaporative efficiency of a boiler, with and without the Gaines wall. The results of the test are summarized in Table II. With the wall in place, an average of 3,675 lb. of oil per hour was fired, with an apparent evaporation of 47,968 lb. of water; this being equal to an evaporation of 13.05 lb. of water per pound of oil and 12.47 lb. of water per square foot of heating surface. With the wall removed and the same front end draft, the average amount of oil fired was 4,142 lb., with an apparent evaporation of 46,842 lb. of water per hour, or 11.3 lb. of water per pound of oil and 12.18 lb. of water per square foot of heating surface.

The boiler horsepower generated per cubic foot of firebox volume averaged 4.2; while the equivalent evaporation per pound of oil averaged 17.03 with the wall and 14.8 without the wall, the corresponding boiler efficiencies being 85.5 and 74.3, or a difference of 13½ per cent in efficiency, due to the Gaines wall.

The boiler efficiencies are high, considering the rate of firing; but it should be borne in mind that in burning oil there is no loss through the grates and ashpan and no discharge of fuel at the stack in the form of cinders. With the wall in place, combustion was perfect; there being no indication of CO (Carbon monoxide) in the flue gases, and no black smoke issuing from the stack at any time. Under these conditions, practically all the heat loss will be accounted for in the front end gases; and, as shown in Table I, the front end temperatures were uniformly low, considering the length (18 ft.) of the tubes. A tube of this length, used in conjunction with a firebox equipped with a combustion chamber of ample length and volume, will give as low front end temperatures as longer flues used in conjunction with a firebox without a combustion chamber.

With the wall in place, the average front end temperature was 585 deg.; without the wall, 615 deg.; a difference of 30 deg., which accounts for a part of the efficiency shown by the wall. The wall seems to have little or no effect on the superheat in steam, as these temperatures average from 225 to 230 deg. with the wall in place to 225 to 235 deg. with the wall removed.

With the wall removed, smoke emission was very notice-

TABLE II—EVAPORATION, BOILER HORSEPOWER AND BOILER EFFICIENCY

Test No.	Gaines Wall	Oil—Lbs. Fired Per Hr.		Water—Apparent Evaporation			Equivalent Evaporation From and at 212 deg.			Boiler Horsepower		Boiler Efficiency
		Lbs. Per Hr.	Per Cu. Ft.	Lbs. Per Hr.	Lb. of Oil	Per Sq. Ft. Evap. Surf.	Lbs. Per Hr.	Lb. of Oil	Per Sq. Ft. Ht. Surface	Total	Per Cu. Ft. Firebox Vol.	
1	With	3,139	7.25	41,697	13.25	10.84	54,206	17.30	11.45	1,571	3.63	86.8
2	With	4,004	9.25	52,720	13.16	13.70	68,536	17.11	14.48	1,986	4.59	85.8
3	With	3,956	9.12	50,241	12.17	13.06	65,815	16.65	16.65	1,907	4.40	83.5
4	With	3,607	8.33	47,216	13.09	12.27	61,552	17.14	13.07	1,799	4.13	86.0
Ave.	With	3,675	8.49	47,968	13.05	12.47	62,602	17.03	13.22	1,814	4.19	85.5
5	Without	4,135	9.56	47,500	11.48	12.35	62,225	15.05	13.15	1,804	4.16	75.5
6	Without	4,008	9.25	46,036	11.48	11.97	60,307	15.04	12.74	1,748	4.03	75.5
7	Without	4,164	9.61	44,607	10.71	11.60	58,435	14.03	12.35	1,694	3.91	70.4
8	Without	4,261	9.84	49,227	11.55	12.80	64,487	15.13	13.62	1,869	4.31	75.9
Ave.	Without	4,142	9.59	46,842	11.30	12.18	61,363	14.81	12.96	1,779	4.10	74.3

ber space. At a point directly above the Gaines wall location, the temperatures were higher with the wall removed than when the wall was in place, this being due to the fact that the wall has the effect of baffling the flames and throw-

able; and there was considerable fuel wasted, due to the short-circuiting of the oil from the burner into the lower flues, partly unconsumed. Calculations based on the rate of flow of heat through fire brick and boiler lagging indicate

that less than 1 per cent of the fuel used was lost by radiation through the pan and through the boiler lagging.

Air used for combustion was drawn in through dampers 1 and 3, the pipe thimbles in the rear of the fire pan and the air ducts in the Gaines wall, as shown in Fig. 1. Damper 2 was kept closed during the tests, as it was found that air admitted at this point caused a violent drumming in the firebox. The total effective air opening was 540 sq. in., and this was found sufficient to burn 4,000 lb. of oil per hour without making smoke. The gas analysis indicated an air excess of about 40 per cent.

Firebox volume is a very important factor in burning oil. These tests indicate that not more than 9 to 10 lb. of oil per cubic foot of firebox can be completely burned per hour. This is equivalent to 4 to 4½ boiler horsepower per cubic foot of firebox volume.

WASHINGTON CORRESPONDENCE

WASHINGTON, D. C., Sept. 18, 1917.

CO-OPERATION VS. COERCION

On the principle that co-operation is more effective than coercion, which is sometimes expressed by saying that "molasses catches more flies than vinegar," the railroads have abandoned their plans for endeavoring to obtain general increases in the tariff provisions as to carload minimum weights, through approval of the federal and state commissions, and will rely instead on the voluntary co-operation of shippers in the campaign for heavier loading of cars, which is showing such satisfactory results.

In other words, it has been decided that the efforts to make one freight car perform the service formerly performed by

out ways in which the efficiency of existing transportation facilities might be increased in the emergency created by the war, and as one of the most important ways in which efficiency could be increased, it was pointed out that a gain of only two tons in the average load per car would be equivalent to adding over 200,000 cars to the number available for public use.

Railroads were urged to "enlist the co-operation of shippers in loading cars heavier as a war measure, using the services of local agents, superintendents and assistant superintendents, traffic officers, etc., to approach them, concentrating effort on a few friendly ones at first to lead the movement and set the example." It was also suggested that traffic officers be urged to make a strenuous and concerted effort to get the consent of the public to increase carload minima, thereby increasing the weight of commercial units.

In accordance with the first plan, an active campaign has been carried on under the direction of the Commission on Car Service, with the hearty co-operation of the National Industrial Traffic League, the Railway Business Association, and many other large organizations and companies that ship a large tonnage of commodities, together with very material assistance from the Interstate Commerce Commission, many of the state railway commissions and the government departments. The traffic officials also began a concerted movement to revive their efforts to secure increases in the tariff minima, which commercial conditions and commercial habits have prevented from keeping up with the increases in car capacity.

The Western Classification Committee had gone so far as to docket a long list of proposed increases in minimum weights to be submitted to the shippers and later to the com-

**YOUR NATION'S NEEDS
AND YOUR PART IN IT**


Your job during the war is to carry things where the country needs them

What good is a gun, unless you have it where it is needed? What good is a gun without shells—without food for the men who fire it?

Your services are absolutely vital to our country's success in war.

You are a **RAILROAD MAN**

THE NATION IS COUNTING ON YOU.




LOCOMOTIVES & SHRAPNEL



Our Nation needs locomotives as much as shrapnel.

Ordinarily, 15 percent of all the locomotives on our railroads are in the repair shops. By reducing that percentage to 10 we can add 3325 locomotives to the number available for use on our railroads. If we can keep more locomotives in good running order, we will help our country in the war with Germany.

THE NATION IS COUNTING ON YOU



PUT THE RAILROADS AHEAD OF THE GAME

Victory in the war is dependent upon efficient transportation. That's why railroad men must stay on their jobs and see that the railroads of the country do their part.

THE NATION IS COUNTING ON YOU

Posters Emphasizing the Importance of Railways to the Conduct of the War

two partly loaded cars can be made more effective by a campaign of education and by asking shippers as a patriotic duty, as well as for their own interests, to use the full capacity of the available cars when more cars cannot be had, than by seeking to force them to load the small additional tonnage that the interstate and state commissions might allow to be added to the present minimum weights, as provided by tariffs and classifications.

One of the first steps taken by the Railroads' War Board was the issuance of its Efficiency Circular No. 12, pointing

missions and the Official and Southern Classification Committees had planned similar action about the time the Commission on Car Service discovered that its co-operative campaign was producing such results in the way of increased loading that it might not be entirely wise to arouse the antagonism of shippers by an effort to force increased loading by tariff requirements. This view was urged upon traffic officials and the Railroads' War Board, backed up with such convincing evidence of the results of co-operation that after a thorough discussion and many conferences the plan

of the traffic department was discarded for that of the operating men.

It was believed that if approval for any considerable increase in carload minima should be obtained it would be only at the expense of such opposition that the proposed minimum weights might, as a practical matter, come to represent also somewhere near the maximum loading. It was not expected that commissions would allow the minima to be fixed at anywhere near the maximum capacity of the cars, whereas at present many large shippers have issued orders to load to as high as 10 per cent above the marked capacity.

The monthly reports of freight operations compiled for the Railroads' War Board have already shown a remarkable improvement in car loading, although the latest reports, for the month of June, were for a time when the campaign had been in progress for only a few weeks. In June the average car load was increased by 2.7 tons, or 10.7 per cent.

As an example of the results being obtained, it may be stated that in the case of one commodity, on which the classification committee proposed to increase the minimum from 33,000 to 35,000 lb., the principal shippers have voluntarily agreed to load 65,000 lb., and in many instances are placing as much as 100,000 lb. in a car.

THE CO-ORDINATING COMMITTEE ON EXPORTATION

At the instance of the Railroads' War Board, a committee of unusual importance has just been formed to co-ordinate the activities of the railroads, the war department, the shipping board, the food administration and the war commissions of the British and other allied governments that come here to purchase supplies. The committee will be known as the "Co-ordinating Committee on Exportation" and its purpose is to expedite the handling of export shipments by preventing congestion at American seaports and minimizing the danger of export traffic being accumulated and delayed in railroad yards and along the tracks of seaport lines.

Bearing in mind the danger of congestion this winter if effort should be made to ship everything ordered in this country through the North Atlantic ports, the members of the War Board decided that some immediate action should be taken for co-ordinating railroad with overseas transportation.

With the view of laying the foundation for this, representatives of the embarkation section of the general staff, U. S. A., the traffic executive of the Allied governments, the United States Shipping Board, the United States Food Administration, the Red Cross War Council and the Commission on Car Service, met with the War Board and formed the "Co-ordinating Committee on Exportation."

This committee will consist of a representative of each of the organizations named, together with a representative of the Railroads' War Board. Charles M. Sheaffer, chairman of the Commission on Car Service, has been made chairman of the co-ordinating committee. The other members of this committee appointed to date include E. Level, chairman, Traffic Committee of the Allied Governments; J. G. Rodgers, general agent, American Railway Association, military headquarters; R. B. Stevens, commissioner, or D. L. Ewing, director of traffic, U. S. Shipping Board; Col. Chauncey B. Baker, embarkation section, general staff, U. S. A.; C. B. Buxton, U. S. Food Administration, and D. W. Cooke, Red Cross War Board. It is hoped that a representative of the U. S. Navy and of the British Admiralty will also become members of the committee.

The committee will hold regular meetings and will exchange the information necessary to prevent freight congestion, and at the same time keep the tremendous amount of traffic designed for overseas use moving to the various ports and thence by ship to Europe.

RAILROAD WAR POSTERS

Reproductions are shown of part of a series of colored posters prepared at the direction of the Railroads' War

Board, which have been placed in railroad shops and other places where large numbers of employees congregate, for the purpose of emphasizing the important part played by the railroads in modern warfare and the duty of every railroad man to exert his utmost to increase railroad efficiency.

COAL MOVEMENT

The monthly report of the Geological Survey on coal and coke movements on 72 roads for the month of August shows an increase in the shipments of bituminous coal on these roads as compared with July of 16,857 cars, or 2.5 per cent.; and an increase compared with August, 1916, of 68,570 cars, or 10.8 per cent. There were, however, 27 working days in August and but 25 in July. The average daily loading in August was 5.1 per cent less than in July. Daily and weekly reports received by the Geological Survey show that the average daily rate was at its maximum in the first week of July, descended to a minimum by the middle of August and has been slowly gaining since that time.

Judge R. S. Lovett, priority director, has received numerous requests from all parts of the country for priority orders for the shipment of coal, but has issued none since the first, pending the announcement by Fuel Administrator Garfield of his plan of apportioning coal. Meanwhile the Commission on Car Service has been able to give temporary relief to communities and industries in acute need of coal by securing a supply of cars, by expediting shipments and by diverting shipments to places where they were most needed.

Fuel Administrator Garfield on September 14 requested the Export Administrative Board to allow no coal to be exported from the United States without specific licenses, and further that the Board authorize no such licenses before notifying him of the application. This step was taken in order that he might keep in close touch with both the quantity and the destination of coal exports and specifically for the purpose of protecting the Northwest part of the United States, which has been complaining that it has not been receiving its fair share of the coal sent to lake ports. An investigation by the Fuel Administration substantiated this complaint. It was found that plenty of coal was reaching the Lake ports, but it was not getting through to the northwest. In the period between August 24 and September 6, out of a total of 1,755,812 tons, 530,973 tons, or 30.2 per cent had been shipped into Canada. This is far in excess of the proportion of Canadian exports by lake boats in normal times.

The Fuel Administration announced that it does not intend to cut off Canadian exports, but with this supervision it will be able to equalize the distribution of coal, and see that the Northwest and Canada both get their fair shares.

In other parts of the country the situation, while not as serious as in the Northwest, is giving Dr. Garfield concern. New England states, which draw their coal supply from the West Virginia fields by barge transportation from Hampton Roads, have not thus far received as much coal as usual at this time of the year. Seizure of coastwise shipping by the government has made more difficult the problem of supplying these states.

INCREASED RATES IN NEW SOUTH WALES.—In order to meet increased operating costs the Railway Commissioners of New South Wales are now asking for 10 per cent increase in rates and fares.

ARGENTINE-PERUVIAN AUTO MAIL SERVICE.—An automobile service has been put in operation from La Quiaca to points in Bolivia connecting with mail service to Peru. The Post Office Department has given notice that correspondents should indicate upon the cover of mail whether it is desired that it be forwarded to Peru via Chile or via the new automobile route.

National Safety Council Annual Congress

Railway Safety in a Multitude of Phases; Perplexities of Getting Good Work Done by Inexperienced Men

THE sixth annual safety congress of the National Safety Council was held at Hotel Astor, New York City, September 11, 12, 13 and 14. Readers of the *Railway Age Gazette* are interested mainly in the doings of the Steam Railroad Section of the congress; but on this occasion the principal address at the general session, Wednesday, September 12, was made by Marcus A. Dow, general safety agent of the New York Central Lines; and a report of this address was given last week, page 459.

The first session of the railroad section was held on Wednesday afternoon, and the acting chairman was H. J. Bell (C. & N. W.); W. C. Wilson, formerly of the Delaware, Lackawanna & Western, who was elected chairman of the section a year ago, has now retired from railway service. C. M. Anderson (N. C. & St. L.), acted as secretary of the meeting. Eighty-seven railroads now hold membership in the section, an increase of 38 per cent in the number since the last annual meeting.

The first paper was by J. S. Rockwell (B. R. & P.), on the relation of the safety department to war problems.

Participation in the war obviously requires increased endeavor in numerous directions. Some roads have increased and almost doubled the number of safety inspectors during the past year. The necessity of employing inexperienced men, now felt everywhere, imposes grave responsibilities. The new man must be trained; and must be trained with speed; to impress him with the dangers of his work he must be actually "shown"; mere words will not answer. The employment of women in shop and outdoor work introduces new problems; but thus far it is believed that, generally speaking, women are less careless than men. They should, of course, be surrounded by all requisite safeguards. In all matters within his province the safety agent must watch the superintendent and the foreman and see that they do not let down the bars because of the stress of war conditions.

In the discussion on this paper, R. C. Richards (C. & N. W.), spoke of the vast numbers of new men now coming into the service. On his road there is a constant stream. In Chicago an examining class is held every day and new men are taken on by the dozen. The "House that Jack Built" (motion picture), is shown to these men and safety rules are displayed on the screen for their benefit. The screen is also used for showing the good results of the safety organization on that road, with statistics of accidents, showing the improvement that has been made.

B. H. Dayton (N. Y. C.):—We require new men in train service to make three trips over the road and then to fill out a written paper. The man is required to tell what he has learned; then the inspector can clear up his doubts. A special code of safety rules, 40 in number, is used in instructing new men. Of course, we do not get obedience to these 40 rules without persistent questioning. All men, old as well as new, are shown the educational motion pictures; and attendance on these displays is now compulsory.

C. L. Wright (C. St. P. M. & O.):—For new men in the train service we allow three days for study of rules before deciding to accept a man. Written replies are made to a series of questions; and it is found that men who have filled out these blanks make fewer dangerous blunders than were formerly made by men of the same grade.

Replying to questions, a number of inspectors said that the way to discover violations of the rules was for the inspector to be on the job frequently.

C. M. Anderson (N. C. & St. L.) read a paper on the cost

of personal injuries in the matter of time lost. He cited cases where a man in an important position, for example a section foreman, was injured, and the case imposed on the company considerable cost by the necessity of taking a man from some other important work to fill his place, and then perhaps the filling of this second man's place added further disturbance of important work somewhere. The cost to the railroads of the country for personal injuries to employees in one year, as reported to the government, aggregated \$27,000,000. "We all know that 85 per cent of the casualties on railroads are due to carelessness. Officers must personally interest themselves in the problem of reducing this loss, and we, members of the safety organization, must remember that actions speak louder than words."

"Safety, loyalty and efficiency" was the title of a paper by L. E. Abbott (O. S. L.). The problem of the superintendent is to make men contented. Examples were cited of engineers, and others earning large pay for light work, joining in strikes or threats of strikes, even after they had professed their loyalty to the company. Money will not buy contentment. The employee can be expected to be interested in the company only as he is convinced that the company is interested in him.

A central employment bureau is essential to satisfactory selection and appointment of men for the train service. This central bureau should have the final word in the selection of men and also in discharges. The local petty tyrant must be eliminated. Making promotions for causes which cannot be justified will always make trouble. Why do we not more carefully train railroad officers? The government trains its officers, why should not we?

In the discussion L. Boslooper (Mich. Cent.) said that on his road the officers were getting the brotherhoods interested in safety first. Questions are discussed in the lodge meetings and written suggestions from the lodge officers are sent to the superintendent. These suggestions are promptly acted on.

"We enforce the use of goggles, but we do it largely by persuasion. We give the men to understand that this is required because the employer sees the need, not because of any state law or any legal question about liability. Shopmen must be made to understand that they, like other employees, even up to the president, have a duty to each other and a privilege; the privilege of working for the safety of all concerned. We have reduced by 65 per cent the number of injuries to workmen's eyes."

NEW MEN AND THEIR LIABILITY TO INJURY

T. H. Carrow, safety inspector, Insurance Department, Pennsylvania Railroad, presented a study on this subject, an abstract of which follows:

In normal times between 80 and 90 per cent of railroad employees are men who have had at least two years' service and the vast majority of these have many years' experience. Nevertheless, the number of men hired yearly to take care of the labor turnover on some of the larger railroads, even in dull times, is equal to 30 per cent of the total number in the service; while during the present year some railroads, particularly those located in the munition manufacturing districts, are having a yearly turnover equal to the average number of men making full time. After making due allowances, it is assumed that the turnover in the United States at the present time is equal to at least 900,000 men yearly. On the basis of reports made to the Interstate Commerce Commission

and the experience of a large railroad an estimate is made as follows:

Occupation	Number in service	Annual turnover
Station men, except agents.....	175,279	171,000
Train service men.....	325,799	99,000
Shopmen.....	407,729	180,000
Trackmen.....	397,053	387,000
All other employees.....	490,140	63,000
Total	1,800,000	900,000

On some of the larger roads about 33 per cent of the total number of injuries to employees occurring at the present time involve men who have been in the service less than six months, while nearly one-half of these occur to men who have been in the service less than thirty days. On the basis of reports made to the Interstate Commerce Commission for three months ending with September, 1916, it is estimated that there will be 3,024 fatalities and 192,788 injuries to railroad employees during the present year; and using the above percentage 64,618 of the injuries and fatalities will involve men with less than six months' experience while more than 30,000 will involve men with less than one month's experience.

Trainmen's work, getting on and off cars, walking on top of trains, setting and releasing hand brakes, coupling and uncoupling, etc., involves hazards which experience alone can teach a man to ward against. In train service, 19 out of every 100 fatalities are recorded as "struck by trains"; and when it is remembered that even the old and experienced men occasionally walk in front of moving trains, it is easily understood why the young and inexperienced man becomes a victim of this menace. And no amount of instruction will take the place of actual experience. * * * As well as the railroads would like to eliminate all short clearances it is a physical and an economic impossibility to do so. However, this is a hazard that can be readily pointed out to the new man. He must not permit his body to extend beyond the line of the cars, except when he has a clear and unobstructed view. * * * Among maintenance of way employees "struck by trains" is the cause of 68 out of every 100 fatal injuries. Loading and unloading rails, frogs and timber is always more or less hazardous even to the experienced man, but with the new man it is doubly dangerous. * * *

Accidents to freight station employees are less serious but more numerous. At some of the larger stations the ratio of injuries among freight handlers, alone, amounts to as much as 75 per cent yearly. Nearly all of the larger freight stations throughout the United States have had a labor turnover during the present year many times greater than the average number of employees in the service. At many stations the entire platform force has quit in a body, their places having been filled by men who had never before had any experience in freight station work. One large station employing 500 men, whose experience corresponds with many others had a turnover in the first 6 months of the year amounting to 2,500 men or five times the number on the pay-roll at any given time.

In normal times the labor turnover among motive power department employees is made up largely of unskilled labor, but the present demand for skilled labor has resulted in the working forces being greatly depleted. Until men become familiar with the layout of the shops they are less likely to ward against natural hazards. * * * Many shops are now employing women, but sufficient time has not elapsed to determine the relation the employment of female help bears to accident frequency.

An excessive amount of property damage is attributable to the inefficiency of new men, particularly in connection with shifting cars in yards. Recent inspections have shown that the damage to equipment during the present year in some cases is 100 per cent greater than in previous years. There

is also a marked increase in loss and damage payments attributable to the same conditions. This point is of great importance, as from a financial standpoint it will justify remedial measures that might be too costly under other circumstances.

The railroads of the United States are doing more business than ever before; there is an unprecedented shortage of men in all departments; large numbers of men are constantly entering and leaving the service; the liability to injury among inexperienced men is much greater than among experienced men; and the railroads must expect a continuance of present conditions.

THE LABOR SHORTAGE

Howard Elliott (Los Angeles & Salt Lake) commented on Mr. Carrow's paper substantially as follows:

Mr. Carrow's excellent analysis of the causes of accidents is a most valuable contribution to safety literature. We see that a large proportion of personal injuries are suffered by new men who take the places of old men that leave because they are dissatisfied with working conditions or rates of pay. Railways cannot afford to pay the high wages that are being paid by outside industries, and our efforts must be confined almost altogether to improving the working and living conditions.

Railroading is a system of voluntary relationships. Our employees stay because the glamor of the transportation business appeals to them, and because they know the work is steady. They go because of the higher wages or easier work. The problem of the railway officer today is to maintain good discipline tempered with generous treatment. Men must be made to feel that we appreciate their staying with us, and that we are glad to have them submit suggestions for improving the service. It is possible for officers to fraternize with employees in close fellowship without breaking down the discipline or esprit de corps of the organization. Witness the efficiency and splendid morale of the French army, where that system prevails. Inspired men will suffer, bleed, and die for a principle. We must inspire our men with the thought that transportation is as necessary in winning this war as bayonet charges. * * *

We should pursue a policy of full and free publicity regarding the affairs of our companies. Our employees should be given information about the capitalization of companies, who the stockholders are, what our plans are, and all that sort of thing. Vice-President Foley of the Illinois Central has just started a campaign of that kind, and it embodies an idea which I have long held.

We should have on every road an employment bureau where each man's record is carefully kept, and where square pegs are assigned to square holes. We should abolish government by chief clerks, and have orders issued only by men who have been on the ground and are able to visualize the men and the conditions affected by the orders. The issuing of orders by clerks who never get out on the road is taking the starch out of some of the best railroad men in the country.

We should hold open meetings of officers and employees where each man can voice his opinion about the conduct of the company's affairs. We must tell employees the *why* of every move required of them, and if we have practices that cannot stand the acid test of reason, the sooner they are abolished the better.

We should shun red tape as a pestilence. We should give the man on the ground all the authority that he proves himself capable of shouldering. We should cut out 50 per cent of our letter writing. Is it a far cry from red tape to new men? New men are hired to take the places of old men who have become dissatisfied with conditions. Nothing creates dissatisfaction so quickly as a system of red tape which dwarfs the initiative of the individual.

We should provide places of amusement at terminals, a

Young Men's Christian Association, or club rooms where men can spend their time when off duty in wholesome pleasures. We should assist in every way practicable in the passage of laws promoting temperance. The saying is: "The Lord looks after drunken men and babies," but the records of personal injuries on our roads bear mute testimony to the falsity of that proverb.

We should build good houses for our section forces, and provide good accommodations for freight handlers, such as smooth floors in our warehouses, good trucks and adequate facilities for comfort. We should be liberal in the granting of passes. Instead of a rule requiring five years' service for a trip beyond Chicago, reduce it to two. We should have a system of increasing the pay of laborers the longer they stay and should grant bonuses to men who stand head and shoulders above their fellows in performance. We should encourage employees to subscribe for educational courses, and make it easy and inexpensive for them to do so.

Pressure should be brought to bear on Congress to waive the literacy test for track and shop laborers, the same as has been done with agricultural workers. A man doesn't need to know how to read in order to handle a pick or a shovel. The agreement about admitting Asiatics should be revised so as to permit 200,000 of them to come to this country under a bond providing for their return at such time after peace shall be declared as Congress shall prescribe. Japanese section foremen in the West are excellent workers, and they get along well with Mexican laborers. Chinese make good track men; they are quiet, of good disposition, and do not often get drunk.

There is a tremendous amount of needed improvement work on railways which has been authorized but not commenced because of no laborers. Allowing 200,000 Chinese to come into this country for the duration of the war may easily mean the sending of 200,000 fewer of our own beloved Americans to bleed and die on the fields of France.

DISCUSSION

S. G. Watkins (B. & M.): Accidents do not happen; they are manufactured. In nearly every case somebody fails to do what he knew should be done. The experienced foreman should be made to understand that he is responsible for the conduct, as regards their own safety, of inexperienced men. Let us put forth a mighty effort to improve our experienced men.

A number of members spoke of the perplexities incident to the present scarcity of good men. In freight houses and on track work some men who are hired will quit the same day, and many on the first pay day. Other large roads quoted figures concerning "turnover" as striking as those given by Mr. Carrow. In some yards the damage to freight cars has increased 100 per cent.

E. J. Birmingham (Erie): Among other measures to keep workmen contented on track work, we have a camp train with a good cook, a chef from the dining car department. Men without money are helped to get board and other accommodations until they can earn a little. Members of the safety committees on the Erie are allowed a bonus over and above their regular pay; this keeps them alert. The Erie now has employed in its shops 140 women, and during the three months that they have been in the service there have been 45 injuries to women. An improvement has been made in first aid kits by introducing smaller boxes; many such outfits have a larger number of articles than are needed.

In connection with this discussion, the New York Central's poster showing dangers at highway grade crossings was passed around among the members. W. H. Cameron, secretary of the National Safety Council, Chicago, has arranged to have copies of this poster printed in one color at five cents each for 6,000 copies and at lower prices for larger quantities. In three colors the prices would be higher.

ACCIDENTS IN GETTING ON AND OFF CARS

This was the title of a paper by C. H. Baltzell, superintendent of the St. Louis-San Francisco at Fort Smith, Ark. Few men habitually get on and off properly. The use of the oil box as a step should be forbidden. Men should be cautioned against catching the front end of the caboose. Every superintendent should make a strong crusade, as has been done by street railroads in cities, to instruct passengers how to get on and off.

Many personal injuries are due to what may be called a remote cause, namely, the neglect of men to rest properly when they are off duty. Men sometimes are tired out before they have half completed their trip. The railway officer must consider home conditions. Many times a careless man can be made more careful by having him bring his wife to the office for a conference. On the Frisco there is a woman's league for safety first. The division officer must take personal interest in safety; notice all disregard of rules and talk to the offender in a business-like and sincere way. The officer should discourage mischievous tattling. The officers themselves, if alert, will see violations of rules with sufficient frequency to be able to correct wrong practices.

Under the present war conditions the teaching of new men is an everyday duty. Go into the smallest details. The new man has the difficult task of learning in three months that which we learned in three years. Encourage athletic activities among employees. The athletic man is more careful and safe than one who is untrained; he learns to cultivate presence of mind, which is a main element in avoiding bodily injury to oneself.

Cultivate the young men; this will improve you as well as the young man. Encourage him to come to your office.

In the discussion on this paper H. J. Bell (C. & N. W.) explained the form for reporting personal injuries now in use on his road, based on that which was recommended at the congress last year in Detroit. Accidents which afford specially striking lessons, such as when an experienced conductor jumps off his train in front of one on another track, are made the subject of special safety bulletins, to be sent all over the system. The North Western has bulletin boards at 400 places. Besides posting on these boards, copies are sent to individual employees.

A desultory discussion on the right way to get off a moving train resulted in a good deal of difference in opinion and it was voted to have the secretary gather information on this point.

OTHER PAPERS

Accidents in Use of Tools and Machinery was the subject of a paper by David More (U. P.). Mr. More called attention to the great progress in the promotion of safety which has been made by the introduction of improved tools. For example, the electric overhead crane has done away with many injuries. The electric flue welder eliminates danger from flying sparks.

All tools are inspected monthly, and the inspector has to make a written report to the foreman. The Union Pacific has spent \$20,000 for guards on machines. The speaker invited all members to visit his shops and to criticize as severely as they could. Two kinds of men must be eliminated, the satisfied man and the dissatisfied man; the man who is wanted is the unsatisfied man. He is the man who is bigger than his job and who will progress.

Proper Handling of Track and Bridge Material was the subject of a paper by J. T. Broderick (B. & O.). Unskillful handling of rails and heavy timbers is a chief cause of accident to workmen in this department. An air hoist should be used, wherever possible, in unloading rails. Rails should always be loaded with heads up and with wooden strips between. In lifting rails from the ground tongs

should always be used. The speaker gave careful details of the right way to use rail laying machines and other appliances. The foreman who avoids hasty language is an important safety asset. Work should be discontinued when a train passes on any adjacent track. Tie tongs should be used in lifting ties, especially treated ties. Gloves must be used where necessary to avoid poisoning of the hands. Self-dumping ballast cars are a desideratum; men are injured in using old and unsuitable cars. In the discussion on this paper C. B. Floyd (N. Y. C.), emphasized the necessity of talking safety every day; the safety inspector should perform his duties before the eyes of the workmen. This inspector can make or break all our safety records.

Safe Operation of Hand and Motor Cars was the subject of a paper by S. G. Watkins (B. & M.). On the Boston & Maine the accident record has been reduced by abolishing iron handles on hand cars and using first quality hickory, the handles being made in the company's shops. Also, the foremen are directed to test handles occasionally. All motor cars have been fitted with a rail across the front, 18 inches high. Foremen should be instructed in the proper loading of motor cars; they must not be over loaded; men must not sit on the front end where a quick stop would throw them to the ground and they would be run over. Tools and other things carried on the cars should be made secure in their position. Always have the men seated before starting the car. Excessive speed must constantly be guarded against; foremen often run 30 or 40 miles an hour without realizing the speed. Foremen must inform themselves fully as to the right to the road before they start out; impatience because operators do not get information promptly is a fault to be guarded against. Bulletins telling of accidents which occur, and containing suitable admonitions are circulated frequently among the men.

In the discussion of this paper, F. N. Loughnan (L. V.) described experiences on his road under war conditions. Track foremen have difficulty nowadays in keeping competent flagmen in service. The supervisor has difficulty in finding foremen who are good leaders of men. Many times the explanation of ill-success in the case of a foreman is that he has a disagreeable personality. The Lehigh Valley limits the speed of motor cars rigidly to 20 miles an hour; and has had no trouble from excessive speed. The men in charge are required to have a knowledge of road rights as good as that of trainmen. There are fewer accidents in the use of motor cars than with lever cars. Every foreman has at hand a telephone, either at his car house or in the shape of a train telephone to carry on the road, so that he can communicate with the despatcher at any time.

A section should have a car of sufficient capacity for its work; use a trailer for tools if necessary. A foreman should be competent to inspect his car in detail and should do so every day. The motor cars on this road have two-inch blocks at the edges to prevent bars and other tools from falling or sliding off. Pick handles are taken out of the picks so that they will require less space and be carried more safely.

Protection of Men Working on Tracks was the subject of a paper by S. S. Morris (Ill. Central). Everything depends on the foreman. The first-class foreman has no scarcity of men and he makes very few reports of employees injured. One of his chief difficulties is handling men who are too young or too old; these constantly require his attention.

In the discussion on this paper R. C. Richards (C. & N. W.) said that on his road, when an employee is injured, a letter is sent to the victim and also to each man in his crew to impress that particular lesson at the right time.

S. G. Watkins (B. & M.): I make monthly studies of the accident records, taking a different class of men or of accidents each month; and give the results to the 150 members of safety committees.

F. W. Mitchell (N. Y., N. H. & H.): On our road every employee who is injured sufficiently to lose time, must, before again going to work, appear in person before the superintendent (or in the case of a shopman, before the shop foreman). The superintendents agree that these interviews are profitable.

INSPECTION OF CARS AND ENGINES

This was the subject of a paper by C. A. Cochrane, superintendent of safety of the Great Northern. The foreman of inspectors must be an enthusiast. All instructions must be in plain language; talk concrete things. Men should be instructed by rehearsing at length the procedure required in the inspection of cars. Inspectors should examine lading as well as cars, especially where the lading is on two cars. Look out for holes in the floors of stock cars, searching on the underside. The speaker presented a long and careful statement of the things to be attended to by the inspector of locomotives.

The election of officers of the steam railroad section resulted in the choice of H. J. Bell (C. & N. W.) as chairman; T. H. Carrow (Penn.), vice-chairman, and C. M. Anderson (N. C. & St. L.), Nashville, Tenn., secretary.

EXHIBITS

In connection with this congress, a display of safety devices was shown in the Grand Central Palace, Lexington avenue, the exposition being managed jointly with the American Museum of Safety, of New York City. Following are the names of the proprietors of some of the exhibits which are of special interest to railroad men:

Aear Mfg. Co., New York, N. Y. Blue flag signal.
American Abrasive Metal Co., New York, N. Y. Safety treads.
American Mason Safety Tread Co., Lowell, Mass. Safety treads.
Anti-Saloon League, New York.
Baltimore & Ohio Railroad.
Clipper Belt Lacer Co., Grand Rapids, Mich. Belt lacers.
Commonwealth Steel Co., St. Louis, Mo. Passenger car upright end-frame, etc.
Detroit Fuse & Mfg. Co., Detroit, Mich. Safety motor starting switches.
Durand Steel Locker Co., Chicago, Ill. Steel locker.
Edison Storage Battery Company, Orange, N. J.
Fire Gun Co., New York, N. Y. Fire extinguishers.
First Aid Equipment Company, New York.
Fyr Fyter Company, Dayton, Ohio. Fire extinguishers.
Hardy & Co., S. H., New York. Goggles.
Julius King Optical Co., New York, N. Y. Goggles.
Krantz Mfg. Co., Inc., Brooklyn, N. Y. Safety locked switches.
Merry Optical Co., Kansas City, Mo. Goggles.
Metropolitan Electric Mfg. Co., Long Island City. Panel switch boards.
Mine Safety Appliance Company, Pittsburgh, Pa. Assortment of danger signs.
New York Central Railroad.
New York Edison Company.
Norton Company, Worcester, Mass. Grinding wheels.
Palmer Electric & Mfg. Co., Boston, Mass. Electric switches.
Peelle Co., Brooklyn, N. Y. Fireproof self-opening freight doors.
Pyrene Mfg. Co., New York, N. Y. Fire extinguishers.
Southern Railway Company.
Standard Optical Company, Geneva, N. Y. Goggles.
Standard Pressed Steel Co., Philadelphia, Pa. Shaft hangers.
Strong-Kennard & Nutt Co., Cleveland, Ohio. Goggles.
Universal Safety Tread Co., Waltham, Mass. Safety treads.
West Disinfecting Co., New York, N. Y. Disinfectants.
Western Electric Co., New York, N. Y. Davis flood lights.
Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa. Shop safety appliances.
Wilson, T. A. & Co., Reading, Pa. Goggles.
Woolf Laboratories, Inc., New York, N. Y. Disinfectants.

Motion pictures were shown at the exposition in the afternoon and evening, among these being "The Rule of Reason," recently brought out by the New York Central, and another picture showing the welfare activities of the Baltimore & Ohio.

TRADE WITH RUSSIA GROWS.—Exports from this country to Russia increased from \$31,000,000 in 1914 to \$558,584,000 in 1917, according to a compilation by the National City Bank. This increase since 1914, while largely war material, included also railway supplies and material, automobiles, metal working machinery, leather, copper, steel rails, railway cars, wire, and miscellaneous manufactures of iron and steel.

RESULTS OF THE M. C. B. LETTER BALLOT

At a meeting of the Executive Committee of the Master Car Builders' Association, held in Chicago on June 14, 1917, a letter ballot containing 108 questions suggested by the various committees was formulated to be submitted to the members of the association. Of these 108 questions five were rejected by the members, as follows: Specifications for journal box packing, the need for specifications covering freight car lubricants, the revision of section 41 in the specifications for lumber, the advancement of journal bearings for passenger and freight equipment to standards, and the revision of M. C. B. sheet U-11 regarding the pulleys,

Sizes and dimensions for solid steel wheels. (It was also voted to change the name to wrought steel wheels.)
Truck side bearing clearance.

Limiting Dimensions for Pedestal Jaws for Cast Steel Truck Sides.—It was voted to change the limiting dimensions B for the 70-ton truck frame which are given on M. C. B. sheet 8 to the following:

Truck frame, maximum 5-15/16 in., minimum 5 7/8 in.
Journal box, maximum 6-1/16 in., minimum 6 in.

LOADING RULES

Rule 9.—Rule 9 has been changed to read: "Lading on single cars must never project over the end sill of the car unless such overhang is protected by an idler or carrying car forming part of a group of cars. See Fig. 1." Note.—Fig. 1 is to be revised to conform to this rule.

Rule 12.—The principal change in this rule was in the second sentence. It was changed to read: (B) "Hemlock or similar wood may be used only for the following loads: For single loads of stored lumber, rules 32, 33 and 34 (Figs. 5 and 6); for loading of tan bark, rules 60, 61, 62, 63 and 64 (Figs. 22 and 23); for loading of slab wood, rule 66; for lading of laths, rule 66a (Fig. 24) and for chocking and blocking for any load.

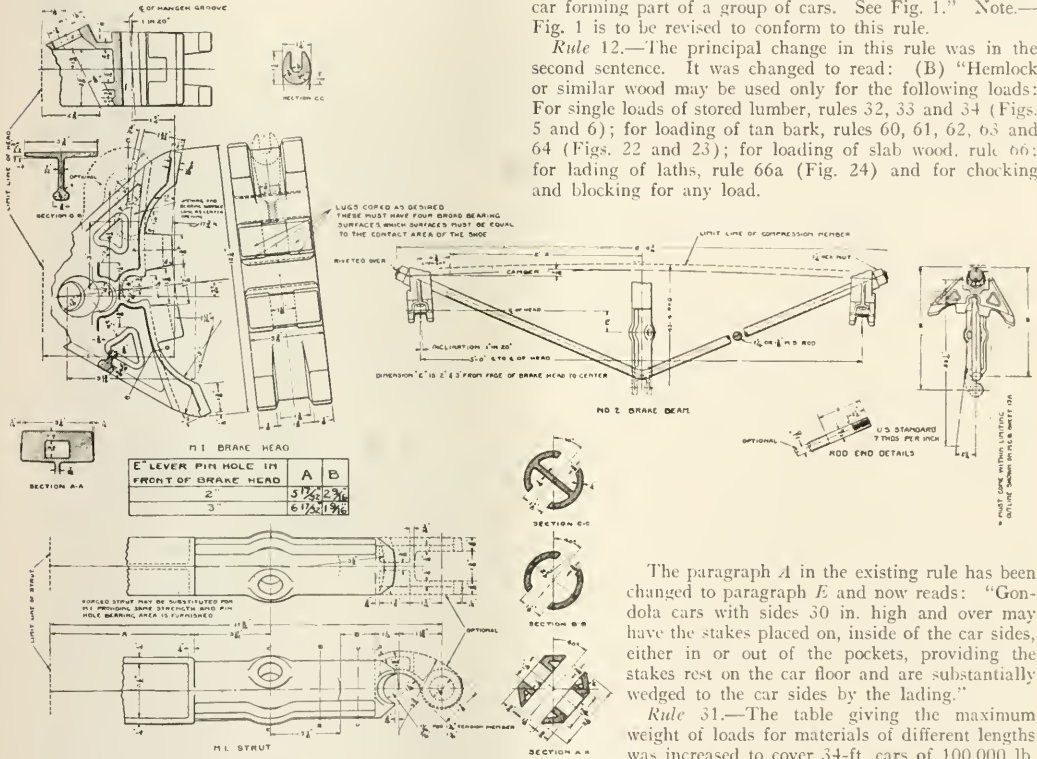


Fig. 1.—No. 2 Brake Beam Adopted as Recommended Practice by the M. C. B. Association

pulley seats and pulley keys for electric lighting equipment of passenger cars.

Following is an outline of the more important questions submitted to letter ballot which were accepted:

STANDARDS AND RECOMMENDED PRACTICES

The following items listed in the 1916 proceedings as recommended practices are advanced to standards:

Specifications covering dimensions and tolerances for solid wrought steel wheels for freight and passenger car service.

Minimum thickness for steel tires.

Wheel tread and flange for steel and steel tired wheels. (It was voted to have this measure cover steel, steel tired and cast wheels, thus eliminating the circumference measure for cast iron wheels shown on sheet M. C. B. 16-A.)

Roundness gage for solid steel wheels.

Plane gage for solid steel wheels.

Lining for outside-framed cars.

Rule 33.—In the first line after the word equal, change the word "width" to "thickness" and add after the word "side," in the eighth line, the following: "Provided that strips will not be required if load does not extend more than 30 in. above the top of car sides."

Rule 34.—Section D is changed to read as follows: "For loads of lumber lapped or stripped in accordance with rule 33, size of hardwood stakes must not be less than:"

Rule 58.—The second paragraph of this rule has been changed to read as follows: "When lading is in two piles on flat or gondola cars and ends of poles are interlaid at center of car as per Figs. 18, 19, 20 and 21, there must be not less than three pairs of stakes per pile, or six pairs of stakes for the total length of load." Figs. 18, 19, 20 and 21 are to be revised to conform to these changes.

Rule 67.—A note has been added to this rule reading

being put on beams developed the fact that they weigh all the way from 6½ lb. to 21 lb. apiece, with the result in the first case that the shoe cracks and works out, and in the second case an unnecessary amount of malleable iron is being purchased. In the design of the brake head, the pot-hook opening is shown at the center as the committee feels that the center hanging is correct. However, an optional location shown by dotted lines in Fig. 1 for the pot-hook opening at the upper end of the head is permitted. The specifications and tests of brake beams were also revised.

CAR WHEELS

The 33-in. cast iron wheel shown in Fig. 2 was adopted as recommended practice for cars of maximum gross weight not to exceed 210,000 lb.

The 33-in. 700-lb. cast iron wheel shown in Fig. 3 was adopted as recommended practice in place of the present 675-lb. wheel of the same diameter.

TRAIN LIGHTING AND EQUIPMENT

The following paragraphs of the specifications for electric lighting of passenger equipment cars, were advanced from recommended practice to standards:

- Paragraph 1. (System voltages.)
- Paragraph 5. (Mounting.)
- Paragraph 6. (Axle pulley and bushings.)
- Paragraph 9. (Size of ball bearings.)
- Paragraph 10. (Boxes, design.)
- Paragraph 12. (Dimensions of battery trays.)
- Paragraph 13. (Connections.)
- Paragraph 14. (Charging receptacles.)
- Paragraph 16. (Terminals.)
- Paragraph 19. (Switchboards.)
- Paragraph 20. (Fuses.)
- Paragraph 21. (Insulation of conduit and wire.)

It was voted to substitute an open end link fuse for the closed end link fuse now shown under these specifications.

TANK CARS

A number of changes were made in the specifications for tank cars, most of which are minor in character and as a rule do not change the substance of the present requirements. A new set of specifications called Class V Tank Car was adopted for the use of chlorine and sulphur dioxide.

115,000 FREIGHT CARS DISTRIBUTED

Fairfax Harrison, chairman of the Railroads' War Board, has authorized the following statement:

Some conception of the efforts which the railroads of this country are making to handle the tremendous increase in freight traffic which the war has produced may be gleaned from a report just compiled by the Commission on Car Service.

The report shows that during the four months' period between May 1 and August 31, this year, 115,152 empty freight cars were ordered into the South and Southwest to protect the movement of grain and other food products and assure the prompt delivery of the millions of feet of lumber needed by the government for the cantonments and shipyards. Several thousand of these cars were also used to facilitate the movement of phosphate rock and other materials needed in the manufacture of munitions. The cotton carrying railroads also received large consignments of "empties" to enable them to meet the beginning of the cotton and cotton seed movement. Most of the cars moved into the South and Southwest are owned by roads operating in other sections of the country. They were moved, however, regardless of ownership into the districts where they were most needed. The prompt compliance of the roads owning them with the orders of the Commission on Car Service averted what might easily have been one of the worst freight congestions in the history of the country, as the lines in the South and Southwest have been called upon to transport an unexampled volume of freight since the United States entered the war.

The movement of lumber for commercial purposes has been

unusually heavy and added to that has been the government's demand for the 64,000 carloads of timber needed in the construction of the training camps for the new national army and the thousands of other carloads that are being rushed from the Southern forests to the shipyards of the Atlantic coast.

Coincident with the lumber movement, grain, melons, vegetables and other food products have created a demand for cars that would have been impossible to meet if the railroads of the country had not voluntarily agreed to merge their competitive activities and operate as one system during the period of the war. This agreement made possible the shifting of empty cars into districts that would have been virtually buried under the abnormal amount of freight accumulated in them if the local lines had not received help from their competitors.

At the present time hundreds of empty cars are still being rushed into the South to assure the prompt movement of all government orders for lumber. Hundreds of other "empties" are going into the Central States to protect the grain crop, the transportation of which is now being complicated by the fact that during the next six weeks, when the grain movement will be at its height, the railroads will be obliged to run a large number of special passenger trains to carry the 687,000 citizen soldiers to the cantonments.

Long trains of stock cars are also moving into Western Texas, so that the thousands of heads of cattle that are threatened by the drought there may be moved into more fertile pasturage.

The railroads operating in Maine will soon receive an extra consignment of empty cars to enable them to handle the potato crop. A summary of the roads that receive consignments of empty cars from other roads during the four months' period ending August 31, together with the number of cars sent to each, is as follows:

Alabama & Vicksburg, 750; Alabama, Tennessee & Northern, 1,012; Atchison, Topeka & Santa Fe, 500; Atlanta, Birmingham & Atlantic, 1,275; Atlantic Coast Line, 8,500; Carolina, Clinchfield & Ohio, 800; Central of Georgia, 2,400; Charleston & Western Carolina, 250; Chicago Great Western, 1,500; Chicago & Alton, 1,225; Chicago, Findlay & Fort Wayne, 200; Chicago & Eastern Illinois, 1,395; Chicago & Northwestern, 500; Chicago, Indianapolis & Louisville, 250; Chicago, Peoria & St. Louis, 200; Chicago, Rock Island & Pacific, 3,600; Chicago, St. Paul, Minneapolis & Omaha, 1,500; Cincinnati, Bluffton & Chicago, 16; Cincinnati, Indianapolis & Western, 1,300; Delaware & Hudson, 48; Fort Worth & Denver City, 118; Georgia, 575; Georgia & Florida, 575; Georgia, Florida & Alabama, 30; Georgia Southern & Florida, 250; Gulf Coast Lines, 2,125; Gulf, Florida & Alabama, 275; Gulf, Mobile & Northern, 650; Gulf & Ship Island, 870; Illinois Central, 8,640; International Great Northern, 159; Kansas City, Mexico & Orient, 1,530; Kansas City Southern, 200; Lake Erie & Western, 300; Louisiana & Arkansas, 700; Louisville & Nashville, 10,497; Louisiana Ry. & Navigation Co., 1,212; Memphis & Meridian, 250; Minneapolis & St. Louis, 1,050; Missouri, Kansas & Texas, 2,200; Missouri & North Arkansas, 300; Missouri Pacific, 6,241; Mississippi Central, 685; Mobile & Ohio, 7,953; Nashville, Chattanooga & St. Louis, 4,350; New Orleans Great Northern, 700; Norfolk Southern, 1,909; Richmond, Fredericksburg & Potomac, 200; San Antonio & Aransas Pass, 250; San Antonio, Uvalde & Gulf, 183; Seaboard Air Line, 3,500; Southern, 8,277; Southern Pacific, 1,800; Soo Line, 1,400; St. Louis & San Francisco, 2,165; St. Louis Southwestern, 8,003; Sunset Central, 1,687; Tennessee Central, 100; Texas Mexican, 158; Texas & Pacific, 1,205; Toledo, Peoria & Western, 450; Toledo, St. Louis & Western, 450; Tremont & Gulf, 100; Union Pacific, 250; Vandalia, 200; Wabash, 2,500; Western Maryland, 200; Western Pacific, 500.

Roadmasters' Thirty-fifth Annual Convention

Abstracts of Committee Reports and Papers Presented
at the Meeting Which Was Held This Week in Chicago

THE thirty-fifth annual convention of the Roadmasters' and Maintenance of Way Association was held at the Auditorium Hotel, Chicago, on Tuesday, Wednesday and Thursday of this week. The meeting was characterized by unusual interest in the reports and papers presented. Because of the unusual conditions in the maintenance of way department which have arisen during the past year, the program for this convention was revised radically at a meeting of the executive committee held in July to concentrate attention upon those phases of the present situation which are of the greatest concern to track men.

The officers of the Association during the past year were: President, M. Burke, roadmaster, Chicago, Milwaukee & St. Paul, Chicago; first vice-president, A. Grills, general roadmaster, Grand Trunk, St. Thomas, Ont.; second vice-president, J. B. Oatman, roadmaster, Buffalo, Rochester & Pittsburgh, Du Bois, Pa.; secretary, P. J. McAndrews, roadmaster, Chicago & North Western, Sterling, Ill.; treasurer, W. H. Kofmehl, Elgin, Ill.

The convention was called to order at 9:30 Tuesday morning by President Burke and all addresses of welcome and similar formalities were eliminated. President Burke outlined the reasons for holding the meeting this year, describing the difficulties which confronted the roads and emphasizing the importance of the opportunity offered at the convention for thorough discussion. He emphasized the necessity of maintaining the track as well as possible under present adverse conditions with the acute labor shortage, lack of many materials and unusually heavy traffic.

R. H. AISHTON SPEAKS

R. H. Aishton, president of the Chicago and North Western and chairman of the Central Department of the Railroads War Board, outlined the manner in which the railways handled troops and materials to the Mexican border last year. He described the prompt action of the roads in organizing for the present war and described the manner in which they have co-operated in handling unusually heavy business without interference with the prompt movement of troops and military supplies. He emphasized particularly the excellent co-operation of the railway employees of all classes in helping to win the war. He predicted serious times ahead for all railway men, stating that precedents are worthless and that each problem must be solved on the basis of present-day conditions as it arises. American roads are taking up slack and are subordinating their interests to those of the country.

SECURING AND RETAINING TRACK LABORERS

It goes without saying that the first and best method of securing laborers to work on tracks is to offer them inducements equal or superior to those tendered by other companies or individuals employing similar help, while to retain them after we do secure them, we must accord them privileges and permanent employment consistent with the best interests of the employer and employed. On sections or other locations where labor headquarters are permanent every effort should be made to encourage trackmen, either laborers or foremen, to own their own homes. A foreman should be assured of the permanency of his position by his superiors and he, in turn, should impart such knowledge to the men under him to make them feel that they have an interest, not only in their work, but in their home town. The number of men should be the same in winter as in

summer. No more pernicious custom obtains than that of keeping the men in a section gang guessing during the summer months as to who will be retained and who will be laid off when the first snow begins to fly.

Section foremen should be permitted to hire their own men, and when there are laborers who cannot or will not rent or live in houses of their own, they should be provided with a bunk house at a location convenient to the work and where a certain amount of privacy is insured. This camp should be equipped with a cooking range and other necessary fixtures. A cook of the same nationality as the men should be secured who is able to cook good, wholesome meals.

When a foreman cannot secure his own laborers, they should be furnished by the railroad's authorized agent, but the labor agent's connection with the men should end there. The custom of having the labor agent furnish the victuals and wearing apparel of the men should be discouraged, as this system often results in charges and deductions against the laborer's wages that the men do not know of and in many cases do not owe, causing no end of trouble on pay day. Men for extra forces or floating gangs should be hired by the foreman of the gang when possible, but if he is unable to do so, they should be furnished by an accredited agent employed by the company on a salary, to preclude, as far as possible, the practice of charging men commissions for their jobs.

Bunk shanties or cars should be provided with double-deck steel bunks, good ventilation, wash basins, water coolers and other facilities. The dining car, or dining room should be well ventilated and sanitary and the cooking cars or compartments provided with all necessary utensils and ample storage for supplies. These camps should be conducted by a boarding contractor who will provide them with plenty of good, wholesome food and who will also see to the sleeping accommodations.

If Italian labor is used, the above arrangement may not apply, as these men do not care for cooked meals, preferring to handle their own food. In such cases, only good sleeping quarters are needed, with plenty of water and other sanitary arrangements, and a commissary where they can secure the necessary supplies.

To retain laborers after we do secure them is often easier said than done, and as long as other companies and individuals can offer better inducements than the railroads our men will leave us. With a perfectly clear knowledge of the cause of our shortage of men, our failure to take a firm stand in the matter, both in the men's behalf and our own, is to be deplored. The trouble is and has been that the importance of the track department is under-estimated, and no man comes to work in it who has any pride in himself or regard for those depending upon him because he will be looked down on by men in other branches of the service. The remedy is first, in the compensation we give our laborers and the manner in which we house and feed them; and second, in the treatment we and our foremen accord them and the opportunities offered for earning promotion. We should also furnish them motor cars to carry them to and from their work. All other mechanical tools consistent with the work should be used. As one of our most vital questions at this time, it should not be permitted to drop until relief is secured.

A. M. Clough (Chairman), supervisor New York Central, Batavia, N. Y.

DISCUSSION

The committee recommendation for uniform section forces throughout the year created much discussion. T. Hickey, Michigan Central, and D. O'Hern, Elgin, Joliet & Eastern, stated that much work such as gaging track and tightening bolts can be done satisfactorily during the winter keeping the men busy in constructive work. P. J. McAndrews, Chicago and North Western, pointed out the fact that the lengthening of the working season reduced the number of men required. The present practice of hiring men for a few months creates an abnormal demand during the summer, leading to excessive competition and abuses. He believes permanent forces are applicable to 80 per cent of the railway mileage. Coleman King, Long Island, described a plan in effect on his road for the last three years, whereby men are guaranteed permanent employment for the entire year and stated that over 90 per cent of the men now in service have been with the road over one year in spite of the present labor conditions. J. B. Oatman, Buffalo, Rochester & Pittsburgh, told of his inability to increase track forces appreciably above the winter basis, although authorized to put on many more men last spring.

The operation of boarding camps was also the subject of extended discussion. George Beckingham, Grand Trunk, strongly favored company operated labor bureaus and boarding camps, believing laborers would come to the company operated employment bureau first, and that more satisfactory results would be secured. Other members strongly condemned present conditions in boarding camps and urged that the companies take them over.

THE INSPECTION OF TIES IN TRACK FOR RENEWALS

1. To secure uniform practice and to prevent the removal of ties from track before their safe service life is exhausted and at the same time to distribute renewals properly in all tracks, ties for renewals should hereafter be marked by inspectors reporting directly to the supervising officers.

2. When the season arrives for the inspectors to start out, after conferring with their superior officers, they will inspect one mile of main track on each section in order to allow the section forces to begin tie renewals. They will then complete the inspection of all ties in main tracks and sidings on all sections. Inspectors will make a daily report to their superior officers on the proper form, showing the number of ties marked for renewals in the main track between each two mile posts and the number of cross-ties, switch ties and cross-over sets marked for renewals in each siding, giving the siding numbers.

3. Section foremen must in all cases accompany the inspector over their sections while the inspection is being made. For 1917 renewals one heavy white mark must be placed on the rail above each tie to be renewed, this mark to be placed on the west side of the west rail. Inspectors should keep a book record of all inspections, to be used from year to year for comparison.

4. There should be two standards for marking ties for renewals: (1) Where the track is not to be disturbed and (2) where the track is to be raised off the old bed. In the latter case, ties should be inserted while the track is being raised, thus placing them on the new bed. In the former case, ties should be dug in.

5. Inspectors should be provided with inspection picks, paint brushes and the necessary white lead paint.

6. Inspectors should be furnished with a statement showing the location of all track which is to be raised on each section, also the track where new steel is to be laid and re-ballasted.

7. Every tie which apparently is not good or which shows signs of decay or failure must be inspected with the pick.

8. In determining the necessity for replacing a tie, its condition as to decay and wear, the amount and character of the traffic carried, its position in track, the kind of timber, the condition of neighboring ties, the weight of rail and tie plates must all be considered.

9. Case 1—Ties should be inspected for the condition of timber by driving the pick into each side adjacent to the rail seats, near both the bottom and the top faces, below the sap line. The pick must be driven into the ties toward the center and must be drawn with as little prying as possible. Ties should not be tested on the top, with the exception of making tests for decay around tie plates and spikes. In making these tests, the ties should not be mutilated more than absolutely necessary. To test a tie for strength, one end of the pick should be inserted under the end of the tie and the pick used as a lever. If a tie is broken under the rail seat this method will usually determine it.

a. If two ties of only one year's safe service are together, one must be removed, and a group of ties of only one year's safe service, must be so removed as to leave each doubtful tie with one good neighbor.

b. Sap rot alone is not to condemn a tie for service.

c. A tie cut down by railwear is not to be removed unless the rail is cut into the face more than one inch. This applies to ties in tangents, as all ties should be full-plated and protected against rail wear on curves. On curvature where, through repeated rail renewals, ties are necessarily adzed more or less for the new plates, when a tie is so cut down as to weaken it for the service imposed, it should be removed and saved for side-track renewals if the timber is sound. On tangents where a good tie is cut down not more than one inch with rail wear or adzing, it should be protected against further cutting with tie plates.

d. In case ties are spaced too wide apart or where a large hewn tie is removed and replaced with a smaller tie, an extra spacer tie may be inserted, as the judgment of the inspector may decide.

e. Very careful attention must be given to the inspection of red oak and pin oak, also any other kind of timber that decays from the heart, as such ties usually rot from the center, leaving a hard shell, which can only be detected by careful inspection.

f. Where track is subject to heaving, and where shimming is necessary, care must be taken to insure enough good, sound timber for spiking and bracing, and careful attention must be given to the inspection of ties through road crossings, station platforms and other places where they are covered and liable to be overlooked by the section foremen.

10. Case 2—In track where new rail is to be laid or old rail is to be re-ballasted out of face, sufficient renewals should be made to last at least three years, depending upon the conditions, without being disturbed for renewals during that time. Inspectors will make a liberal inspection of such tracks, testing the ties for decay as in Case 1, but removing all ties that will not last more than three years. Where new steel is laid, no bad ties must be left under the joints. In making renewals in this case, some fairly good ties may be taken out, in which case they should be sorted and piled carefully, to be picked up and distributed for side-track renewals.

11. A lower standard of inspection should be used for mine lines and side tracks and especially for standing tracks in yards, where no tie must be taken out of track until its safe service life is exhausted.

12. In passing tracks care must be used to see that ties around turnout curves are in good condition.

13. In main tracks and sidings where the track is not to be lifted, foremen must renew only the ties that are spotted by the inspector, and in case they find ties which,

in their judgment, should be renewed, they will notify their superior officer and the inspector will be sent back to make a re-inspection. Where track is to be raised, the foremen should renew ties marked by the inspector and remove any unmarked ties which in their judgment should come out, such ties to be marked with a cross on the top face and laid aside for examination by the inspectors.

14. Inspection of ties by an independent inspector should not relieve the roadmasters, supervisors or foremen of the responsibility for the safety of their track.

15. Inspectors will inspect all switch ties in accordance with the above, except that in case a switch or cross-over set is more than one-half decayed, requiring renewals, a new set should be put in and any old ties taken out which are fit for use are to be saved and used for patching other sets.

16. After all tracks have been gone over and inspected, inspectors should spend their time checking renewals and marking ties which were missed by the first inspection. They should also carefully examine all ties taken out by foremen which were not marked originally and should see that all usable ties taken out of the track from any cause whatever are properly sorted and re-distributed for side-track renewals. Inspectors should give careful attention to all features of track work as they go over the line, especially in connection with tie renewals, and report promptly to their superior officer any defective practice coming to their attention, such as striking picks and other tools into new ties when drawing them into track, also adzing, spiking, tie-planting, etc.

DISCUSSION

D. O'Hern, Elgin, Joliet & Eastern, thought no further inspection was required than that given by roadmasters and foremen. He cited cases of incompetent inspectors that had been brought to his attention. Similar views were expressed by several others. J. B. Oatman said the track officers on his road were glad to have tie inspectors as these men saved them much time. The inspectors devote their entire time to this work, while the supervisors cannot give the necessary time and young foremen are frequently incompetent. J. F. Meir, New York, Ontario & Western, bore out this last point saying foremen would put in ties where it was easy or where little trucking was required. M. Donahue, Baltimore & Ohio, said it was his experience that roadmasters were glad to have the inspection done for them. He objected to the plan to inspect one mile of each section only on account of the time lost in riding to the next section. J. B. Kelley, Soo Line, favored inspectors as he believed the old system leads to much waste. Several others favored tie inspectors if under the direction of the roadmaster, while some preferred to have assistant roadmasters or shorter districts to permit the roadmaster to make the inspection. The report was adopted with minor revisions.

THE MATERIAL PROBLEM

By W. A. Summerhays,

Assistant Purchasing Agent, Illinois Central, Chicago.

The railroads are finding great difficulty, not only in maintaining their customary stocks of material, but in obtaining enough of the most necessary items to keep the road and equipment in safe operating condition. While deliveries have been greatly delayed, prices have climbed steadily. Track spikes that could be bought for \$3 a keg two years ago are now selling at \$8 a keg. During the same period track bolts have advanced from \$3.75 to \$11 a keg, angle bars from \$1.50 to \$3.25 a hundred weight, tie plates from \$36 to \$65 a ton, rail anchors from 16 cents to 31 cents each, steel rails from \$30 to \$40 a ton and other items proportionately. A very conservative estimate of the increases in prices of all items of material used in main-

tenance of way and structures places the figure at 30 per cent.

We have in our store departments complete records of each item of material in stock at the storehouses in addition to the quantities which are due on unfilled orders. On most railroads, however, it is the practice to carry small emergency stocks of track materials at designated points along the line as well as regular working stocks at each section foreman's toolhouse. In these times it becomes very necessary for each roadmaster and storekeeper to know exactly what is available at every point on the railroad. This is best accomplished by having for each division, whether in the office of division storekeeper or roadmaster, a complete tabulated list of every item of material on the division, showing its exact location. This statement should be kept up to date by adding each shipment of material received from the storehouse or supply car and deducting each item of material reported as used by the foremen. When emergencies arise requiring the immediate use of materials which can not be obtained readily through the customary sources, a record of this sort, showing the material on hand on the line of road is invaluable. The amount involved is no small matter, amounting to \$10,000 or more on any average operating division, and to \$20,000 or \$25,000 on the larger, busier railroads where rail, cross-tie and tie plate renewals are more frequent.

It is a natural tendency in maintaining line stocks of material to keep on hand more than the working conditions on the division justify. A record such as above described will show at a glance just how long each item has been on hand and whether it should be transferred to some other point where needed. No requisition should be passed to the purchasing agent until it has been checked carefully against the record of line stock as well as of storehouse stock and an effort made to supply the items needed from stock on hand.

Much of the material carried in line stock as a safeguard against possible emergencies remains on hand a long time before it is used. Unless given an occasional coating of heavy oil or thin paint the material soon becomes damaged by rust or action of the elements until it is little better than second-hand material.

It is extremely important to watch constantly the uses to which materials are put. Every dollar wasted in material means the expenditure of \$1.50 or \$2 to purchase the same quantity in replacement and nothing should be discarded until it is actually worn out.

While the prices of new material have advanced 30 per cent to 200 per cent, the price of scrap has risen to an even greater extent, and this has given rise on many railroads to a campaign toward cleaning up all scrap and putting it on the market. While it is desirable at all times to market all scrap as soon as it is available without permitting any accumulations, great care must be exercised to avoid selling as scrap a single item which can be put to further use. Even though the price of scrap is 300 or 400 per cent higher than at the start of the war, we must remember that the spread between scrap material and new material is much greater now than at that time.

Although all section foremen may be fully instructed relative to carefully inspecting scrap before loading for the market and holding out every usable article, it is a very human tendency to discard with the scrap all second-hand material of which the foreman has no immediate need. It, therefore, becomes necessary to have a competent inspector pass upon all scrap and set aside all material which is fit for further use or can be reworked. Where facilities are provided for reworking and assorting scrap at one point on a division or railroad system, a very decided saving can be effected by employing a blacksmith to rework certain materials.

All roadmasters are familiar with conditions in the rolling mills, due to giving preference to the government's requirements for new rail, the result being a decided shortage in new rails on many railroads. This condition has strongly affected the supply of frogs, switches and guard rails owing to inability of the frog manufacturers to procure new rail. Every roadmaster can help this situation by making careful inspection of every piece of track material removed from track. Many spring frogs and bolted rigid frogs can be made fit for further use, when removed from track because of having only one part broken, by removing a similar part from another scrap frog and making repairs. A great deal of this kind of work is being accomplished on various railroads, some railroads going to the expense of fitting up small shops where second-hand rail can be planed and fitted to supply the needed parts in repairing frogs. In view of the wide spread between the cost of new material and the value of scrap material, the present is an exceptionally favorable time for installing a plant of this nature.

DISCUSSION

P. J. McAndrews, Chicago & North Western, described in detail the methods used on the North Western to repair frogs in side tracks and yards by means of the oxygen acetylene welding process. The road has 50 outfits and plans to provide each roadmaster with one. The process has not been used on the main tracks but he believed it is practicable. The outfits are leased to the railroads by a manufacturer who sells the gases and metal used in welding, and also furnishes an instructor to teach the process. Bright young men taken from section gangs learn to do the work very quickly. The torches are also used for cutting rails and burning bolt holes as accurately as necessary for side track work. Old angle bars have been welded to part of the rail for rail anchors when new anchors could not be obtained.

THE ECONOMY OF OILING TRACK FASTENINGS

By E. T. Howson

Engineering Editor, the *Railway Age Gazette*

To have suggested that track fastenings should be oiled to protect them from corrosion would have subjected one to much ridicule only a few years ago. Yet today not one, but several large roads have made this a standard practice and others are awakening rapidly to the economy of this procedure, so that it is now a subject of live interest to track men.

THE DESTRUCTIVE EFFECTS OF CORROSION

The destructive agents attacking track materials may be divided into two general groups, (1) those resulting from wear created by service and (2) those resulting from atmospheric and other agencies producing corrosion. It is with the latter group that we are interested here. Corrosion is induced primarily by (1) the action of the atmosphere, (2) the action of salt water or spray on lines located along the seacoast, (3) by local conditions at tunnels, etc., and (4) by brine drippings from refrigerator cars.

Atmospheric corrosion is present everywhere, although in widely varying degree of activity. Its effects are most pronounced in humid climates, as in certain parts of the south, while its action is almost negligible in parts of the arid west. The most severe corrosion exists on those railroads over which large numbers of refrigerator cars are hauled.

The first effect of corrosion is a loss of material. This may be so small relative to the total area of the section as to be negligible, but with track fastenings this deterioration frequently continues to the extent that failure is brought about from weakness due to loss of section. One of the most severe examples of brine corrosion in this country is found on the tracks of the Chicago Junction Railway in

the Union Stock Yards, Chicago. On one of the main switching leads over which refrigerator cars are moving almost constantly the base of the rails, the tie plates and the fastenings are eaten away so quickly that they have to be renewed at intervals of not to exceed one year. This condition is more severe than that found on the average road. However, severe conditions are found frequently on lines out in the open. They are brought about primarily by the brine, but the atmospheric corrosion tends to the same result.

Another common and serious result of corrosion is the rusting of the nuts in place on track bolts. This condition prevents their being tightened readily, as they should be from time to time, and causes a heavy breakage and consequent loss of bolts when they are tightened. When relaying rail, the presence of corroded bolts not only slows down operations through the necessity of cutting them off, but this operation in itself is expensive.

APPLYING OIL ARRESTS CORROSION

The realization of the losses in track materials brought about by corrosion has led to the experimental application of oil on a number of roads during the last few years. To be effective in arresting corrosion, it is important that the proper grade of oil be selected. It must not be so thin that it will not remain on the fastenings, but will run off freely onto the ties and ballast, while it should not be so thick that it will not distribute itself over the metal readily. Where the proper grade of oil is secured it has been found possible to retain this coating on the fastenings for a year or more.

When experimenting in a limited way it has been the common practice to apply the oil by hand, giving a track walker or section man a bucket of oil and a small broom, brush or swab. This was the method used by the Chicago & North Western in oiling the joints on six miles of track in which new rail was being laid last year. Ordinarily crude oil was used for this work at a cost of about \$4 per single-track mile, 50 cents of which was for material and \$3.50 for labor.

The Union Pacific oiled the joints in one mile of track in each roadmaster's district on the Wyoming district last fall. The bolts were not tightened for two or three days after the oil had been applied, but after that interval it was found that they were tightened more easily and that the threads on the bolts and nuts were maintained in better condition, thereby securing a saving in both labor and material. To secure a direct comparison of results a number of joints which had been oiled and a similar number which had not been so treated were removed recently for examination, and it was found that while the bolts which had not been oiled showed evidence of corrosion and cutting of the threads, the others showed no such tendency.

The Chicago, Burlington & Quincy adopted the practice a year ago of oiling all the joints and bolts when laying new rail or when relaying second-hand 85-lb. rail or heavier on main lines. Bolts in main tracks which are to be relaid are also oiled about a month in advance of the removal of the rail and this practice has been found to permit a much larger percentage of the bolts to be reclaimed. Recent studies of this subject have also led to the decision to oil not only the joints, but also the base of the rail and other fastenings on certain lines of this road.

A little over two years ago the Illinois Central began to experiment with the oiling of track fastening on its Southern lines, the results of which have been so satisfactory that it has been extended over the entire system and all joints are now oiled twice a year. The oil is ordinarily applied by hand with an ordinary whitewash or paint brush. Approximately 10 gal. of low-grade fuel oil is required per mile. The total cost of this application

varies from \$2.50 to \$4.25 per mile, averaging somewhat over \$3.

One of the earliest roads to undertake the oiling of track fastenings was the Atchison, Topeka & Santa Fe, on which road it has been found that this practice has increased the life of the bolts 25 per cent. Careful records have also shown a saving of over 30 per cent in the number of bolts required for replacement purposes on the Eastern lines, while it has been estimated that the amount of labor required to tighten loose bolts has been reduced at least 40 per cent. About 75 gal. of fuel oil, costing about 5 cents per gallon, is required per mile, making a total cost for material of \$3.75 per mile and \$2.50 for labor. Where the bolts and joints are oiled alone the total cost is approximately \$2.50 per single-track mile.

THE LACKAWANNA HAS DEVELOPED AN OILING MACHINE

The Delaware, Lackawanna & Western has developed this practice further than any other road. This line has been a pioneer in the development of heavy track construction. Creosoted ties and screw spikes are used exclusively, while the tie plates are of a heavier section than commonly employed elsewhere. With treated ties costing \$1.30 each, tie plates between 30 cents and 50 cents, screw spikes 5 cents and track bolts from 5 to 11 cents each, and other track materials correspondingly expensive, this road began an investigation of means of protecting these materials early, which led to the oiling of track fastenings. Further study led to the development of a track-spraying device in 1914. The following year a flat car was equipped to distribute the oil and in 1916 an enclosed air-operated car was built in a remodeled caboose. One end was rebuilt to bring the operating table as far forward as possible and the car was equipped with air compressors, air supply tanks, sand boxes, rail wiper, oil strainer, air-operated oiling devices, an automatic device for clearing obstructions on the track and adjustable circular nozzles. The car was also equipped with a headlight, whistle, air brakes, speedometer and pressure gages, enabling the operator to control the train and to know the conditions under which he was working at all times.

Approximately 1,100 miles of track was oiled with this machine in the fall of 1916 at a cost of \$5.60 per mile, divided as follows:

10,400 gallons of oil at 5 cents.....	\$520
Engine and crew.....	30
Operator	5
Materials and supplies.....	5
Total cost per day.....	\$560

When the oil was first applied, in 1915, it was expected that it would loosen and remove the scale and corrosion on the rails and fastenings and a heavy application was made where corrosion from brine drippings or other causes was severe, the ordinary application being about 100 gal. per mile. The following year it was found that the oil had removed the heavy scale and exposed the solid metal where the corrosion had been severe and at other places subjected to ordinary attacks the oil was in first-class condition on the fastenings. After making a further application last year it is evident that this oil is now protecting the rails and fastenings satisfactorily. With the dust created by traffic it has formed a coat on the metal that is not affected by weather conditions. Based upon this experience, it is believed that a heavy coating of oil after the original application may be followed by lighter applications once a year where track is not subjected to excessively severe corrosion.

The practice of oiling track fastenings to protect them against corrosion has now been developed satisfactorily to demonstrate the fact that oil of the proper grade will protect the rails and fastenings from corrosion and thereby

extend their life materially. The economy of the oiling of the fastenings would appear to require no demonstration, particularly at the present time, when these materials are obtainable only with great difficulty and long delays.

DISCUSSION

C. H. Gruver, Chicago, Rock Island & Pacific, stated that on his road all joints were oiled twice a year and he finds the practice successful. It is done with a pail and brush and costs \$12 per section. J. H. Brown, Atchison, Topeka & Santa Fe, told of six years' experience with oil and stated that it was entirely successful. It eliminates rust and makes wrenching easy. Cattle guards are also oiled, thus greatly increasing their life.

LABOR SAVING EQUIPMENT FOR TRACK WORK

By E. J. Boland

Roadmaster, Illinois Central, Freeport, Ill.

It is the intention here to give an idea of the labor-saving devices in use on one of the large railroad systems of this country. There are two reasons for the installation of this large amount of the equipment mentioned below. (1) as a matter of progress, and (2) to offset the growing scarcity of all classes of labor.

Ditchers. The steam ditcher is one of the greatest labor savers in operation today. The company now has nine ditchers of the boom type. The saving with the operation of these machines is estimated at 10 cents per yard on 250 yd. per day over the next best method. Six months' operation per year will save about 50 per cent on the investment. In addition to operating as ditchers, these machines can be used in loading and unloading all kinds of materials, for other heavy lifting and for excavating work.

Dump Cars. Air dump cars in place of flat cars in ditcher service are of great value. The method is to operate two 20-yd. air dump cars with each ditcher, one ahead of the machine and one behind. By this method the cars are easily loaded and can be unloaded immediately. My experience has been that a saving of four cents per cubic yard can be made, based on 125 cu. yd. per day, which figures about 22 per cent on the investment, based on six months' operation per year. This also releases the 10 or 12 steel underframe flat cars for revenue service and the Lidgerwood for heavier work in unloading gravel ballast.

Lidgerwood Unloaders. The company now has 11 of these machines which are used in unloading gravel ballast, sand for track elevation, dirt, strippings for banking and any similar heavy work which is found necessary. A trainload of gravel from the Foreston, Ill., pit consisting of 35 Haskell & Barker cars of about 30 yd. each can be unloaded with one of these machines in about 30 min. provided the material is unloaded continuously. This operation would require 210 men for about 2½ hours without this equipment. These machines, when operated six months of the year, will save at least 50 per cent on the investment.

Track Supervisors' Motor Cars. The company has provided each roadmaster and track supervisor with an inspection car, which has increased the efficiency of these officers over 100 per cent. The track can be given much closer attention than by any other method.

Section Motor Cars. Until recently the company had only a few sections equipped with cars of company ownership. A great number of the men had realized the advantages that could be obtained from motor cars and had purchased engines themselves from various makers which were installed on their hand cars. The road has now purchased a sufficient number of cars to equip all of the gangs. Arrangements were also made to purchase the engines from the foremen, so that the company would be the sole owner of all of the motor-car equipment on its lines.

Bridge, Building and Extra Gang Motor Cars. The additional advantage obtained in this class of work is that the gangs often travel long distances. The men are carried to their work with the greatest despatch and are not worn out by the trip. It is not necessary to move the camp outfits nearly so often, which saves car mileage and switching.

Motor-Car Mowing Machines. After trying out a machine of this character for two years it was found so desirable that 13 more were purchased. These cars will mow a neat swath on each side of the track at the rate of about 30 miles per day. Each machine will save its cost every year.

Tracklaying Machines. The nine tracklaying machines which are now operated by the company have been of great service in offsetting the labor situation. They are a great relief to the men, as the machine does all of the heavy lifting. The gangs can be reduced or more rail laid than was possible with the same gang prior to operating the machine. The ordinary new rail program on this road includes between 50,000 and 60,000 tons per year and any reduction in the cost of laying this rail cuts down one of the largest items of expense.

Rail Loaders. Each division is now equipped with an approved air rail loader which can be operated with three or four men, whereas this work formerly required about 20. A saving of this kind is an absolute elimination of all of the useless work which was formerly done by hand.

Tool Grinders. This device relieved the most cumbersome tool that was carried on the hand or motor car. Grinders cost from \$12 to \$25, depending on the number of attachments provided with the machine. Tools can be kept in better shape and the machine saves its first cost in one season.

Weed Burners. These are of great value in the heavy semi-tropical country. These machines when operated over a district a second time, destroy all growth for a width of 18 ft. for an entire season. The labor of operating is almost nothing, compared with hand work in the same locality.

Rail Saws. The company is now operating one portable rail saw at Clinton, Ill., and authority has been granted for an elaborate permanent sawing plant to be located at Centuria. All second-hand No. 1 rail of the 85- and 90-lb. class is sawed and re-drilled before relaying in branch-line main track. The sawing process makes infinitely better riding track and adds greatly to the life of second-hand rail. It is figured that about \$2 per ton will take care of all of the expense of handling and sawing. The riding of track has improved 100 per cent by using sawed rail, in comparison with the old method.

Snow-Thawing Outfits. The greatest advantage in these outfits is that it is not necessary to reload snow and ice taken from switches and interlocking plants. In congested territory it was formerly necessary to cast snow out of the switches and in some cases it would have to be handled five or six times before it was finally disposed of. One man with one of these outfits can accomplish as much as three or four by the old method.

Cinder Cars. Each terminal should have a sufficient number of cinder cars to take care of all of the cinders handled without using cars in revenue service. The side dump car with the ridge bottom is the best class of car in service. It is proposed, however, to make these cars large enough to hold 50 tons of cinders, which would cut down the number of cars and greatly aid in the distribution.

There are many other small devices which are of great advantage to the trackman, some of which are—

- Lawn movers,
- Switch-point straighteners,
- Portable electric timber drills,
- Oxweld repair outfits,

- Ballast screening outfits,
- Rail benders,
- Snow plows and flangers,
- Electric trucks (for service in shipyards and docks),
- Cleaners for bridge steel (no satisfactory device is on the market at the present time, but a device for cleaning bridge steel preparatory to painting would be a labor- and money-saving device).

- Tie sizing and boring machines,
- Acid grass and weed killers (several of these patent weed killers have been tried out on this system, but the results obtained have not been satisfactory enough for the expense incurred to justify their use). I think that every device of this kind should be given fair trial, as the labor to remove weeds and grass by hand is tremendous.

INSPECTION OF RAILS AT THE MILL

By C. W. Gennert, Jr.,

Manager, Rail Inspection Department, Robert W. Hunt & Co., Chicago.

It is said that the earliest inspection of rails consisted chiefly of determining whether the size of the flaws in the flanges of the iron rails would permit of their concealment by dovetailing into them a piece of iron and afterward rubbing the patch with a mixture of scale and white lead. Later at the commencement of manufacturing Bessemer steel rails, which railroad officers were reluctant to adopt on account of their supposed brittleness, inspection became a more serious matter. Somewhat stringent specifications were required to be followed, and eventually chemists were employed to analyze the steel made. The new order of things came to stay, and manufacturers, as well as railroad officers, were brought to a keen realization of the fact that with so important a subject as rails, their careful and systematic inspection was not only warranted, but positively necessary.

STARTED IN 1912

It seems remarkable that for years the inspection consisted, apart from chemical and physical testing of the steel used, of merely examining the exterior or surface of the rails rolled; that is, (1) of insuring the proper fit of the template or gages; (2) of guarding against the shipment of rails containing flaws, seams and similar defects that can be seen on the surface, and (3) of assuring adherence to the desired mechanical finish of the rails with regard especially to the lengths, squareness of the ends, drilling of the bolt holes, etc. The idea never seemed to occur that steelmaking and the subsequent treatment that steel receives from the time it is made until it is finally rolled into rails is subject to all of the frailties to which either the misworking of the process or error of the human agency may contribute. But in 1912, when a very severe winter's record of rail failures had brought this subject to foremost attention, it was deemed advisable, by certain railroads, to inaugurate a system of greater or closer rail inspection. It is a system of inspection now recognized as essential by over 60 per cent of the railroad mileage of the United States and Canada.

Two important facts in connection with the manufacture of rails must be remembered; first, that all of the work is continuous for 24 hours a day and 6 days a week; and second, that the workmen are invariably paid on a tonnage basis, say, for 100 tons, with a bonus when this amount is exceeded in a stated time. Both of these conditions are almost a positive essential to the industry, as obviously and under most circumstances an increase of production must be invited from the men. But no other conditions possible could probably introduce the liability for error, or the exercise of poor judgment that might result in bad quality that these do, for the temptation among the workmen to

"speed up" some part of the process unnecessarily becomes quite irresistible at times and possibly to the detriment of the quality of the rails being made.

Special inspection provides a safeguard for the evils associated with the process of making rails. The system contemplates the employment of inspectors for duty day and night in each important department of the mill. These inspectors, employed in so far as possible because of their experience with the work of the department to which they are assigned, act as monitors in that department. Each man keeps an individual record of the work of his department, so made up that it is actually a historical record of each heat of steel made and the treatment it later receives in the rolling process. The men are instructed not to interfere with the operation of the mills in any way except by appealing to the moral responsibilities and obligations of those in charge. This they do by first reporting verbally to the foreman in charge of the work in each department any deviation from recognized good practice, and then by confirming that report in writing to the higher officers in charge. Immediate opportunity is therefore afforded the manufacturer to divert the metal affected by bad practice or workmanship to other uses or orders, and to take such action as will prevent shipment of the rails which might otherwise go forward. This feature alone has resulted in the greatest check imaginable on errors of mill practice and lack of judgment due to the employment of workmen on the tonnage basis. The workmen apparently realize that an inspector is watching every move with the interest of the final purchaser of the rails so much at heart that any evident carelessness or lack of good judgment may be promptly reported to the officers and consequent disciplining result. And this also has been the principal feature of special inspection that has so largely appealed to the officers of the manufacturing companies, for they, unquestionably desiring to make and ship only rails of the best quality and workmanship possible, have been quick to appreciate the advantage gained.

The reports of the special inspectors are accumulated eventually and made up to comprise a complete record of each heat rolled and this is furnished to the purchaser as desired. A splendid opportunity is thus afforded for keeping definite record of the data concerning the manufacture of each heat of rails and the later serviceability of those rails; in fact, a plan has been advanced whereby the linking together of the manufacturing record with the failed rail records might afford untold benefits in the solving of the ultimate problem of what constitutes good rails, but unfortunately this plan has not yet been taken advantage of except in isolated cases.

There is one remaining feature connected with the manufacture and inspection of rails which it seems not only fair to mention, but to impress you with it to the fullest extent. It is this: The best steel rails possible of making and the closest and most critical inspection will be of no avail whatsoever unless the rails are properly used by the railroads. You appreciate fully that the slightest nick in the right place can ruin the best of steel and its misuse in other ways frequently proves equally injurious.

OTHER PAPERS

C. J. Coon, engineer of track, Grand Central Terminal, New York, read a paper Wednesday morning on maintenance of track in large terminals in which he discussed track construction and maintenance methods applicable to intensive operation under adverse conditions.

J. S. Robinson, division engineer, Chicago & North Western, Chicago, read a paper on housing and feeding maintenance employees in which he described a design of portable frame house which could be built economically and also be dismantled readily and moved from place to place.

Coleman King, Long Island, presented a paper at the Tuesday evening session describing in detail the work involved in assembling materials and building tracks at the cantonments on Long Island.

The annual dinner of the Track Supply Association was held at the Auditorium Hotel Wednesday evening. There were 300 members and guests present. M. J. Gormley, assistant to the president, Chicago & North Western, and chief general agent of the central district of the American Railway Association at Chicago, spoke on the transportation problems incident to the war.

The report of the secretary showed 102 new members and a total membership of 964. The treasurer reported over \$1,300 in the treasury. The total registration of members at the convention was over 250.

On Thursday afternoon the party visited the Gary mill of the Illinois Steel Company, studying the manufacture of rails.

THE TRACK SUPPLY ASSOCIATION

The sixth annual exhibit of the Track Supply Association was held in a room adjoining the convention hall. About 50 firms exhibited their devices. Most of these had exhibited before, but there were also several new ones. The officers of the association for the past year were: President, R. A. Van Houten, Sellers Manufacturing Co., Chicago; vice-president, E. T. Howson, *Railway Age Gazette*, Chicago; secretary-treasurer, W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y.; past-president, F. A. Preston, The P. & M. Company, Chicago; director, J. J. Cozzens, Union Switch & Signal Company, New York, N. Y.; director, F. A. Barbey, Frictionless Rail, Boston, Mass. The names of the exhibitors, together with the products exhibited and the names of representatives in attendance follows:

Ajax Rail Anchor Co., Chicago. Rail anchors. H. G. Elfhorg, G. N. Holmberg, A. W. Holmberg.
American Hoist & Derrick Co., St. Paul, Minn. American railway ditcher. Edward Coleman, H. O. Washburn.
American Steel & Wire Co., Chicago. American steel fence posts. American fence. M. E. Evans, A. W. Froude, J. Alexander, L. P. Shanahan, J. L. Collins, C. Boone, B. Ryder.
American Valve & Meter Co., Cincinnati, Ohio. Economy switch stand, Anderson interlocker switch stand, Safety switch lock. J. T. McGarry, F. C. Anderson.
Anti-Creeper Corporation, New York. Rail anchors. O. Metcalf, C. H. Genscher, T. J. B. Bowman, E. L. Mills, P. B. Brown, A. J. Dinklage, E. T. Evans.
Barrett Co., New York. Tarvia, Barrett's shingle stain, Corbosa grade one liquid cresote oil, semaphore roofing, Multi-shingles, Everjet paint. E. J. Caldwell, J. E. McVay, John Ross, H. W. Fleming, Tom A. Warton, K. C. Barby, C. F. Ames.
Bethlehem Steel Co., South Bethlehem, Pa. New Century adjustable switch stand and "Steelton" positive switch stand. Robert E. Belknap, Neil E. Salsich, John F. Hennessy.
Carbic Mfg. Co., Duluth, Minn. Carbic lights. Gordon Paterson, H. N. Haberstroh.
Chicago Malleable Castings Co., Chicago. Thomas rail anchor tie plate. J. S. Llewellyn, W. M. Osborn, Ralph Schmidt.
Greer, Adams & Co., Chicago. Calumet track drill, Ureka bonding drill, Carbic lights, track jacks, journal jacks, car jacks and Calumet die starters. Russell Wallace, W. I. Clock, George Bassett, J. A. Martin, C. Clifford, C. Gregory, R. Bullard.
Duff Mfg. Co., Pittsburgh, Pa. Genuine Barrett track jacks, Duff standard and high speed ball bearings, screw jacks and journal jacks. C. M. Thulin, E. J. Johnson.
Fairbanks, Morse & Co., Chicago. No. 36 one-man inspection motor car. A. A. Taylor, E. C. Golladay, D. K. Lee, G. W. Lewis.
Fairmont Gas Engine & Railway Motor Car Co., Fairmont, Minn. Motor cars. D. G. Shephard.
The Frictionless Rail, Boston. Special section of rail for track curves. F. A. Barney, B. W. Simmonds, T. F. Dwyer, Jr.
Hauck Manufacturing Company, Brooklyn, N. Y. Thawing outfits, kerosene burning torches. G. A. Nelson, W. M. Squires, C. P. Cogswell.
Hayes Track Appliance Co., Richmond, Ind. Hayes derails. S. W. Hayes, R. W. Slantherhack.
R. W. Hunt & Co., engineers, Chicago. Inspection of materials. C. W. Gennet, Jr., J. J. Clark.
Indianapolis Brush & Broom Co., Indianapolis, Ind. Track brooms. F. R. Lay, George Lemaux.
Indianapolis Switch & Frog Co., Springfield, Ohio. Electric welder and manganese track worker. J. C. Jameson.
Ingersoll Rand Co., New York. Pneumatic tools and tie tampers. W. H. Armstrong, W. J. Warner, C. Dougherty.
Luckawanna Steel Co., Buffalo, N. Y. Hook shoulder tie plates, grooved head angle bars, Abbott rail joint plate, welded high T-rail joint. A. P. Van Schick, J. Hench, F. E. Abbott, A. H. Weston.
Alexander Milburn & Co., Baltimore, Md. Mithril carbide light and oxy-acetylene welding and cutting apparatus. E. C. McNutt.

Madden Company, Chicago. That labor saving devices. H. C. Holloway, T. D. Crowley.

Mudge & Co., Chicago. Motor cars. R. G. Sinclair, F. Posson, George W. Bender.

National Lock Washer Co., Newark, N. J. Nut locks. J. Howard Horn, R. L. Carneros, John T. Patterson, Alvin T. Thompson.

National Malleable Castings Company, Cleveland, Ohio. Rail anchors, rail braces and tie plates. J. J. Byers and T. W. Aishon.

Oxwell Railroad Service Company, Chicago. Welding by its oxygen and acetylene system. George Thompson, E. A. Woodworth, L. C. Ryan.

P. & M. Co., Chicago. P. & M. Vaughn and Ilenghi rail anchors. F. A. Preston, John Reagan, L. O. Henzgi, John E. Mahoney, S. M. Clancy, Alvar R. Sutter, P. E. Samelson.

Pocket List of Railroad Officials, New York. C. L. Dinsmore, J. Alexander Brown.

Q. & C. Co., New York. Rail clamps, derails, rail and step joints. J. L. Terry, R. B. Quincy, C. M. Brennan, A. R. Horn, A. Robertson.

Rail Joint Co., New York. Webber, Continuous, Troy, plain, insulated and step joints. B. Armstrong, G. H. Larson, A. C. Chapman, E. F. Schermerhorn, W. S. Boyce, G. T. Willard, I. N. Towne, H. C. Hickey, C. B. Griffin, J. P. Norton, Charles Jenkinson.

Railroad Supply Co., Chicago. Tie plate. H. H. Smith, H. C. Van Nostrand.

Railway Review. W. M. Camp, Elmer Gougeon, H. A. Smith.

Ramapo Iron Works, Hillburn, N. Y. Solid-rolled double-shoulder switch plates, Automatic safety switch stand. W. C. Kidd, Arthur Genander, Thomas E. Alers, Douglas E. Snow.

Reading Specialties Co., Reading, Pa. Rail bender, guard rail clamp, Compromise joint car replacer and fastener, tie spacer and Reversible rail bender. B. John Buell, J. J. O'Connell.

Henry Roos Foundry Co., Chicago. Hardieck locked and covered turnbuckle, Boltless Head Rod. William Hardieck, L. A. Ogden.

Sellers Mfg. Co., Chicago. Tie plates. J. M. Sellers, R. A. Van Houten, G. M. Hogan.

Simmons-Beardman Publishing Co., New York and Chicago. E. T. Howson, W. S. Lacher, J. H. Cross, H. A. Beardsley, J. H. Bryan.

Simple Gas Engine Co., Menasha, Wis. Gas engines. John P. Hrubesky, F. J. Oberweiser and John G. Walter.

Southern Railway Supply & Equipment Co., St. Louis, Mo. Saunders car stoker. W. D. Achuff, L. Boswell.

Templeton-Kenly & Co., Ltd., Chicago. Simplex jacks. A. C. Mills, J. H. Hummel, W. B. Templeton.

Track Specialties Co., New York. Superior mechanically operated derailler, Superior hand operated derailler, Trasco guard rail clamp, Superior compromise rail joint, Superior rail bender, Superior rail joint, Trasco guard rail brace, Trasco tie plate, Trasco padded tie plate, Trasco rail brace, Trasco foot guard, Trasco slide plate and brace. J. H. Bodkin.

Union Switch & Signal Co., Swissvale, Pa. Keystone insulated rail joint. J. Roett, J. J. Cozzens.

Vernon Tool Works, Pittsburgh, Pa. Track tools, gages, levels. H. C. Muil, E. Woodings, H. Fischer.

Walls Frogless Switch & Mfg. Co., Kansas City, Mo. Electric operated frogless switch. C. E. Ennis, C. M. Walker.

Wyoming Shovel Works, Wyoming, Pa. Chrome nickel steel, heat treated track shovels. H. T. Potter, G. E. Geer, H. C. Emery.

At the annual election of the Track Supply Association held Wednesday morning, the following officers were selected: President, E. T. Howsen, *Railway Age Gazette*, Chicago; vice-president, J. J. Cozzens, Union Switch & Signal Company, New York; secretary-treasurer, W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y.; directors, F. A. Darbey, Frictionless Rail Company, Boston; E. Coleman, American Hoist & Derrick Company, St. Paul, Minn.

PROGRESS OF THE ERECTION OF THE QUEBEC BRIDGE

QUEBEC, September 19, 1917.

With favorable weather conditions obtaining it now seems assured that the work of hoisting the central span of the Quebec bridge to its final elevation, one hundred and fifty feet above the level of the St. Lawrence river, will be completed before sun-down Thursday, September 20. The hoisting was begun on Monday, September 17, and at quitting time, 6 p. m. Wednesday, the span had been raised through one hundred and twenty feet of elevation, leaving only thirty feet to be negotiated before it reaches its final level.

The preliminary work having been completed previously it was intended originally to float the span to place on Saturday, September 15, but because of the unfavorable weather conditions action was deferred till Monday.

On Sunday night the conditions were considered favorable and the valves controlling the flow of the water in and out of the scows on which the span had been supported for some time were closed after the lowering tide had completely drained the scows of water; and with the rising tide of Monday morning the scows floated clear of their specially pre-

pared foundations and the three-mile towing trip to the site of the bridge was begun. The trip from the erection site to the site of the bridge consumed about two hours. Arriving at the bridge site the span was made fast and held in its proper position under the cantilever arms of the main structure by means of cables. The hanger lifting chains by which the span was raised were then attached to the supporting girders and the hoisting operations were begun shortly after 10 o'clock.

The hoisting is being done by eight hydraulic jacks placed two at each corner of the span and for each cycle of the jacks the lift is two feet. The work on Monday, which consisted of twelve lifts or twenty-four feet of elevation, was accomplished without a hitch.

On Tuesday when twenty-two lifts were made the work was held up for three hours in the early afternoon by the breaking of a bracket used in connection with the removal of the raised links of the hoisting chains. While this accident was minor it was necessary to hold up the work while a new bracket was made and installed.

On Wednesday before commencing the hoisting operations the brackets around all the chains were reinforced but in spite of this delay twenty-six lifts were made during the day.

RAILWAY SIGNAL ASSOCIATION

The Railway Signal Association held its twenty-second annual meeting at Atlantic City, N. J., on September 18 and 19, with about 100 members in attendance and President C. A. Dunham (G. N.), in the chair. The president, in his opening address referred to the stress of war conditions as affecting the signal departments of the railways and urged adherence to high standards in spite of the varied difficulties. Numbers of members have joined the army or the navy and the speaker uttered a patriotic Godspeed to them. The association looks forward to their safe return and keeps their names on the rolls of membership with all dues suspended. The work of the committees was commended and a warm tribute paid to the excellence of the work of the former committee which framed the present constitution of the association.

Secretary C. C. Rosenberg reported a membership on August 31 of 1,281, a net increase in 12 months of 13. He is unable to learn the names of all who have entered the military service and requests all interested to advise him of all such names. The 1,281 members include 703 senior, 226 junior and 344 associate, and representative votes (\$01) are cast by 70 railroads, operating about 173,000 miles of road and 186,000 signal blades. Receipts of the association for the year were: Balance, \$2,453; dues, \$3,469; sales of literature, \$3,536; miscellaneous, \$3,730; total, \$13,188. Expenses, printing, journal, etc., \$4,409; running expenses, \$5,774; balance, \$3,005.

The first report was that of the Harmonizing Committee, H. S. Balliet (N. Y. C.), chairman. This committee has reviewed all specifications adopted up to 1917 and all recent action taken by the association and submitted reports on 20 subjects. Some of these reports had not been concurred in by the committees most interested and there was a long discussion on the true functions of a harmonizing committee. The great bulk of the work of the committee was accepted, but the meeting buckled down to about three hours of committee work and directed that a number of subjects be referred back to the primary committees, mainly Committee No. 2, Mechanical Interlocking and No. 6, Standards.

Committee No. 3, F. B. Wiegand (N. Y. C.), chairman, presented a revised specification for petroleum asphaltum for protecting insulated wire in trunking, which after some amplification was adopted to be referred to letter ballot.

Committee No. 2, C. J. Kelloway (A. C. L.), chairman, presented a report on Field Construction of Pipe Lines, which

after brief discussion was accepted and ordered sent to letter ballot. A report by the same committee on Locking Switches Mechanically at Interlocking Plants was discussed at considerable length, the question whether the lugs for No. 1 switch rods should or should not have slotted holes developing decided differences of opinion. With first class road bed and large rails they are not used; but many members declared them a necessity. After a long discussion the report was accepted, not as a standard but in the nature of instructions to the Committee on Standards (Committee No. 6).

The Committee on Standards (No. 6), F. P. Patenall (B. & O.), chairman, presented eleven new designs and 15 revisions of designs, and a specification for lantern globes. These designs include the following:

Details and Assembly of Multiple Unit Bolt Lock; Mechanical Semaphore Bearing; Operating Connections for Mechanical Signals; Guide Clamps for Vertical Connections on Signals; Deflecting Bars; Cable Post Pinnacle and Cable Outlet; Relay Boxes; Cable Posts and Relay Boxes; Relay Box Inlet Bracket; Relay Box Linings and Terminal Boards; Horizontal Adjustable Deflecting Stands; Vertical Deflecting Stands, and Detector Bars. Also a revised compensation table and five pages of signal symbols, revised.

Also, two drawings, submitted for discussion only, covered an assembly of switch fittings for a double slip switch, and the same for movable point frogs. These represent designs already in satisfactory use on two roads. All of the foregoing, after some discussion, were accepted, and ordered sent to letter ballot, excluding the last two, but including the specifications for hand lantern globes. The matter concerning photometric tests of globes was criticized as incorrect in some details and was accepted subject to correction.

In line with an instruction to look into the specifications for signal roundels, lenses and glass slides, with a view to considering the high transmission convex glass, the committee made numerous field tests and visited various glass companies, with the result that it considers it advisable to adopt the high transmission, convex glass. This will give an increase in efficiency in the transmission of light. The convex roundel is to be recommended on account of its greater strength, eliminating to a certain extent the possibility of snow collecting on the face of the roundel and the absolute elimination of phantom lights. It was found that there are in use 16 different diameters in red roundels, 12 in yellow roundels, 17 in green roundels, 7 in purple roundels and 7 in blue roundels. The committee recommended the confining of new designs of apparatus requiring roundels to 3½ in. and 5½ in. in diameter for all colors.

In lenses, the committee found 9 diameters in red reported in use, 5 in purple, 6 in green, 4 in lunar white, 7 in white flint, 4 radius lenses, or a total of 40 different diameters in the various colors. The committee recommended the confining of new designs to the following in order to reduce the stock of various diameters: 4 in., 4½ in., 5 in., 5½ in., 6½ in., 8½ in., 10 in. and 10 in. doublet lens.

In the discussion on glasses the recommendations of the committee were warmly commended. It was suggested by a glass maker that the maintenance-of-way and the motive-power departments also should be brought into the movement to reduce the great variety of sizes. A. H. Rudd (Penn.), uses convex roundels of high transmission glass with great satisfaction.

Committee No. 10, R. B. Elsworth, (N. Y. C.) chairman, presented a specification for lead type stationary storage battery; general specifications for switchboards, including requisites, and a drawing of a proposed standard thermometer for storage battery. The committee brought up to date the specification for the battery now in the manual in order to harmonize the subject-matter wherever possible with specifications of similar character adopted in 1916. The switchboard specifications had been thoroughly gone over at a joint

manufacturers' meeting. The thermometer can be purchased economically in the open market.

The whole report was accepted and referred to letter ballot; but the switchboard specification was discussed at considerable length. There was a demand that all matter in the specification be written out in full instead of referring, as is done in some cases, to the specifications of the American Institute of Electrical Engineers; but this A. I. E. E. manual was said to be procurable at 25 cents a copy and the meeting sustained the present practice.

Committee No. 8 made a long report (presented by W. W. Morrison) 40 pages of which were filled with descriptions of alternating current signaling on 15 roads (including several electrically operated lines) as follows: The Philadelphia & Reading, the Cleveland, Southwestern & Columbus, the Norfolk & Western, the Boston Elevated, the New York, New Haven & Hartford, the Chicago, Milwaukee & St. Paul, the Chicago, Rock Island & Pacific, the Oakland, Antioch & Eastern, the San Francisco-Oakland Terminal, the Montreal & Southern Counties, the Atchison, Topeka & Santa Fe, the Lehigh Coal & Navigation Company, the Scranton & Binghamton, the Cumberland Valley and the Cincinnati, New Orleans & Texas Pacific.

The specifications cover impedance bonds, electric alternators, reactors, resistors, single-phase line transformers and other details. All were accepted and ordered to letter ballot, except the "general clauses to be used in unit specifications" (page 488, September Journal) which were referred back to the committee.

Committee No. 7, E. G. Stradling (C. I. & L.) chairman, reported on a proposed standard 2-ohm track relay, having made a study of resistances which has been discussed at previous meetings; but, after considerable discussion and much objection to displacing 4-ohm relays without further study of conditions on railroads in all parts of the country, the report was referred back.

The Committee on Electrical Testing, P. M. Gault (Ill. Cent.) chairman, recommended the adoption of the data published last March on Ranges and Scales for Electrical Instruments, and a form for recording results of tests. Both were accepted after brief discussion, and referred to letter ballot.

The report of Committee No. 5, presented by L. R. Mann, (Mo. Pac.) vice chairman, included a revised code of instructions for maintenance of alkaline storage batteries, which was accepted without discussion and ordered referred to letter ballot.

The special committee on Lightning Protection, E. G. Hawkins (N. Y. C.) chairman, presented a revised specification for ground apparatus for lightning arresters which, after brief discussion and one or two slight alterations, was accepted and ordered to letter ballot.

The Board of Direction reported that a committee had proposed three cities, Chicago, St. Paul and Cleveland, one of which should be selected as the place for the next annual meeting; but it recommended that, because of war conditions, no selection be made at this time; and the meeting left in the hands of the board all questions concerning next year's meetings (March, June and September).

The election of officers of the Association for the ensuing year resulted in the unanimous choice of the following: President, William H. Elliott (N. Y. C.); second vice-president, C. J. Kelloway (A. C. L.); secretary and treasurer, C. C. Rosenberg, Bethlehem, Pa.

THE PARIS NORTH-SOUTH RAILWAY.—Out of 962 employees on the Paris North-South Railway in 1916, 341 were women. The number of passenger tickets issued in that year was the highest on record, being 66,658,066, as against 54,630,529 in 1915 and 56,388,123 in 1913. At the St. Lazare station alone 7,000,405 tickets were sold.

General News Department

A roundhouse of the Delaware, Lackawanna & Western at Scranton, Pa., was damaged by fire September 13, and 14 locomotives were seriously damaged.

Settlement of a strike of approximately 1,500 clerical workers of the Seaboard Air Line was announced Tuesday to have been effected by the Department of Labor.

Station employees on the Boston & Maine Railroad met Monday and voted to demand an increase in pay. They want eight cents an hour more than they are receiving and a reduction in the amount of work required of them.

A fire started last Saturday night in the interior of the Winchester Bridge tunnel on the Georges Creek and Cumberland branch of the Western Maryland. Both ends of the tunnel were closed in the hope of smothering the fire.

Telegraphers on the Chicago, Burlington & Quincy have taken a strike vote. Their demands include a 25 per cent increase in wages, time and a half for overtime, extra pay on Sundays and certain vacation privileges. Strike agitation by telegraphers on the Illinois Central has resulted in the mediation of the differences between the men and the road.

The Brotherhood of Railroad Trainmen has presented demands to six middle-western roads for an increase of \$10 a month in the compensation of passenger brakemen and baggage men, dating from September 1. The roads affected are the Chicago & North Western, the Chicago, Burlington & Quincy, the Illinois Central, the Chicago Great Western, the Chicago & Alton, and the Chicago, Rock Island & Pacific.

At the time of writing the strike of freight handlers and freighthouse clerks at Kansas City had not yet been settled. The Atchison, Topeka & Santa Fe, and the Chicago, Burlington & Quincy had nearly full forces of men at their respective freight houses, while the Chicago, Rock Island & Pacific had about 10 per cent of the usual number of men at work, and the freighthouses of the other roads were closed. Switchmen and teamsters are threatening to call sympathetic strikes.

Cameron B. Buxton, former general agent of the Atchison, Topeka & Santa Fe at Philadelphia, and since last fall vice-president of H. L. Edwards & Co., cotton merchants of Dallas, Tex., has been appointed assistant director of the section of transportation of the United States Food Administration. This section is under the direction of Edward Chambers, vice-president of the Santa Fe, his services having been given free to the Food Administration by the railroad. Mr. Buxton's services have also been donated by his company.

A strike of shopmen of the Kansas City, Mexico & Orient was settled through mediation on September 14, following conferences between committees representing the shop crafts and officers of the road. The men had asked for a 10-cent increase in wages, and were offered an increase of two and one-half cents an hour by the company. The compromise agreement, which was reached on September 14, provides for an increase of from three to six cents an hour for mechanics, helpers and car-men, and two and one-half cents for apprentices. The men had been off work for nine days.

Press despatches from Petrograd dated September 18 said that David R. Francis, the American ambassador, had authorized the announcement that he has received a promise by the Russian government that the recommendation of the Stevens commission concerning transportation improvements will be carried out immediately. John F. Stevens and the others in his party are on a three weeks' tour of Siberia in company with Russian officials, who have been instructed to make the improvements suggested by the commission. The ambassador says that the carrying out of the commission's suggestions will improve the carrying capacity of the trans-Siberian Railroad 30 per cent.

Five More Engineer Regiments

Recruiting officers in several of the large cities of the country are advertising for recruits for five additional engineer regiments, one of which, the 21st Engineers, will be for constructing light railways. The remaining four include the 20th, forestry; the 23rd, highway; 25th, construction, and the 26th, supply and water supply. For the 21st, the light railway, men trained in the following trades are wanted: Timbermen, bridge carpenters, masons, pipe fitters, steam fitters, hoisting engineers, firemen, dinky runners, teamsters, track layers, construction foremen, pile drivers, concrete foremen, telegraph linemen, riggers, cooks, machinists, blacksmiths, transimen, surveyors, draftsmen, storekeepers, machine repairers, clerks, electricians, oilers, painters, rod drillers, powdermen, signal installers and bridgemen.

Seven Killed in Burlington Wreck

In a rear-end collision of two stock trains on the Chicago, Burlington & Quincy at 11:05 p. m., September 16, near Earlville, Ill., seven stock men were killed and six were injured. The men were riding in the first coach ahead of the way car of the foremost train when the train behind, which had run past a block signal and flagman, crashed into it. Five of the men were killed instantly, and two died later at a hospital in Aurora. When the engineer of the second train saw the crash was inevitable, he jumped from the engine, thereby sustaining slight injuries. Preliminary investigations by the company tend to show that the accident was caused by the fact that the engineer of the second train was asleep until his train was too close to the preceding one to prevent the accident. He, in fact, admitted that he was not fully awake at the time, and attributes his drowsiness to having taken some medicine to cure a cold. Traffic to Chicago was tied up for several hours following the wreck.

Loyal Union Men Protected by Court

Twenty-two members of the Chicago lodge of the Brotherhood of Railroad Trainmen have found it necessary to appeal to a court for protection of their membership rights because, they maintain, they remained faithful to a promise made by the brotherhoods to Congress in January. According to their contention, when the committee on interstate and foreign commerce of the House of Representatives was considering the advisability of giving the President the power to force trainmen to remain at their posts in the event of a strike, representatives of the brotherhoods agreed that if such authority was withheld, the men they represent would be found loyal to the government, and would do nothing to interrupt the operation of trains in case of threatened or actual warfare. Among those who, they assert, gave this guarantee to the government was W. G. Lee, president of the Brotherhood of Railroad Trainmen. About six months later, when he was dangerously ill, 2,500 Chicago switchmen, under the orders of James Murdock, vice-president of the B. of R. T., struck, thereby tying up movements of troops and government supplies. It is Murdock's contention that Thomas Dodge, acting president in place of Lee, gave him authority to order a strike. As a matter of fact, Dodge did give the order, but later rescinded it before the strike went into effect. In the face of the obvious illegality of the strike, 22 switchmen in the employ of the Illinois Central recently had charges preferred against them by the Chicago lodge of the B. of R. T., stating that by refusing to obey the strike order they made themselves liable to expulsion from the union. Upon application to the courts they secured an injunction preventing the Chicago lodge from taking any action to prejudice their membership rights on the grounds that only the grand lodge has the authority to expel members, and that the strike order which the men disobeyed was in itself a violation of the brotherhood's constitution, as it had been given in direct contravention of the order of the president of the union.

Stockholders Asked to Express Opinions

"The co-operation of the stockholders is earnestly invited to continue the successful practice established three years ago of making the annual meeting not merely a conventional routine, but a forum for the expression of the views of individual stockholders upon the policies and problems of the company." This statement is contained in a letter which has been forwarded to the stockholders of the Southern Railway by President Fairfax Harrison, giving notice of the annual meeting of stockholders to be held in Richmond, Va., on October 9. The letter states that the principal officers of the Southern will be in attendance to answer questions directed to the management, or to any detail of the company's business, and adds: "You are earnestly invited to attend in person; or, if that shall be impossible, to have your own personal representative in attendance in your behalf, or to address to the undersigned in writing what you might say if present."

Exemption Boards Praise Roads

The military exemption boards in northern Illinois districts have strongly commended the railroads for their "unselfish patriotism" in closely limiting claims of their employees for exemption from military service. R. H. Aishton, president of the Chicago & North Western, and chairman of the central department committee of the Railroads' War Board, promptly notified the exemption boards that the railroads would not ask for exemption for employees by classes, nor would requests be made for individual exemptions unless necessary for the successful operation of the roads. Each road designated one of its highest officers as exclusively authorized to approve claims of employees for exemption.

"This action of the railroads established a precedent, which has been followed by all other large employers of labor," said H. H. Merrick, chairman of the consolidated exemption boards of Illinois. "This policy assured the best results possible for the employer, the employee and the nation. . . . The railroads are deserving of full credit."

Tobacco for the Men in France

Every Pennsylvania Railroad man who goes to France with the army, who joins the marine corps, or enlists in the navy, will, from time to time—probably as often as once a month—receive from another Pennsylvania Railroad man, at home, a package of tobacco and cigarettes. Each package will contain a self-addressed post-card from the employee whose contribution provided the gift.

This arrangement has been made possible by the establishment of the Pennsylvania Railroad Tobacco Fund. More than 2,500 employees of the Lines East of Pittsburgh have already enlisted. Some of them are in France now; others are on their way; the remainder are preparing to go. The object of the fund is to maintain personal contact and the spirit of fellowship between those who go and those who stay.

Every contribution of 25 cents provides for a package of "smokes," which would cost 45 cents retail at any cigar store. For each 25-cent contribution the giver signs and addresses a post-card, which will be enclosed with one of the packages. The recipient is expected to put his own name on the card, perhaps write a brief message, and send it back by the next mail.

American Gear Manufacturers Meet

The American Gear Manufacturers' Association held its semi-annual session in Chicago, September 13, 14 and 15.

F. W. Sinram, of Van Dorn, Dutton & Co., Cleveland, O., president of the organization, opened sessions Friday morning. A paper on Advertising Don'ts was then read by J. C. McQuiston, advertising manager of the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa. W. H. Phillips, of the R. D. Nuttall Company, Pittsburgh, followed it with a talk on the Heat Treating and Hardening of Gears.

In the afternoon the convention men were the guests of Chicago members. An automobile trip of about 75 miles through Chicago's park system was made.

On Saturday, a paper by B. S. Waterman, of the Brown & Sharpe Manufacturing Company, on Inspection of Gearing, was read; also another by H. E. Eberhardt, of the Newark Gear Cutting Machine Company, on Spur Gearing by the Rotary or

Disc Cutting Process; and another by F. Schneider, of Van Dorn, Dutton & Co., Cleveland, on Spur Gears by the Shaper Method.

The Bridge and Building Convention Exhibit

Although the exhibit of the Bridge and Building Supply Men's Association, held in connection with the annual convention of the American Railway Bridge and Building Association, is almost a month in the future, 15 firms have made reservations of space, a larger number than at this time in any previous year. An interesting feature of this year's exhibit is the fact that a number of the firms which have already reserved space have indicated their intention of making more elaborate exhibits than previously, and have asked for larger allotments. It is expected that at least 30 to 40 companies will present exhibits.

Among the firms which have already reserved space are the following:

American Hoist & Derrick Co., St. Paul, Minn.
American Valve & Meter Co., Cincinnati, Ohio.
Carbie Mfg. Co., Duluth, Minn.
Chicago Bridge & Iron Works, Chicago.
Detroit Graphite Co., Detroit, Mich.
Paul Dickinson, Inc., Chicago.
Fairbanks, Morse & Co., Chicago.
H. W. Johns-Manville Co., New York.
The Lehon Co., Chicago.
C. F. Massey Co., Chicago.
Mudge & Co., Chicago.
George P. Nichols & Brother, Chicago.
Patent Vulcanite Roofing Company, Chicago.
Standard Asphalt & Refining Co., Chicago.
Simmons-Boardman Publishing Co., New York.
Texas Co., Houston, Texas.
U. S. Wind Engine & Pump Co., Batavia, Ill.
Western Roofing & Supply Co., Chicago.

Railway Fire Protection Association

The fourth annual meeting of the Railway Fire Protection Association will be held at the Planters Hotel, St. Louis, Mo., October 2, 3 and 4.

The opening session will begin at 10 A. M. on October 2.

The afternoon session will be devoted to the presentation and discussion of the report on Statistics, E. B. Barry, of the Southern Railway, chairman, and to a discussion of a number of miscellaneous fire dangers and hazards.

At the morning session on October 3, reports will be presented by the following committees:

Handbook on Railroad Fire Prevention and Protection; C. N. Rambo, Norfolk & Western, chairman.

Fire Prevention and Protection in Terminal Classification and Storage Yards; F. A. Greene, Pennsylvania Railroad, chairman.

Electrical Hazards; T. S. Potts, Baltimore & Ohio, Chicago Terminal, chairman.

Locomotive Spark and Ash Pan Hazard; E. C. Sasser, Southern Railway, chairman.

At the afternoon session reports will be submitted by the following committees:

Wharves and Piers; W. F. Hickey, New York, New Haven & Hartford, chairman.

Fire Protection in Passenger Equipment; G. L. Ball, St. Louis-San Francisco, chairman.

Explosives and Other Dangerous Articles; W. S. Topping, Bureau of Explosives, chairman.

At the morning session on October 4, there will be presented a committee report on Hose and Hose Couplings; F. H. Elmore, Southern Railway, chairman. A paper will be read on Hazards in Connection with Storage of Pulverized Coal, by C. P. Beistle, chemist with the Bureau of Explosives; and motion pictures will be shown illustrating fire prevention on the Baltimore & Ohio.

Railway Club of Pittsburgh

At the first regular meeting of the Railway Club of Pittsburgh, after the summer vacation, to be held on September 28, at the Commercial Club Rooms of the Colonial Annex Hotel, Pittsburgh, A. L. Humphrey, vice-president and general manager of the Westinghouse Air Brake Company, will present a paper entitled Ammunition Problems in War Time. This paper will be illustrated by lantern slides and moving pictures, and is devoted to problems arising in the manufacture of ammunition in quantities necessary to equip and maintain a large army and the effective mobilization of our material and industrial resources for that purpose.

The Railway Real Estate Association

The 1917 convention of the Railway Real Estate Association, which was to have been held in Duluth, Minn., this coming October, has been postponed.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. K. of N. J., 143 Liberty St., New York. Next meeting, October 16-17, St. Louis.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 16-18, 1917, Chicago.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—E. R. Woodson, Rooms 1116 Woodward Bldg., Washington, D. C. Next meeting, September 26, Congress Hotel, Chicago.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement B. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

CENTRAL RAILWAY CLUB.—J. D. Younger, 35 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CINCINNATI RAILWAY CLUB.—H. Bount, Chief Interchange Inspector, Cinti Ry., 101 Carey Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Statler, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 568 Union Arcade Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

INVESTMENT BANKERS' ASSOCIATION OF AMERICA.—Frederick R. Fepton, 11 W. Monroe St., Chicago. Annual convention, October 1-3, 1917, Baltimore, Md.

MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES.—Charles E. W. Hager, Post Worth 14, Denver City, Fort Worth, Tex. Next convention, October 16-18, 1917, Cleveland, Ohio.

NATIONAL ASSOCIATION OF RAILWAY COMMISSIONERS.—Jas. B. Walker, 120 Broadway, New York City. Next annual convention, October 16, 1917, Washington, D. C.

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

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Geo. A. J. Hochgrebe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Hotel, Buffalo, N. Y.

PACIFIC RAILWAY CLUB.—W. S. Wollner, Assistant to Chief Engineer, Northwestern Pacific R. R., San Francisco, Cal.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial Annex Hotel, Pittsburgh.

RAILWAY FIRE PROTECTION ASSOCIATION.—C. R. Edwards, office of the president's assistant, Seaboard Air Line, Norfolk, Va. Next meeting, October 24, 1917, St. Louis, Mo.

RAILWAY REAL ESTATE ASSOCIATION.—R. H. Morrison, Assistant Engineer, C. & O., Richmond, Va. Next convention to have been held October, 1917, Duluth, Minn., indefinitely postponed.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W., St. Louis, Mo. Next annual convention, September 18-21, 1917, Hotel Auditorium, Chicago.

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

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—L. W. Cox, N. & W., Philadelphia, Pa. Next annual convention, October 16-18, St. Louis, Mo.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swenson, 291 Broadway, New York. Regular meetings, 1st Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. I. Wells, Gen'l Asst, Erie R. R., 1924 Greiner Bldg., Pittsburgh, Pa. Meetings bi-monthly, Pittsburgh.

UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

WESTERN CANADIAN RAILWAY CLUB.—K. W. Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

WESTERN SOCIETY OF ENGINEERS.—Edgar S. Nethercut, Acting Secretary, 1735 Monandnock Bldg., Chicago, Ill. Regular meeting, first Monday in month, except January, July and August. Extra meetings generally on other Monday evenings except in July and August.

Traffic News

The Railroad Commission of Louisiana issued an order on September 11, modifying the average demurrage agreement to conform with the average agreement in force on interstate commerce.

Under a decision handed down September 15 by the New Jersey Board of Public Utility Commissioners, the Pennsylvania, the West Jersey Seashore, the Philadelphia & Reading and the Atlantic City Railroads are allowed to make increases in commutation fares and excursion or round trip tickets applying on intrastate trips in southern New Jersey.

A revision of class rates and a 15 per cent increase in freight rates proposed by Ohio railroads were suspended on September 13 for 30 days by the Public Utilities Commission of Ohio. The railroads in Missouri recently filed a request with the Missouri Public Service Commission to have their application for a general 15 per cent increase in freight rates postponed indefinitely.

J. B. Jemison & Co., lumbermen of Thomasville, Ga., have issued to dealers a striking appeal for conservation of freight cars. Pointing out that the average capacity of box cars is 40 tons, and that the average load is only 17 tons or 43 per cent of capacity, everybody is urged to utilize the 57 per cent of facilities available, but not used. "It is, therefore, not only the patriotic duty of every lumberman, but it is to our own advantage, and a matter of plain, common, every-day, business sense, to load every car, every time, to full capacity, and load them quick. Put on every foot, every time, that every car will carry, and do it quick. . . ."

The Buffalo, Rochester & Pittsburgh and the New York, New Haven & Hartford have announced plans for "sailing days" on l. c. l. freight. On the Buffalo, Rochester & Pittsburgh, stations have been divided into five classes, according to the importance and the amount of traffic moving to them. The days on which freight will be received for certain stations and the leaving time of the train on which such freight will be sent forward are given in a pamphlet just issued to shippers. For certain points freight will be received daily, for others daily except Saturday, for a third class except Saturday and Monday, for a fourth class on Monday, Wednesday and Friday, and for a fifth class on Tuesday, Thursday and Saturday.

Adams Express Declares Two Days' Embargo to New England Points

The Adams Express Company announced Tuesday that it had declared an embargo, effective Thursday and Friday of this week, on express shipments in both directions between New York City, Brooklyn, Jersey City and Hoboken and all points on its lines in New England, except Government shipments and foodstuffs.

The reasons given are the unprecedented volume of matter offered for movement by express, rendered more acute by the heavy movement of Government shipments, as well as the restriction of express equipment, due to the handling of large troop movements and their accompanying impedimenta.

The Movement of Selected Men to Cantonments

It will take all of the 1,500 "tourist" sleeping cars available and 5,000 coaches to transport the 194,800 men, who constitute 40 per cent of the citizen-soldiers selected for military service, and who are being moved from their homes to the 16 cantonments of the government during a five-day period, which began on September 19. Publication of any routes or schedules of military movements is prohibited, but it can be said that the government and the railroads have co-operated in making every possible provision for the safe, comfortable and prompt transportation of the citizen-soldiers. Generally speaking, the "tourist" sleeping cars will be used by those located farthest from the cantonments, while the day coaches will be used for the shorter trips. All arrangements are made for stops for meals en route, wherever necessary.

Unlike movements of the "regulars" or national guards, the citizen-soldiers will not be accompanied by officers. The various examining boards throughout the country have notified each man the exact date he is to travel, where he is to take a train, the number of the train and its time of departure. These boards have also designated one man who will be in charge of each lot of men entraining at each place during the five-day period. The number of men to assemble daily at each place of entrainment ranges from two to several hundreds. The men from the smaller places will be carried on regular trains. Extra coaches will be added as more detachments are picked up. When the extra coaches reach a certain number they will be detached from the regular trains and made up into special trains. Each "tourist" sleeping car will carry 40 men, and the average in each day coach will be 50 men. From the larger cities the men will travel all the way in special trains, as a rule.

Navy to Help the Car Loading Campaign

The Bureau of Supplies and Accounts, Navy Department, has issued instructions to navy contractors concerning car supply and expeditious freight movements. Paymaster Gen. Samuel McGowan has called special attention to the fact that in the existing emergency it is necessary that there be no delay to matters in which the navy is interested, and advises contractors of the methods to be followed to hasten shipments for the navy. It is essential that contractors endeavor to have cars placed or consignments accepted and moved before requesting assistance from the government. If after reasonable effort on the part of the contractor it is impossible to secure car equipment, they are to advise the Bureau of Supplies and Accounts. It is important that cars be loaded to full capacity. Also that equipment be promptly unloaded and released. Effective co-operation on the part of all concerned will materially assist in relieving the car shortage situation and congested traffic conditions.

Aishton Points Out Great Increase in Freight Traffic

The magnitude of the increases which have taken place in the freight traffic of the railways of the United States within the last two years, and of the advances in efficiency which have had to be achieved in order to handle it, were shown in a striking manner by R. H. Aishton, president of the Chicago & Northwestern, in an address before the St. Louis Railway Club, at St. Louis, Mo., on September 14.

"At the present rate of movement," said Mr. Aishton, "the railways will handle 510,000,000, or 52 per cent, more tons of freight in 1917 than they did in the fiscal year ended on June 30, 1915. On the basis of the present number of tons handled per train, it would take 720,000 freight trains, containing 18,000,000 freight cars, merely to handle this increase in tonnage over 1915. If all the cars required to handle this increase in tonnage were made up in a single train, that train would be 136,363 miles long."

Mr. Aishton gave another striking illustration to drive home the same point: "The increase in the freight traffic of our railways in 1917 over the year ended on June 30, 1915," he said, "will amount, at the present rate, to as much as the total traffic handled before the war by all the railways of Germany, France, Russia, Spain, Sweden, Switzerland, Roumania, Holland, Canada, South Africa, Mexico, Japan, Brazil and South Wales. In other words, the total ton-miles of traffic handled annually in those 14 countries before the war was 141 billion ton-miles, and at the present rate the increase in this year over the fiscal year 1915, in the ton-miles handled by our railways, will be just about 141 billion ton-miles."

Marketing Grain at Country Points

The United States Department of Agriculture has issued Bulletin 558, on marketing grain at country points, which contains much information of interest to producers, shippers, dealers and consumers. The government investigators declare that the producer of high-quality grain often receives less than it is worth in order that the buyer may pay an equal price to a grower of grain of inferior quality. If the farmer would clean his grain he could not only demand top prices, but would thereby obtain screenings worth \$10 to \$25 a ton for feed. Many elevators are open only during the harvest season; but farmers should encourage elevators which remain

open and provide a local market throughout the year. To determine for or against storage of grain on the farm, it is necessary to consider the interest on the investment, interest on the grain in store, natural shrinkage and loss by rodents, convenience of marketing, condition of roads at time of delivery, price at harvest time, and the probable price at some future date.

Car Shortage Again Reduced

Reports to the American Railway Association show that on September 1 the excess of unfilled orders for cars in some parts of the country over surpluses of cars in other places was 31,591, a reduction of 14 per cent, as compared with the previous month.

In the latter part of April, when the Railroads' War Board was organized to co-operate with the government in all matters of the railroads affecting the conduct of the war, there was an excess of unfilled car requisitions over surpluses amounting to 148,627 cars.

As it was impossible to create cars over-night, not to mention locomotives, terminal facilities, tracks and other facilities just as badly needed, the War Board directed its first efforts at securing greater use of the facilities which existed, mainly freight cars. The object was to more nearly take care of all the orders of the government and shippers as well. Railroads were instructed to do things within their own province which would increase the efficiency of equipment and at the same time to secure the co-operation of shippers, consignees and commercial bodies.

The success of the combined efforts of state and federal regulating bodies, shippers, commercial organizations, the railroads and seasonable weather, may be seen from the fact that the railroads have, with practically no increase in facilities, handled the greatest amount of freight in their history in the past four months.

The excess of unfilled car orders has been cut down from 148,627 on May 1, to 106,649 on June 1, to 77,682 on July 1, to 37,062 on August 1, and to 31,591 on September 1, thus achieving an improvement in four months of 78 per cent.

President Holden Warns Public to Ship Now

A warning to buyers and shippers generally, but especially those of the central and western states, to ship all the freight they can now, was issued on September 15 by Hale Holden, president of the Chicago, Burlington & Quincy, and one of the five members of the Railroads' War Board. "The time to make hay is when the sun shines, and the best time to ship, under such conditions as those now existing, is when the railways have cars and the weather is good," he said. "The situation as to car supply is good now—better than at any time since the war began. In other years when there have been congestions of traffic they have usually begun about the middle of October, for that is when the movement of traffic normally becomes the heaviest. The same conditions, only intensified, may be expected this year. Hence, during the next few weeks, while the railroads have the cars and locomotives available, and while weather conditions are most favorable, every ton of freight that can be shipped should be."

"Fairfax Harrison, chairman of the Railroads' War Board, has just issued an appeal to farmers to send their wheat to market now, so that the railroads can transport it to storage points for ready distribution, and to mills to be made into flour for domestic use and for export to our allies, whose great needs can be supplied promptly because ships are available to our various ports. He points out that as the President has fixed the price of wheat for a year, the farmer can lose nothing now, while by holding his grain back he would lose interest on money and by deterioration of the grain."

"I would especially urge now the shipping not only of wheat, but of all commodities that can be shipped, and especially of coal. The railroads are now able to fill practically all orders for cars for coal. In fact in the past few weeks they have furnished more cars to mines in Illinois than have been loaded. There has been a marked reduction in the output of Illinois coal, due to labor troubles and other conditions for which the railroads are not responsible. They should not be blamed later for a coal shortage due to failure to ship coal at this time when the roads have enough engines and cars with which to move it."

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The hearing on the valuation of the Kansas City Southern announced for September 18 at Kansas City before Examiner John H. Gray was cancelled and a hearing assigned for October 8.

The Interstate Commerce Commission has suspended until December 30 a number of additional tariffs filed by the railroads in the eastern commodity rate case, together with some additional tariffs in the eastern live stock and fresh meat case. The tariffs were to become effective on September 15 and later dates.

The commission also suspended until January 13 proposed increases on commodities between trunk line territory and western points rates, on canned fish from New England points by rail and water to southern points, transcontinental rates on bottles westbound, and proposed increased charges for car float service in New York harbor.

H. C. Barlow, traffic director of the Chicago Association of Commerce, and chairman of the executive committee of the National Industrial Traffic League, who has been in Washington during the summer collaborating with the Division of Car Service of the Interstate Commerce Commission, has completed his work in Washington and returned to Chicago.

The commission has made public a tentative opinion in the western trunk line iron and steel case, holding that the proposal of the carriers to increase or cancel practically all commodity rates on iron and steel articles applying within western trunk line territory, and from points east of Chicago and the Mississippi river to points in western trunk line territory, are found generally not justified, but authority is given to publish somewhat higher rates than are at present maintained. The suspended schedules are required to be cancelled.

Reconsignment Case

The commission has made public the tentative opinion of Attorney-Examiner C. V. Burnside in the case involving changes in the regulations affecting the diversion or reconsignment of carload shipments proposed by practically all steam roads in the country. The proposed tariffs are upheld in many particulars, but many modifications are also ordered and the suspended tariffs are required to be cancelled. The findings in the tentative opinion are as follows:

1. The service of reconsignment is necessary, and should be provided for by the carriers at charges based upon cost, including a reasonable profit. Previous findings of the commission are reaffirmed. Undue detention of cars at point of reconsignment should be prevented by regulations which may include penalty charges.

2. The definitions of diversion or reconsignment should be clarified, and certain proposed rules should be so amended as to express the intent of the carriers, as shown by the record.

3. Proposed charges for change in the name of consignor not justified.

4. Proposed charge of \$2 per car for reconsignment in transit prior to arrival of shipment at original destination justified.

5. Proposed charge of \$2 per car for reconsignment at original destination on order received by the carrier in time to permit instructions to be given to yard employees prior to arrival of shipment not justified.

6. Proposed charge of \$2 per car for stopping carload shipments in transit to be held for orders prior to reaching original destination justified.

7. Proposed charge of \$5 per car for reconsignment at original destination on orders received by carrier after arrival or too late to permit instructions to be given yard employees before arrival justified; but carriers should give shippers advance notice of arrival at reconsigning points of shipments extraordinarily delayed.

8. Proposed charge of local tariff rates for movement of

carload shipments within switching limits after placement for unloading justified.

9. Proposed charge of \$2 per car for reconsignment within switching limits before placement for unloading on orders received within 24 hours after arrival justified.

10. Proposed charge of \$5 per car for reconsignment within switching limits before placement for unloading on orders received more than 24 hours after arrival justified.

11. Proposed application of charge for reconsignment service regardless of method of freight rate construction justified.

12. Proposed regulations prohibiting reconsignment to a point or points formerly under embargo, when the shipments are forwarded from point of origin prior to termination of embargo, justified.

13. Application of the proposed regulations to the reconsignment of shipments of coal not justified on the record.

14. Proposed regulations for reconsignment of grain at Pittsburgh disapproved as unduly prejudicial to Pittsburgh.

15. Proposed increases in charges for reconsignment by certain New England carriers not justified.

16. Respondent should provide by tariff for relief from reconsignment charges when reconsignments are necessitated by embargoes or by confiscation of coal.

17. Tariffs under suspension required to be cancelled, but without prejudice to the right of carriers to file new tariffs in conformity with the views expressed.

COURT NEWS

Crossing Accident—Contributory Negligence of Team Driver

The Kansas Supreme Court holds that the rule that contributory negligence is not to be ascribed as a matter of law to one who, through bewilderment, makes an injudicious choice of a means of escape from a sudden peril does not apply in an action against a railroad for injuries resulting from a crossing collision, where the railroad's only negligence was running the train at 16 miles an hour across a city street, and the plaintiff, while driving his team at an ordinary walk, could have seen the train when it was 300 feet away and he was 22 feet from the track, and there was nothing to prevent his turning to one side except his fear and excitement.—*Moler v. Rock Island (Kan.)*, 166 Pac., 488. Decided July 7, 1917.

Supplying Water From Streams to Locomotives

The Kansas Supreme Court holds that a railroad company, as a riparian owner, has the right to make reasonable use of the water of a stream for the purpose of supplying its engines and operating its road. Reasonable use means such use as is consistent with the equal rights of other riparian owners. Where water is abundant there is no occasion to dispute about its use. Only when the flow becomes scanty does necessity for adjustment arise. In this case matters were brought to a crisis by an unprecedented drought. The trial court found specifically that the railroad's dam did not back-water far enough to interfere with the operation of the plaintiff's up-stream mill, and that the quantity of water taken by the railroad did not in any appreciable degree affect the operation of the plaintiff's down-stream mill.—*Atchison, T. & S. F. v. Shriver (Kan.)*, 166 Pac., 519. Decided July 7, 1917.

Safety Appliances

The Montana Supreme Court holds that under section 2 of the Safety Appliance Act of 1910, requiring that all cars subject to the provisions of the act be equipped with sufficient hand brakes, the absolute duty was imposed on the defendant railroad to furnish a car with the several parts of the hand-braking appliances so securely connected that the brakes could be set with safety in the ordinary routine of a brakeman's duties, and it being necessary to that result that the chain be hooked over the end of a rod, the duty was imposed on the railroad to see that such connection was made in the first instance, and the same high standard of duty continued to see that the chain and rod were connected securely at all times, so that it was liable for injuries to a brakeman proximately resulting from the breaking of a wire which was used to connect the rod and chain.—*Armitage v. Chicago, M. & St. P. (Mont.)*, 166 Pac., 301. Decided June 28, 1917.

Equipment and Supplies

LOCOMOTIVES

THE NEW YORK CENTRAL has reserved space with the American Locomotive Company for about 250 additional locomotives.

THE NORFOLK & WESTERN is said to have reserved space with one of the locomotive builders for a number of large locomotives.

FREIGHT CARS

THE ANACONDA COPPER MINING COMPANY, Butte, Mont., is inquiring for 10 box cars.

THE SINCLAIR REFINING COMPANY, Coffeyville, Kan., is inquiring for 60 steel underframes.

THE TORONTO, HAMILTON & BUFFALO has ordered 5 caboose cars from the American Car & Foundry Company.

PASSENGER CARS

THE BROOKLYN RAPID TRANSIT is inquiring for prices on 250 street cars and 500 trucks.

IRON AND STEEL

THE PENNSYLVANIA has ordered 270 tons of structural steel from the Morava Construction Company, Chicago, for steel frames for four box-car unloading machines at the Northern Central elevator, Baltimore, Md.

THE JAPANESE IMPERIAL RAILWAYS.—An associated Press despatch from Seattle on September 19, said: Large quantities of old steel rails have been purchased in the Northwest by Japanese brokers and shipped to Japan, it was learned today. Twenty-three hundred tons of old rails have been shipped in the last few weeks, and additional shipments are being assembled. Brokers are paying \$70 a ton for the rails, which originally cost \$24 a ton. In turn they are selling them to the Japanese railroads for \$100 a ton.

CAPE TO CAIRO RAILWAY.—A special despatch from Elizabethville, Africa, to The African World announces the completion, in connection with the Cape to Cairo Railway, of the railroad to Bukama on the navigable Congo. The line now covers a distance of 2,700 miles direct from Cape Town via Rhodesia.

GREECE CONNECTED WITH CONTINENTAL EUROPE BY RAIL.—On May 8, 1916, the railway was completed between Gilda, on the Saloniki-Monastir line, and Pappapuli, on the Thessalian frontier, a section of 56 miles, linking Greece with the rest of Europe. After the war through trains will be run from Paris to Athens-Piraeus, shortening the time to some 60 hours.

REPORT OF SOUTH AFRICAN RAILWAYS FOR 1916.—The financial returns of the railways and harbors for 1916 show an increase in revenue of \$5,154,485 over 1915. Expenditures totaling \$15,335,670 were authorized for the railroads, of which \$6,377,388 was for capital, \$200,456 for betterment, \$8,388,619 for renewals, and \$330,275 for working purposes. Fifteen new locomotives—six standard and nine narrow gauge—costing \$324,036 were placed in service, and for new passenger coaches and freight cars \$2,920,611 was expended. During 1916 heavy shipments of agricultural products and other requirements severely taxed the available rolling stock; the abnormal traffic necessitated the ordering of more equipment. On December 31, 1916, there were being built or ordered locomotives valued at \$5,207,647; passenger coaches, \$2,207,143; and freight cars, \$4,107,476. The proposed electrification of South African railways again received consideration during 1916. On the recommendation of the railway board an English firm is to investigate and report upon the feasibility of electrifying certain sections of the system. This report is also to include the estimated cost of conversion, the benefits to be derived therefrom, and the effect upon operating costs.

Supply Trade News

George A. Turville, secretary and treasurer of the Crucible Steel Company, has also been elected a vice-president in addition. J. M. McComb, credit manager, has been made assistant treasurer.

Charles M. Terry, president of Charles M. Terry, Inc., has arrived in New York from Australia and will be temporarily located at the offices at 23-25 Beaver street. This company exports machinery and railway and engineering supplies.

The Hollow Tile Building Association, an organization composed of manufacturers representing 90 per cent of the total production of this burned clay product, has opened an office in the Conway building, Chicago. E. R. Sturtevant, who has been engaged in the manufacture of hollow tile, has been elected secretary and treasurer.

The Ransome Concrete Machinery Company, New York, has been reorganized and reincorporated as a new corporation with larger capitalization. It will enlarge and expand its business to include the entire line of building contractors' equipment, contractors' machinery, etc. Frank L. Brown is director and president, and John D. Givens, director and treasurer.

A. W. Ransome, who has been engaged for nearly 20 years in the development and manufacture of concrete machinery, has been appointed to the position of manager and chief engineer of the mixer department of the Blaw-Knox Company, Pittsburgh, Pa., which has taken up the manufacture of concrete machinery, developed during the past two years by Mr. Ransome.

The United States District Court for the Western District of New York has handed down its decision that the Gould "Simplex" system of electric car lighting is not an infringement of the Creveling patent, 747,686, owned by the Safety Car Heating & Lighting Company, and has directed that the suit be dismissed with costs to the Gould Coupler Company. This disposes of the last charge that the Gould "Simplex" system infringes any patent.

The Bradford-Ackermann Corporation, Forty-second Street Building, New York City, has been made the eastern sales office for the Young Brothers Company, Detroit, Mich. The sale of Young ovens, for jappanning and drying purposes, will in the future be handled by this eastern office for the New England states, New York, New Jersey, Maryland, Delaware and eastern Pennsylvania. An engineering department will likewise be available for manufacturers in the East who are interested in quick drying and baking processes, and special oven designs will be offered to meet various requirements.

W. G. Dunham, since 1907 in charge of the manufacture of McCord & Co. products in Canada, with headquarters at Brantford, Ont., died September 8 at the age of 62 years. Mr. Dunham was born in Canada, and came to this country as a young man. In 1884 he entered the employ of the Chicago, Burlington & Quincy, and was with that road as foreman of the old Sixteenth street passenger yards of that company in Chicago during the Debs strike in 1894, when he succeeded in keeping his department operating without damage to railroad property. He entered the employ of McCord & Co. in 1902, and prior to his going to Brantford was mechanical inspector.

H. E. Hiltz, district engineer at San Francisco for the Portland Cement Association of Chicago, has been elected general manager, with headquarters at Chicago, succeeding J. P. Beck, deceased. Mr. Hiltz was born in New York and received his engineering education at the University of Pennsylvania. He began his business career with the Mexican International as a rodman, and later became associated with the Philadelphia & Western. For two years he was instructor in the engineering department of the University of Pennsylvania, which position he left to enter the service of the New York Central, where he remained until 1913. On the latter date he became road engineer of the Portland Cement Association, and in 1915 was appointed district engineer at San Francisco, which position he held until his recent promotion.

Railway Construction

CHESAPEAKE & OHIO.—Work is now under way on additions to the Russell, Ky., yard, calling for about 800,000 cu. yd. of earth excavation. The contractors are the Langhorne & Langhorne Company, Richmond, Va.

CHICAGO GREAT WESTERN.—A contract has been awarded by this road to T. S. Leake & Co., Chicago, for the construction of an 11-stall roundhouse at Clarion, Iowa. The structure will replace a 14-stall building, which was destroyed by fire last April.

DELAWARE & HUDSON.—This company is now at work building a new line to be used as third track from Schenectady, N. Y., to Richmondville Summit, about 12.59 miles. This is located on a new right of way not adjacent to the present right of way, as the line is being constructed on a maximum of 0.5 per cent grade compensated, and maximum curvature of four degrees, to be used as a north bound freight line on the Susquehanna division.

GREAT NORTHERN.—This company is contemplating the construction of a cut-off from the Willmar (Minn.) line to the Fridley terminals. No work is being done on the project at present, and none will be done in the immediate future.

NEW YORK, NEW HAVEN & HARTFORD.—Contracts have been given by this company to the Central Construction Company, Roxbury, Mass., for foundations for bridges, and to the American Bridge Company, New York, for the steel superstructures of bridges, in connection with the work of widening the present two-track South Boston cut to accommodate four tracks. The cut is about one-half mile long, and the work is so involved with operation that the larger part of it will be carried out by company forces. The improvements call for 120,000 cu. yd. of excavation and the construction of 20,000 cu. yd. of masonry; the cost of the work will be about \$1,000,000.

Railway Financial News

BOSTON & MAINE.—James H. Hustis, receiver, has been granted authority by Federal Judge Morton to expend \$365,000 for necessary improvements on the Fitchburg road, a leased line. This expenditure will be borne by the Fitchburg road, whose directors approve it.

CENTRAL VERMONT.—Howard G. Kelley, who was recently elected president of the Grand Trunk, has been elected a director and chairman of the board of the Central Vermont to succeed Edson J. Chamberlin, resigned.

COLORADO & SOUTHERN.—Howard Elliott and O. M. Spencer were elected directors to succeed Harry Bronner and H. E. Byram, resigned.

The directors have declared out of surplus earnings dividends of 2 per cent each on the first and second preferred stocks, both payable October 1 to stock of record September 21.

FITCHBURG.—See Boston & Maine.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—The directors were re-elected at the annual meeting September 18. The date of the annual meeting was changed from the third Tuesday in September to the third Tuesday in May, to correspond with the recent change in the fiscal year of the company.

MISSOURI, KANSAS & TEXAS.—See editorial comments elsewhere in this issue.

SOUTHERN RAILWAY.—A dividend of $2\frac{1}{2}$ per cent on the preferred stock has been declared, payable November 20 to stock of record October 31. This is the first dividend declared on this issue since October, 1914.

Railway Officers

Executive, Financial, Legal and Accounting

B. B. Greer, assistant to vice-president of the Chicago, Burlington & Quincy, at Chicago, has been elected vice-president and general manager of the Colorado & Southern, succeeding E. S. Koller, deceased.

William M. Doulin, assistant treasurer of the Pittsburgh & Lake Erie, at Pittsburgh, Pa., has been appointed treasurer, succeeding J. G. Robinson, deceased, and J. S. McKibbin succeeds Mr. Doulin.

Howard G. Kelley, president of the Grand Trunk and the Grand Trunk Pacific, has been elected also chairman of the board and member of the executive committee of the Central Vermont, vice Edson J. Chamberlin, resigned.

J. G. Rodgers, general superintendent of the Northern division of the Pennsylvania Railroad at Buffalo, N. Y., has been appointed assistant to the president, effective September 20. Until otherwise ordered, he will continue to discharge his present duties in Washington as general agent of transportation for the Railroads' War Board of the American Railway Association.

William H. Biggar, general counsel of the Grand Trunk, at Montreal, Que., has been appointed vice-president and general counsel in charge of all legal matters pertaining to the system.



W. H. Biggar

Mr. Biggar is also vice-president and director of the Grand Trunk Pacific and other associated companies. He was born on September 19, 1852, at Carrying Place, Ont., and was educated at Upper Canada College, Toronto. He entered the service of the Grand Trunk on February 1, 1881, and on December 31, 1902, was appointed assistant general counsel. About two years later he was appointed general solicitor of the same road, and on January 10, 1910, he was appointed general counsel of the Grand Trunk and the

Grand Trunk Pacific; in September, 1914, he was elected vice-president and general counsel of the Grand Trunk Pacific, with headquarters at Montreal, Que., and he also retained the position of general counsel of the Grand Trunk.

Operating

J. L. McKee has been appointed superintendent of the Buffalo division of the Delaware, Lackawanna & Western, with office at Buffalo, N. Y., vice F. M. Benning, resigned.

C. A. Hawkins has been appointed superintendent of the Nezperce division of the Nezperce & Idaho, with headquarters at Nezperce, Idaho. This division was recently acquired from the Lewiston, Nezperce & Eastern.

George A. Codling, assistant division superintendent of the New York Central lines west of Buffalo, at Elkhart, Ind., has been appointed assistant superintendent of freight transportation, with headquarters at Cleveland, Ohio.

W. E. Morse, general manager for the receivers of the Denver & Salt Lake, at Denver, Colo., has resigned, and the duties of that office have been assumed by W. R. Freeman, receiver. M. I. Phelps has been appointed superintendent, vice L. D. Blauvelt, resigned.

R. J. McArt, Jr., superintendent of the Delaware & Hudson at Oneonta, N. Y., has been appointed assistant to general super-

intendent of transportation, with headquarters at Albany, and J. K. McNeillie, general superintendent of the Canadian Government Railways at Moncton, N. B., has been appointed superintendent of the Susquehanna division of the Delaware & Hudson, with headquarters at Oneonta, vice Mr. McCarty.

A. J. Whitney, superintendent of the Maryland division of the Philadelphia, Baltimore & Washington at Wilmington, Del., has been appointed general superintendent of the Northern division of the Pennsylvania Railroad, with office at Buffalo, N. Y.; James Buckelew, superintendent of the Camden Terminal division and West Jersey & Seashore, at Camden, N. J., succeeds Mr. Whitney as superintendent of the Maryland division, and A. M. Parker, superintendent of the Allegheny division at Oil City, Pa., has been appointed superintendent of the Camden Terminal division and West Jersey & Seashore.

W. H. Fogg, superintendent of the northern and southern divisions of the Chicago, Indianapolis & Louisville, with office at Lafayette, Ind., has been promoted to general superintendent at Chicago, succeeding P. L. McManus, resigned, effective September 7. Mr. Fogg was born at Milwaukee, Wis., on May 25, 1868, and entered railway service as a messenger boy in the train despatcher's office of the Lake Erie & Western at Lafayette, Ind., on May 9, 1882. He was later promoted to train despatcher in the same office, and in the early part of 1889 went to Mt. Carmel, Ill., as despatcher of the Cairo, Vincennes & Chicago. From April, 1889, until September, 1889, he was despatcher on the Toledo, St. Louis & Kansas City, and from the latter date until January, 1890, was despatcher on the East Tennessee, Virginia & Georgia, now a part of the Southern Railway system, at Knoxville, Tenn. From January, 1890, to August, 1890, he was despatcher on the Pittsburgh Western at New Castle, Pa., following which he worked for a month as despatcher for the Chesapeake & Ohio at Clifton Forge, Va. He entered the service of the Monon as despatcher on September 1, 1890. In May, 1905, he was promoted to chief despatcher of the northern division, and in June, 1913, was appointed trainmaster of that division. He was promoted to superintendent of the northern division on January 1, 1914, and on January 1 of the following year had his jurisdiction extended over the southern division.

Traffic

J. G. Krener, chief clerk in the office of the general passenger agent of the Western Maryland, has been appointed assistant general passenger agent, with headquarters at Baltimore, Md.

W. E. Duperow, assistant general passenger agent of the Grand Trunk Pacific and the Canadian Government Railways, at Winnipeg, has been appointed general passenger agent of both roads, with headquarters at Winnipeg.

T. D. Geoghegan has been appointed traffic manager of the Gulf, Mobile & Northern, in charge of freight, passenger and industrial departments, with headquarters at Mobile, Ala., vice W. L. O'Dwyer, who has been appointed general freight and passenger agent, with office at Mobile.

G. L. Oliver, assistant general freight and passenger agent of the Ft. Smith & Western, at Ft. Smith, Ark., has been promoted to general freight and passenger agent, with the same headquarters. A. R. Christie, general agent at Oklahoma City, Okla., has been appointed assistant general freight and passenger agent at Ft. Smith. J. J. Gibson, general freight and passenger agent at Ft. Smith, has been appointed general agent to the receiver, with headquarters at Oklahoma City.

Engineering and Rolling Stock

H. A. Woods, assistant chief engineer of the Grand Trunk Pacific, with headquarters at Winnipeg, Man., recently resigned.

A. F. Stotter, supervisor of bridges and buildings of the Northern Pacific at Seattle, Wash., has been appointed division engineer of lines west of Ellensburg, Wash., with headquarters at Tacoma, Wash., vice B. L. Crosby, who has been granted an indefinite leave of absence on account of illness.

B. H. Davis, assistant master mechanic of the Delaware, Lackawanna & Western at Scranton, Pa., has been appointed master mechanic of Scranton, Syracuse & Utica and Bangor & Portland divisions, with jurisdiction over enginehouses and matters pertaining to road work, vice F. H. Reagan, resigned to accept service elsewhere; Charles W. McGuirk, general foreman in the motive power department at Scranton, has been appointed assistant master mechanic, succeeding Mr. Davis; and Joseph Greiser, general foreman in the motive power department at Scranton, has been appointed superintendent of shops, with jurisdiction over the Scranton locomotive shops.

Purchasing

C. N. Davids has been appointed purchasing agent of the Denver & Salt Lake, with headquarters at Denver, Colo., vice A. A. Dawley, assigned to other duties.

Special

Edgar S. Nethercut, who has been elected secretary of the Western Society of Engineers, Chicago, was born at Lake Geneva, Wis., on June 12, 1866, and graduated from the University of Wisconsin in 1889. From 1889 until 1893 he was employed as a draftsman by various companies, following which he was appointed chief engineer of the Paige Iron Works. In 1908 he became track expert in the valuation department, in charge of operation and sales, for the Public Service Commission, First district, New York, and three years later was engaged in the valuation of track for the Detroit United Railways. In the latter part of 1911 he opened offices in Chicago as a consulting engineer, and engaged in steam and electric railway valuation, reinforced concrete construction, sewer construction and building design. From 1914 to 1917 he was in charge of the valuation of track and rolling stock of the Washington Railway & Electric Company, Washington, D. C. On June 11, 1917, he was commissioned major in the Engineer Officers' Reserve Corps, from which position he resigned to become secretary of the Western Society of Engineers.

Railway Officers in Military Service

J. R. Jackson, assistant engineer of tests on the Archison, Topeka & Santa Fe at Chicago, has received a commission as captain of ordnance in the Officers' Reserve Corps, but has not yet been assigned to active duty.

C. F. Stewart, general passenger agent of the Western Maryland at Baltimore, Md., has been granted leave of absence to serve with the Railroads' War Board at Washington, D. C. He will be in charge of work of furnishing loading for all movements of troops over the United States.

Joseph V. Reaph, confidential stenographer to W. W. Atterbury, vice-president of the Pennsylvania Railroad since 1909, has gone to France as secretary to Mr. Atterbury, whose appointment as director general of transportation of the American Expeditionary Force in France is announced elsewhere in this issue.

F. T. Bowles, formerly superintendent of the Lake Erie & Western and the Chicago, Indiana & Southern, and recently assistant superintendent of transportation of the San Antonio & Aransas Pass, has been commissioned as a captain in the Engineer Officers' Reserve Corps, and assigned to the Twenty-first Engineers (railways).

P. Topping and E. Wells, assistant engineers of the St. Louis-San Francisco at St. Louis, Mo., have received commissions as captain and first lieutenant, respectively, in the Engineer Officers' Reserve Corps. Captain Topping has been assigned to the Fifth Engineers, United States Army, and Lieutenant Wells has been detailed to Ft. Leavenworth, Kan.

Railway Age Gazette

Volume 63

September 28, 1917

No. 13

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It is a matter of prime importance at the present time that locomotives be loaded to their full capacity. The larger

Tonnage Rating and the Road Foreman

the train units the more easily the tonnage can be handled, congestion will be relieved and more work will be obtained from the available power. The question has been raised as to whether or not the tonnage rating of locomotives is sufficiently high, especially where the rating is established by the mechanical department. The superintendent of the division can determine this for himself through his road foreman of engines. Here is a man, who from his extensive experience as a locomotive engineer, is in an excellent position to find out whether or not an engine is overloaded, underloaded, or is handling all that it is practicable to give it. The road foreman of engines has an important part to play in the transportation problem and this is particularly true under present conditions. He should be used where by virtue of his previous training he can do the most good. He should not be saddled with a mass of details and perfunctory work which may be done as well by others whose experience does not make them available for as important work.

The Interstate Commerce Commission has issued a new form for monthly reports of railroads to the Commission. One

Net Railway Operating Income

fundamental change which has been made is to make available figures for computing the return being earned on the investment after expenses, taxes and rentals have been paid. Heretofore railway operating income, which is the amount left from revenue after operating expenses, tax accruals and uncollectible revenue have been deducted was the figure used. The new form calls for equipment rents net, joint facility rent, leased road rent and miscellaneous rents to be shown and deducted from railway operating income to arrive at net railway operating income. In addition to giving the figure for investment in road and equipment at the beginning of the month each month, the railroads are also required to give the improvements of leased railway property at the beginning of the month. In other words, the Interstate Commerce Commission will have available for figuring return on investment the amount of investment in the company's owned

road and the amount invested in leased property, and on this total the Commission can figure the percentage of net railway operating income. This is a recognition by the Commission that rentals are a part of expenses analogous, apparently in the Commission's mind, to taxes and that they should properly be deducted before arriving at the amount available for return on total investment. This is obviously logical and proper accounting. There is, of course, the chance that some roads may be paying either too high or too low a rental as compared with the revenue which they are receiving from the operation of leased property. In the aggregate this would cause but a small error.

The completion of the Quebec bridge after two disasters marks a triumph in bridge engineering, yet the ultimate

The Quebec Bridge—A Sermon on Detail

success of this project has rested not so much on a spectacular struggle with well-nigh insurmountable difficulties, as in more or less prosaic effort to perfect the details of this great structure in all its parts. The story of this ill-fated project is a sermon on the importance of minute care in detail, since both of the disasters which befell it were brought about through oversight of seemingly minor features. In the first case it was carelessness in the revision of dead load calculations and in the proportioning of the lacing bars of the compression members. In the second case the design of the saddles by which the span was supported from the elevator hangers was at fault. Bridge engineering is essentially a matter of minute, painstaking detail. Imagination and vision play but a small part in the successful completion of even the most wonderful structure. One of the best illustrations of the importance of detail can be found in the field of movable bridges. In most of the types the fundamental principle is simplicity itself, but ultimate success involved years of experimentation. In one of the first types developed a period of 20 years elapsed after the first structure was built before a second one was attempted. The first one was a most indifferent success, while a greater perfection of working parts in the second led to the repeated use of this design in subsequent structures. Bridges of ordinary proportions built today are better than those of years gone by, not so much because new types or designs have been evolved, but because

greater care is taken in the proportioning of the details and closer attention is given to the perfection of the workmanship in the shop and in the field.

It is unfortunate that some mechanical department officers and foremen, who are hard pushed because of the difficulty of keeping the equipment in shape owing to the lack of material and shortage of labor, have become discouraged and have adopted an attitude of "what's the use." It is little wonder, therefore,

Explanations Will Not Solve the Problem

that one superintendent of motive power recently suggested to a subordinate that he "cut out the calamity howling, and get busy." This is no time to get discouraged and become fainthearted. The most difficult part of the task still lies before the railroads, and every possible effort must be made not only successfully to handle the heavy fall traffic, but to get the equipment into as good shape as possible for the winter. The railroads have accomplished wonders under the direction of their War Board, and the public is showing appreciation of this and is freely giving a large amount of co-operation. In spite of the shortage of men and material the mechanical department can make good in the months to come if it can be inspired and encouraged by the higher officers. There has possibly been too much of criticism and "please explain" and too little of friendly sympathy and encouragement—too little, indeed, of real appreciation for the importance and needs of the department. These are days of big things; men are successfully measuring up to bigger tasks than they ever dreamed of having to handle. The Railroad Y. M. C. A., as an example, had only a comparatively few days to organize its forces with a view to having a responsible representative with the necessary supplies on the great number of trains which took the men of the new National Army to the cantonments. Its leaders would hardly have been criticised if they had passed over this opportunity of serving the second contingent and had started their work on the third one. A representative of the *Railway Age Gazette*, when he returned from the meeting of the International Railroad Y. M. C. A. secretaries and their associates at which the final arrangements were made for this work, said: "I never saw such an enthusiastic bunch of fellows; nothing can stop them." Railway organizations must be thoroughly impregnated with this sort of spirit if they are successfully to overcome the stupendous task which confronts them. It is this spirit that dominates the railways of Canada and is responsible for the remarkable showing that they have made during the past few years in the face of almost insurmountable difficulties. This spirit cannot start from the ranks and work upward; it must start at the top and work down through the entire organization.

THE NEW MEMBERS OF THE COMMISSION

OWING to recent legislation authorizing the addition of two members to the Interstate Commerce Commission and to the death of Commissioner Clements, President Wilson has power to appoint three members of the Commission. The President has had this power for some time. The delay in exercising it may be due to the fact that he is making a special effort to find men who will not only be willing to accept appointment, but who possess the qualifications for membership on the Commission.

There never has been any difficulty in finding men who were willing to accept appointment to the Commission. During the time that the present three vacancies have existed, the politicians at Washington have brought to the President's notice a very large number of men who are quite willing to be appointed. Unfortunately very few of these have the special knowledge, the experience and the ability which members of the Interstate Commerce Commission ought to possess. Most of them are members of state commissions or men who

are or formerly were prominently identified with labor organizations.

The Commission is now composed of three lawyers, two former university professors and a former railway conductor who was a prominent labor leader. Those most directly concerned with the work of the Commission are the stockholders in railways, the business and agricultural interests and railway employees. While there is a former railway employee on the Commission, there are no former railway officers and no business men on it. Why should the banking interest have representation on the Federal Reserve Board, and the manufacturing and industrial interests representation on the Federal Trade Commission and the Tariff Commission, while the railways and the shippers and consignees of freight are left without representation on the Interstate Commerce Commission? The men who manage railways and those who produce and ship goods have to face payrolls and other business expenses. The problem of railway regulation is essentially a business problem. It seems obvious, therefore, that the Interstate Commerce Commission should be composed, to a large extent, of former railway officers and former business men.

Not only has President Wilson put business men on the Federal Reserve Board, on the Tariff Commission and on the Trade Commission, but he has drawn upon the best brains in business in the United States to help him in solving the problems presented to the government by the war. Let us hope that in appointing the three new members of the Interstate Commerce Commission he will follow the precedents which he himself has set in these other fields.

THE MARCH CONVENTION AND EXHIBIT

ALTHOUGH it is still six months before the time for the convention of the American Railway Engineering Association and the exhibit of the National Railway Appliances Association, the cancellation of meetings by a number of large railway associations has led some railway and supply men to question the advisability of holding this meeting and exhibit. Both of the associations are now proceeding on the assumption that their meetings will be held the same as in former years, but the fact that the question is being raised in both organizations indicates that a definite statement from the American Railway Engineering Association will clarify the situation and remove any ground for doubt. While at first thought it might perhaps be considered unnecessary for the American Railway Engineering Association to complete its arrangements for this convention at this early date, the National Railway Appliances Association is dependent upon the action of the Engineering Association for its guidance and it is important for the Appliances Association to know definitely where it stands in order that it may safely proceed with the negotiations for its exhibit space and incur other heavy expenditures. Many of the supply companies are also desirous of undertaking the preparation of their exhibits in the near future.

There would seem to be no reason why the American Railway Engineering Association should consider any plan other than the holding of its annual convention at the regular time and place. This society has been formed for the consideration of problems in the engineering and maintenance of way departments and the standing which it now has is an indication of the high character of the work it has done. The unusual conditions which the railways are now facing have created new and difficult problems for the members of this association, second in severity to those in no other department of railway service. These problems have arisen so quickly that time has not been available for detailed individual study and solution, and united effort is more necessary than ever before. There is, therefore, vastly more reason for the holding of the convention this year than at any previous period since the organization of the association.

An early decision on this matter is also essential, for to be of the maximum value to the membership, the program for the meeting should be changed radically. Under the organization in effect in the American Railway Engineering Association, the time of the convention is devoted almost entirely to the consideration of reports presented by standing and special committees on subjects assigned to them a year previous. In ordinary times this is an excellent method of procedure. This year, however, conditions have changed greatly since the subjects were assigned to the committees. Some of the topics selected are of engineering value at any time but have no particular application to present-day problems, while some of the most complicated questions are not covered in any way in the work now being done by the committees. The Board of Direction of this Association should give this situation serious consideration at the earliest possible opportunity, and should so alter the program that the members will be given that information which will be of the greatest value to them at present. This might require the postponing of entire reports of some committees and of portions of the reports of others. While this would be contrary to past practice, precedents are of little or no value in times such as the present. The railways themselves have made many revolutionary changes in their methods to meet the conditions which have arisen during the past year and the American Railway Engineering Association can do as much. Consideration of subjects such as methods of determining subsidence in embankments or secondary stresses and impact in steel bridges may well be deferred in favor of discussions of the labor problems, the reclamation and conservation of materials, the development of labor saving equipment and the conservation of cars in handling company materials. Elementary as subjects such as these may seem to some, they are the ones which are requiring the attention of railway men today to the exclusion of many more highly technical questions.

Owing to the cumbersome nature of committee work and the limited time before the convention, it may not be advisable to endeavor to secure committee reports on these timely subjects but to arrange for their presentation as individual papers by specialists in the respective lines. The important feature is to bring the desired information to the members either through committee reports or individual papers. Because of the intensity of the present problems the committee in charge of the annual dinner might also well consider the advisability of substituting addresses by railway men on current railway problems at the annual dinner for addresses on other than engineering subjects, as has been customary in the past.

With a large attendance assured by action of the Engineering Association (the Railway Signal Association having already provided for the holding of its stated meeting at the discretion of the Board of Direction) the National Railway Appliances Association will have an opportunity to present a more valuable exhibit than ever before. While the purpose of this exhibit is to display the products of the manufacturers before railway men and thereby to promote trade, the value of the exhibit to the manufacturers depends directly upon the extent to which the materials exhibited are of service to the railways. The situation in the supply field at present is very unusual. Some firms, particularly those handling products of steel, are so congested with orders that they are unable to accept further business except for long-delayed deliveries. Others are not so fortunate (or unfortunate) and are actively soliciting orders. There is no question but that the present labor situation will cause many railway men to study the exhibits more than ever before, searching for devices which will replace men and aid them to tide over the existing situation. The present, therefore, offers an exceptional opportunity to a large number of railway supply manufacturers to display their devices.

In brief the convention of the American Railway Engineering Association should be held as usual, but the program

should be revised to concentrate on the problems of today. The National Railway Appliances Association should proceed with its exhibit and the individual manufacturers should be encouraged to present those products which will aid the railways in meeting their present problems. The Associations should make a definite statement regarding the holding of the convention, and the exhibit, at once so that there may be no further uncertainty.

HOW THE FARMER TAKES REGULATION OF HIS BUSINESS

A LARGE part of the farmers of the country have long regarded railway stockholders and railway managers as very selfish and unreasonable, and as wanting in a proper public spirit, because they have resisted efforts to regulate railway rates in ways that the railway stockholders and managers have regarded as unfair. Persons purporting to speak for the farmers, especially those of the middle west, such as Senator LaFollette of Wisconsin, Clifford Thorne of Iowa, and so on, have also vigorously criticized the spokesmen of the railways and their witnesses in rate cases, on the ground that these representatives of the railways have "doctored" their statistics to make them show that the expenses of the railways were larger and their profits smaller than they really were.

It is an old saying that human nature is the same the world over, and the fact that human nature on the farms and in railway offices is very much the same is being amusingly and significantly exemplified by the attitude that many farmers and persons who volunteer to speak for them are assuming toward government regulation of the price of wheat, and by charges that are being made regarding the way spokesmen for the agriculturists are making up their statistics as to the cost of wheat-growing and the profits farmers are deriving from it.

The railway owners and managers frankly didn't like it when the government began fixing their rates. Neither do the farmers relish the action of the government in fixing the price of wheat. Furthermore, the farmers, like the railways, are trying to show that they can't live and prosper on what the government will let them have—the main difference between the situations of the two classes being that the railways are now receiving as low average rates as they ever did in their history, while the farmers are receiving prices for wheat that are unprecedentedly high.

The Kansas City wheat conference held a short time ago reckoned that to produce wheat this year cost \$2.71 a bushel. This is a startling figure, in view of the fact that the price fixed by the government is only \$2.20. How was this startling figure arrived at? We are told that "into the cost of wheat was figured interest on seed wheat, interest on the oats fed the horses, interest on investment, taxes, depreciation of farm machinery, and many other entirely proper items." But the Topeka Capital, published by Arthur Capper, governor of Kansas, intimates that the "costs" were padded. For example, the average production of wheat was assumed to be nine bushels to the acre. But the Statistical Abstract of the United States for 1916, page 123, shows that since 1866-75 the average production in this country per acre has never been less than 11.9 bushels; that in 1912 it was 15.9 bushels; in 1913, 15.2 bushels; in 1914, 16.6 bushels; in 1915, 16.9 bushels, and in 1916, 12 bushels. Governor Capper's paper says that "on the basis of a 15-bu. crop, the government has guaranteed a profit of 42 cents a bushel, or 27 per cent net profit over cost." Prof. G. E. Call, of the State Agricultural College of Kansas, is quoted as saying that on the average the American farmer is receiving \$1.21 profit when wheat sells for \$2, and \$1.41 profit when the government price of \$2.20 is obtained.

There are many farmers, and many men in public office, or who want to get into public office, who have been, and still

are, quite willing to assert that railway rates are high enough or even too high, in spite of the enormous advances in taxes, wages and other railway expenses which have occurred while rates have stood still or declined. They also presume to assert that if the railways with present rates aren't making enough money, it's the fault of their own managements; that all they need is to increase the efficiency of their operations—a thing which we are assured it would be very easy to do.

The *Railway Age Gazette* is much more modest than these people. We think we do know something about the railway business, but we would not venture to estimate what it costs to grow a bushel of wheat, or what price the government ought to allow to be charged for it. We do think, however, that the modest reserve we show in expressing opinions about agriculture might well be followed in future by farmers and their spokesmen who don't know a bit more about the railway business than we do about the farming business. Furthermore, we beg to call attention to the fact that in 1913, before the war began, with its consequent advances in wages and expenses of all kinds, the average railway rate per ton per mile in this country was 7.29 mills, while in 1916 it dropped to 7.06 mills, the lowest point ever known. On the other hand, in 1913 the average farm value of wheat in this country was 80 cents a bushel, in 1916 it was \$1.60, while the price fixed by the government is \$2.20. Would it be impertinent to suggest that, if the railways are to be required, with only a small increase in rates in eastern territory, and almost none at all in the rest of the country, to so increase their efficiency as to absorb all their increases in expenses, the farmers might also be asked to so increase their efficiency as to manage to worry along with a more than 100 per cent increase in the price of wheat?

The farmers have been mainly responsible for the unreasonable, unfair and drastic regulation to which the railways of the United States have been subjected during the last 10 years. They are now, in a great national emergency, being given just a little taste of the same medicine which they and the politicians they have chosen to represent them have been compelling the railways to swallow in large quantities for years. The regulation of railway rates, for which the farmers are mainly responsible, was bound to be used as a precedent for extending similar regulation into other fields. The *Railway Age Gazette* repeatedly has pointed this out, but persons in other lines of business, and especially the farmers, couldn't see it. Really, our farmer friends should accept price-fixing more gracefully, for it is merely the logical and natural application to their own business of a system which they have insisted on applying to the railway business. Furthermore, why shouldn't they be compelled to accept a price for their wheat which will barely yield them a "fair return on the fair value of their property," making no allowance in valuing it for the "unearned increment" in their land, or for investment in improvements that has been made from earnings? LaFollette, Thorne and all the rest of that crowd of politicians would confiscate all the investment from earnings and all the so-called "unearned increment" in the property of the railways. Now that we have got to regulating farm prices, we should, of course, proceed consistently and equitably, and do by the farmer as he would have the railway stockholder done by!

In view of the manifest dissatisfaction of the farmers with government regulation of wheat prices, perhaps they will be able in future to understand a little better and to sympathize a little more readily with the attitude of railway managers and stockholders toward government regulation of railway rates. The farmers are discovering that when government regulation reaches *them* it doesn't seem so entirely wise, and just, and beneficent, after all. Perhaps they will not be so keen for regulating other people's property to the point of confiscation when they discover that "curses are like young chickens, and still come home to roost."

Letters to the Editor

FROM A VEGETARIAN POINT OF VIEW

WASHINGTON, D. C.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I have been impressed with your articles and editorials regarding food on dining cars, because in my travels principally on the Pennsylvania Railroad and the Southern Railway I have noticed what seems to me to be very small servings.

Perhaps my impressions are partially due to being a lacto-vegetarian. Meat eaters are more apt to slight the side dishes, giving particular attention to the main dish. Generally no two persons order the same, because appetites differ, but in the matter of essentials, such as bread and butter, toast, etc., the servings are niggardly. Breakfast foods, such as oatmeal, are served in unfairly small portions considering the cost of the material and the preparation of it. The Lackawanna plan of servings as shown by you recently affords opportunity for greater discrimination as to size of portions desired.

F. T. WHITTELEY.

UNNECESSARY TRANSFER OF LOADS

DENVER, Colo.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The loads of approximately 25,000 cars are transferred during each month throughout the United States to facilitate the repairing of defective cars. There is no doubt but that about half of these cars could be run safely to their destination with their defects and unloaded. As the matter now stands the receiving line is the judge as to whether or not the lading in the cars is to be unloaded, and inasmuch as the cost of transferring and the payment of the damage claim is made by the delivering line, it is of course natural for the receiving line to transfer the load whenever there is the slightest difficulty in making repairs, delays to the equipment being entirely overlooked.

We may figure that a car is held out of service about five or six days when its load is transferred, a great deal of the time being lost in switching the car to and from the repair track. This means that the railways lose the service of the car for six days. It would be a good plan, owing to the scarcity of equipment at the present time for the railways to agree to haul the cars which are received in bad order and which could be handled safely to their destination, at the rear of the train. There is no question but that the car shortage would be reduced by about 12,000 cars a month if this practice were followed. This number of cars would take care of a great many shipments. Instances have been found where loaded cars have traveled 1,000 miles in bad order, which upon arrival at an interchange point, about 40 or 50 miles from their destination, were held by the receiving line, request being made for authority to transfer the load so the receiving line would not be obliged to make the repairs.

It would appear that while cars are so badly needed on all lines, that the railroads should get together on this proposition and agree to run such equipment as is reasonably safe to handle. It would not only help the receiving line, but also the delivering line. Furthermore, it would save the receiving line the labor of transferring, and labor at the present time is about as scarce as the equipment.

WILLIAM HANSEN,
Chief Joint Inspector.

How the Railways Are Helping Win the War*

The Record of Their Achievements and the Efficiency They Are Showing Under Difficult Conditions

By R. H. Aishton

President, Chicago & North Western; Chairman, Central Department Sub-Committee, Railroads' War Board.

DURING the closing months of 1916 and the first quarter of the present year, the railroads were engaged in a tremendous struggle in their efforts satisfactorily to transport a traffic larger than any that they had ever before handled; a traffic which was not running in the usual channels of trade, but which was complicated by numerous unusual movements, both of munitions and supplies, and of fuel, coupled with one of the worst winters known to the railroad fraternity.

I think that the executives of the railroads had generally recognized that sooner or later the United States would actively enter the war, and that when that time came it would not only increase the very large amount of traffic to be handled, but would also add to the complexity of the railroads' problem in handling it.

They knew that on the railroads must fall the burden of promptly and satisfactorily handling the military traffic of the nation, to enable it to perform effectively its part in the war, and that to satisfactorily handle the military traffic would require the greatest co-operation between the railroads and the military authorities; also that any failure on the part of the railroads to handle the great commercial traffic would be disastrous to the industries and commerce of the country and would interfere seriously with the prosperity of the country and necessarily impair their effectiveness as concerns the carrying on of the war.

PROMPT ORGANIZATION OF THE RAILWAYS

War was declared on Germany on April 6. Five days later, on April 11, at a meeting of the chief executive officers of most of the important railways, in Washington, and at the suggestion of the Council of National Defense, an agreement of historical interest was entered into, and when the history of this war is written, it is hoped that this agreement will be given the place of prominence that it deserves, for in this agreement the railroads of the United States, great and small, 631 in number, acting through their chief executive officers there assembled, and stirred by a high sense of their opportunity to be of the greatest service to their country in the present national crisis, pledged themselves to do certain things. They "pledged themselves with the government of the United States; with the governments of the several states; and with one another; that during the present war they will co-ordinate their operations in a continental railway system, merging during such period all their merely individual and competitive activities in the effort to produce a maximum national transportation efficiency." To this end they agreed "to create an organization which shall have general authority to formulate in detail and from time to time a policy of operation of all or any of the railways, which policy when and as announced by such temporary organization, shall be accepted and earnestly made effective by the several managements of the individual railroad companies here represented."

By another resolution adopted at the same meeting, the railways agreed "to the direction of the executive committee in all matters to which its authority extends, as expressed in the resolution heretofore adopted."

For two years prior to this meeting, a committee had existed known as the Special Committee on National Defense

of the American Railway Association, formed primarily to co-operate with the government in the mobilization of troops on the Mexican border, and also to consider the general problem that would be presented in case we should become involved in the great war; but the activities of this committee were confined to co-operation in military affairs. What more natural, than at this meeting of the executives in Washington they should create an Executive Committee of this Special Committee on National Defense?

This was done, and five railway executives were nominated and elected, and it is this committee which has since become known as the Railroads' War Board.

A REVOLUTIONARY STEP IN RAILWAY HISTORY

This was probably the most important and revolutionary step ever taken in the history of our railways. By placing the operation of all of their facilities under the direction of a single committee of five, it constituted them to all intents and purposes for the period of the war, a single railway system. At the same time it placed the service of this great railway system unreservedly at the disposal of the government.

The railways of this country have one-third of the total railway mileage of the globe. They have a greater mileage than all of the railways in the world that are now owned and operated by governments. They have about 260,000 miles of lines; about two and one-half million freight cars; 56,000 passenger cars; and over 65,000 locomotives. They have 1,750,000 employees.

Therefore, by this act, this great railway system with all its facilities, was made to serve the government in this crisis as completely as if it had owned them; and at the same time the government was spared the expense of buying the roads and the responsibility and labor of managing them.

Perhaps the most significant feature of the matter was that this act on the part of the railways was purely voluntary. No law required it. Another of its very significant features was that the step was taken without any prospect of special consideration or compensation having been held out by the government. In England the railways have been united for operating purposes during the war into a single system, but there this action was required by law, and each railway was guaranteed the same net return that it had earned before the war began.

The individual companies composing our railway system, through the organization formed by themselves, placed their facilities at the service of the government without any understanding or promise that if this resulted in loss to any individual line, this loss would ever be made good.

HOW MILITARY TRANSPORTATION HAS BEEN CONDUCTED

The two great purposes in forming this organization were to enable the railways to meet promptly and satisfactorily all the military transportation needs of the government, and at the same time to so increase their efficiency that in spite of the large amount of military business they would be called upon to handle, they would be able satisfactorily to move the commercial traffic of the country. What success have the railways had in accomplishing these purposes?

In connection with the movement of military traffic, I believe that it might be said, that up to the present time the railways have been able to render a satisfactory service. Six-

*From an address before the St. Louis Railway Club, September 14, 1917.

teen military cities or cantonments have been built by the government to house the 687,000 citizen-soldiers selected for service by the draft. Colonel I. W. Littell was in charge of the construction of these cantonments for the United States government, and on September 5, 1917, Colonel Littell issued a statement regarding this work in which he said:

"In the construction of the cantonments to date, over 50,000 carloads of material have been transported to and delivered at the sites, an enormous tax upon the already overburdened railroads' facilities of the country. The railroads, however, have given splendid service. All government orders have been given precedence and the lumber and other supplies needed have been rushed to the cantonments in record time."

Of the 16 cantonments, seven were ready on September 5 to receive their entire quota of officers and enlisted men; seven others were ready to receive all their officers and two-thirds or more of their quota of enlisted men, while the two remaining ones already had received and were taking care of their full quota of officers. A typical layout such as is used for accommodating the officers and men at a cantonment comprises in round numbers 1,500 separate buildings, requiring approximately thirty million feet of lumber. Each cantonment has a complete system of water supply and sewerage disposal, the piping alone for this amounting to more than fifty miles. Besides moving the material and men for the construction of these cantonments, the railways have been moving vast quantities of other materials for government military purposes and also large bodies of troops.

They are now moving the 350,000 members of the National Guard to the training camps and between September 5 and September 9 they moved 35,000, or approximately 5 per cent of the men selected in the first call for the new National army. They will be called upon to move about 275,000 of these men beginning about September 19; and another 275,000 beginning October third. Another 100,000 will have to be moved beginning October 17. The government has been put to no serious delays or trouble in the handling of these large bodies of troops and with the experience we already have had, there is no reason for believing that it will encounter any in the handling of those who are yet to be moved.

IMPROVEMENT IN COMMERCIAL TRANSPORTATION RESULTS

It should be borne in mind in considering what this indicates as regards railroad efficiency, that the railways of the country are today handling both the largest commercial passenger traffic and the largest commercial freight traffic that they ever did in their history.

Have they, in spite of this, been successful in accomplishing the second purpose for which their present organization was formed; viz., that of so increasing the efficiency with which their existing facilities are utilized as to enable them satisfactorily to handle the commercial business of the country? You will recall that on May 1, less than a month after the railways began to operate under the present arrangement, the excess of requisitions for freight cars over what the railways could supply—the so-called "car shortage"—was 148,627 cars. Since that time, the total freight traffic handled has shown large increases. The railways handled 16 per cent more freight traffic in May, 1917, than they did in May, 1916, and 23 per cent more in June, 1917, than they did in June, 1916. This occurred in spite of the fact that the traffic in the year 1916 far exceeded any ever moved before. In spite of this phenomenal increase in freight traffic, the railways had succeeded on September 1 of the current year, in reducing the unfilled requisitions for freight cars about 80 per cent, or down to 31,591 cars. This remarkable result was partly due to the exercise of the power vested in the Commission on Car Service to order freight cars sent from places where they had accumulated in undue numbers to sections of the country where they could be used to better advantage. Between May 1 and August 30, the Commission on Car Service ordered 113,420 freight cars sent from certain railways to others; chiefly from Eastern lines to lines in the

West, Southwest and Southeast, where they were needed to move the huge quantities of lumber required for the construction of the cantonments, for the handling of crops, and so on.

It is believed that the continued exercise by the Commission on Car Service of its large authority will prevent in future such accumulations of cars at ports and in terminals as caused the great congestion of traffic over a year ago.

The success which has been attained in handling the enormously increased traffic, while actually reducing the unfilled car requisitions, has been mainly due, however, to increased efficiency on the part of the railways all over the country, and to the remarkable co-operation they have received from shippers in loading cars more heavily and in loading and unloading them more promptly. Statistics which have been compiled for railways having a total mileage of 196,000 miles show that in June, 1917, the railways handled 23 per cent more freight traffic than they did in June, 1916, with only 1.8 per cent more freight locomotives in service, and only 3.2 per cent more freight cars. This indicates, without doubt, an increase in the efficiency with which locomotives and cars are being handled, which certainly is highly creditable both to the managements of the railways and to the shipping public, who have co-operated with them so patriotically and loyally.

THE TREMENDOUS INCREASE IN FREIGHT TRAFFIC

Extremely few people have any conception of the magnitude of the problem with which the railway managements have been confronted by the enormous increases in traffic within the last two years. If more people understood this, there would be less criticism because there have been shortages of cars and more appreciation of the remarkable increases in railway efficiency which have been made, and which have had to be made in order to prevent the congestions and car shortages from becoming very much more serious. Let me give an illustration of the most striking kind regarding both the increase in freight traffic and the increase in the efficiency of operation which have had to be made in order to handle this increased traffic.

Our railways have only a very small number more miles of line, track, locomotives and cars than they had in the fiscal year which ended on June 30, 1915, two years ago. In the calendar year 1916, however, before the present organization for operating the railways as a single system was formed, they handled 31 per cent more ton miles of freight traffic, according to the best estimate that can be made, than they did in the fiscal year ending June 30, 1915; and at the present rate of increase it appears probable that in the calendar year 1917, they will handle at least 15 per cent more ton miles of freight than they did in the calendar year 1916. This will make an increase in the freight traffic handled in the calendar year 1917, as compared with the fiscal year ending June 30, 1915, of 141,000,000,000 ton miles, or 52 per cent. Stated thus baldly in statistics, this increase may not appear to you as very significant, but I will state it in terms which will make it more significant.

If, during the rest of the calendar year 1917 the railways of the United States handle a traffic relatively as much larger than that of the fiscal year ended on June 30, 1915, as that which they have thus far handled during the current year, the increase in freight traffic handled by them over that handled by them in the fiscal year 1915 will be greater than the total freight traffic moved annually before the war by the combined railways of Germany, France, Russia, Spain, Sweden, Switzerland, Roumania, Holland, Canada, South Africa, Mexico, Japan, Brazil and New South Wales. In other words, the railways of the fourteen countries I have mentioned handled before the war a total of 141,000,000,000 ton miles of freight a year, while in the year 1917 the increase in the freight traffic of our railways alone over that of the fiscal year 1915, will be about 141,000,000,000 ton miles.

These figures give some idea of how much more vast is the railway system of the United States than that of any other country, as well as of the increase in freight traffic which has occurred within the last two years, and of the increase in the efficiency of the operation of the railways in this country; for as I have observed heretofore, this tremendous increase in traffic is being handled with a relatively small increase in facilities.

Stated in tons instead of ton miles, the increase in traffic in the calendar year 1917 over the fiscal year 1915 probably will be close to 510,000,000 tons. On the basis of the number of tons now being handled per train, it would take 720,000 trains, containing 18,000,000 cars, to hold this increase in tonnage. If all of these cars were made up into a single train it would be 136,363 miles in length.

Is it any wonder, in view of such facts, that there have been, and probably will continue to be, some congestions and delays?

There are some people who use the evidence of recent increases in railway efficiency as a basis for criticizing our railways. They say that such figures show that the railways were inefficiently operated before, and that a corresponding increase in efficiency ought to have been accomplished before we entered the war. Those who are really familiar with railway affairs in this country know how utterly without foundation such criticisms are. In the first place, it is easy to demonstrate that the railways have been steadily increasing the efficiency of their operations. If they had not been, the advancing wages, prices and taxes to which they have been subjected, together with the kind of regulation of rates which they have had to bear, would long since have bankrupted most of them.

In the second place, they never had such an opportunity to increase the efficiency with which they use their facilities as they have had since this country entered the war. They have been allowed since then, to operate, in so far as they have found it expedient, as a single system, while before we entered the war, the railways were prevented from doing this by the Sherman law.

They have also been able, since we entered the war, to secure an amount of effective co-operation from all shippers, large and small, in the country, that they never were able to obtain before; and in this same connection, the helpful and co-operative efforts of a number of the public service commissions in the various states, which early realized the situation confronting the railways and the necessity for increasing their efficiency, and which have used tremendous influence with the shippers and the public to bring about the elimination of delays to equipment; proper loading of equipment; and all of the various things of that kind that tend to increase the railways' efficiency; and by the weight of their influence they have been most helpful to us.

Within the past few days, the Public Utilities Commission of Illinois called a meeting of the railroads to find out in what manner they could be of the most help; and as a result of that meeting during the last 48 hours they have given publicity to some of the most helpful ideas on this subject.

It is certainly the irony of fate that the increase in the railways' efficiency, which they are making for the purpose of serving the country, should be adopted by certain persons as a ground for criticizing them.

RAILWAYS WILL SUCCESSFULLY PERFORM THEIR TASK

When we have briefly reviewed what has already been done by the railways in the war, our minds naturally turn to a consideration of what they probably will be able to do in the future. From present indications, it seems probable that the demands made upon them by both military and commercial traffic will continue to increase for a considerable time.

They probably will be called upon to handle a heavier

traffic during the next fall and winter than they ever have been before. In some respects the difficulty of handling this traffic will increase.

One serious problem with which the roads are confronted is the labor problem. They have raised nine regiments of railway men for the government, which are to be used in connection with military transportation in France. Not a few of their competent officers have gone into the service of the government. A considerable number of their employees have been selected for the new national army; and as more men are selected, the number of railway men who will leave the service of the railways to enter that of the government will probably increase.

As a concrete example, on the railroad with which I am connected (the Chicago & North Western), with a system of about 9,000 miles, already 820 of our men have voluntarily enlisted in some branch of the government military service. Out of a total of approximately 40,000 employees, 15,000 registered for the new selected national army, and while it is true that a great many of them have dependents, or secure exemption for some other reason, at the same time this will illustrate to you one of the phases under which the railways are struggling.

The labor problem was acute before we entered the war, and it is probable that it will grow more serious as the war progresses.

The problem presented by the situation as respects the securing of materials and equipment is also serious. Materials and equipment of all kinds have greatly advanced in price, and it is difficult to get many kinds at any price. The result is that not only is the problem of moving the freight a very difficult one, but also the problem of maintaining roadway and equipment is a very difficult one.

In spite of all of these circumstances, it is my confident belief that the splendid spirit of the officers and employees of the railways of this country, manifested in so many helpful ways; the helpful and co-operative attitude of the public, and of the various commissions, both state and federal; the support of the press; coupled with the effective organization of the railways themselves, will successfully meet any task that may be set before them to perform.

To accomplish this, however, we must be able to continue and to increase the co-operation of the shipping public in connection with the increased loading of cars; expediting their movement, etc.; and to continue to maintain the active interest of the various public authorities and commissions; and to have tendered to us by our employees willingly, the most energetic and efficient work that they are capable of doing. To secure all of these things and to retain them when once secured is your task and mine and the task as well, of every railway officer the whole length and breadth of the United States. The railways at this time need more than ever the forbearance and co-operation of the general public and of the regulating authorities.

For the purpose of saving coal and also making as many employees available for freight service as practicable, the railways already have made reductions in their passenger service at a rate exceeding twenty million passenger train miles annually, and they may have to make still further large reductions later on. The managements are as reluctant to do this as the public is to have them do it, and they hope that the public will recognize it as a war measure, and will bear patiently the inconveniences which may result.

With loyal and energetic service from their employees, with continued effective co-operation from the shipping public; and with a public sentiment which will be intelligently sympathetic with what they are trying to do; I repeat again, that there is no good reason for doubting that the railways will be able to accomplish the great task which they have set before themselves; although it will not be accomplished without great effort and without great sacrifices on the part of

those connected with the railways and those who use railway service.

The emergency confronting the government and the nation is greater than any emergency that can confront any private individual or corporation; and we, representing the transportation interests of this country, must stand together and co-ordinate all of our activities to one end; the *early and successful termination of the war*.

The vast transportation interests of this country are, for this purpose, standing together and laboring uniformly for this common end, and it requires a powerful guiding hand to secure uniformity of action where so many interests are involved; and this hand has been, and will continue to be, wielded by the Railroads' War Board, until the nation so loved by us all has definitely and triumphantly attained the end of the voyage on which we are now embarked, viz., the making of the world safe for Democracy.

RAILWAY RETURNS FOR THE CALENDAR YEAR 1916

The Bureau of Railway Economics has issued a bulletin, No. 114, giving a summary of the principal railway statistics of Class 1 roads for the calendar year 1916. This is the third in a series of publications for the purpose of presenting as soon as possible after the close of the year the significant statistics of the more important railways compiled from their annual reports to the Interstate Commerce Commission. This is the first annual compilation of the bureau under the commission's order changing the fiscal year.

The Class 1 roads, those having gross earnings of over \$1,000,000 for the year, include approximately 89 per cent of the railway mileage of the country and 97 per cent of the operating revenues. Emphasis is laid in the introduction to the bulletin upon the fact that the figures are preliminary and in some cases liable to correction and adjustment. Comparisons with the preceding year are attempted only in the case of the income account because of the change of the fiscal year. No account is taken of intercorporate duplications arising out of the relations between the operating roads of Class 1 and the smaller operating roads and non-operating companies. An effort is made, however, to present an approximate statement of the property investment of Class 1 roads, including the investment of all non-operating subsidiaries whose properties are operated by the roads of Class 1. Using this figure as a basis, the operating income for the year represents a return of 6.38 per cent upon the investment.

An average operated mileage of 230,486 miles of line is represented in the statistics. The income account, with comparisons for the previous year, is as follows:

Item	Year ended December 31		Increase 1916 over 1915
	1916	1915	
Railway operating revenues.....	\$3,592,591,023	\$3,061,621,651	\$530,969,372
Railway operating expenses.....	2,354,548,724	2,053,364,924	301,183,800
Net operating revenues.....	1,238,042,299	1,008,256,727	229,785,572
Railway tax accruals.....	156,875,396	137,398,653	19,476,743
Uncollectible railway revenues.....	795,359	792,163	3,196
Railway operating income.....	1,080,371,544	870,065,917	210,305,623
Miscellaneous operating income.....	3,039,951	1,566,871	1,473,134
Total operating income.....	1,083,411,495	871,632,728	211,778,767
Non-operating income.....	270,042,627	230,733,050	39,309,627
Gross income.....	1,353,454,122	1,102,365,778	251,088,394
Deductions from gross income:			
Interest on unfunded debt.....	404,566,382	396,633,221	7,933,161
All other deductions.....	14,940,456	19,814,945	4,874,489
Total deductions.....	288,418,129	229,331,459	58,886,670
Net income.....	707,924,967	645,979,625	61,945,342
Disposition of net income:			
Dividend appropriations.....	187,884,557	176,599,800	11,284,757
Income appropriated for investment in physical property.....	62,507,009	31,742,204	30,764,805
Other income appropriations.....	35,122,052	12,904,834	22,217,218
Total appropriations of income.....	285,513,618	221,246,838	64,266,780
Balance to credit of profit and loss.....	360,015,587	235,139,315	124,876,272

d Decrease.

The total capital securities outstanding on December 31, 1916, not excluding duplications resulting from intercorpor-

ate relations, amounted to \$16,140,137,007, and the total property investment (estimated) amounted to \$16,974,809,871. The increase in the investment of Class 1 roads themselves during the year was \$365,468,359, of which \$39,939,000 was for new lines and extensions, \$322,394,000 for additions and betterments on owned lines and \$3,135,000 additions and betterments on leased lines. The equipment in service on June 30 included 60,945 steam locomotives, 322 other locomotives, 2,277,170 freight train cars, 52,145 passenger train cars, and 97,112 company service cars.

The number of general and division officers during the year was 17,366 and their total compensation was \$53,200,749. The total number of employees, excluding general and division officers, was 1,664,852 and their total compensation was \$1,348,773,274, an average of \$868.

In the following table are given some of the principal averages and ratios.

AVERAGES PER MILE OF LINE:

Operating revenues.....	\$15,587.00
Operating expenses.....	\$16,215.57
Net operating revenue.....	\$5,371.43
Taxes.....	\$686.01
Operating income.....	\$4,687.36
Freight revenue.....	\$11,097.44
Passenger revenue.....	\$3,063.73
Freight train-miles (freight train density).....	2,492
Passenger train-miles (passenger train density).....	2,676
Total revenue train-miles (train density).....	5,300
Total revenue locomotive-miles.....	7,452
Total freight car-miles (empty cars per train).....	100,857
Total passenger car-miles (cars per train).....	14,832
Revenue ton-miles (freight density).....	1,571,175
Revenue passenger-miles (passenger density).....	150,002

AVERAGE PER MILE OF MAIN TRACK:

Freight revenue.....	\$9,644.15
Passenger revenue.....	\$2,662.52
Passenger service train revenue.....	\$3,355.01

AVERAGE PER TRAIN-MILE:

Operating revenues.....	\$2.94
Operating expenses.....	\$1.93
Net operating revenue.....	\$1.01

AVERAGE PER FREIGHT TRAIN-MILE:

Freight revenue.....	\$3.96
Loaded freight car-miles (loaded car per train).....	25
Empty freight car-miles (empty cars per train).....	36
Total freight car-miles (cars per train).....	36
Revenue ton-miles (tons per car).....	560

AVERAGE PER PASSENGER TRAIN-MILE:

Passenger revenue.....	\$1.17
Passenger service train revenue.....	\$1.47
Passenger car-miles (cars per train).....	5.8
Revenue passenger-miles (passengers per train).....	57

AVERAGE PER FREIGHT CAR-MILE:

Revenue ton-miles (tons per loaded car).....	23
Revenue ton-miles (tons per car).....	16
Freight revenue—cents.....	16.13

AVERAGE PER PASSENGER CAR-MILE:

Revenue passenger-miles (passengers per car).....	16
Passenger revenue—cents.....	31.79

MISCELLANEOUS AVERAGES AND RATIOS:

Operating ratio (per cent).....	65.54
Average haul per ton—revenue freight—miles.....	166.73
Average journey per passenger—miles.....	34.37
Average receipts per ton-mile—cents.....	2.06
Average receipts per passenger-mile—cents.....	2.04
Average tractive power per locomotive—pounds.....	33,194
Average capacity per freight car—tons.....	41
Average seating capacity per passenger car—coaches only.....	68

a On the individual railway.

USE OF BRITISH CANALS URGED.—In a letter to various local authorities the Canal Control Committee of England urges the use by manufacturers, merchants, exporters and importers of the inland waterways of the country for the conveyance of all kinds of traffic which can be so carried, in view of the fact that the railways are so severely taxed through depletions of staff for the army, while they have to deal with an increased volume of traffic. The committee states that the necessity of affording them relief by such diversion is urgent. To assist it the committee has appointed three sub-committees—the Northern, Midland and Southern—with offices at Leeds, Birmingham and London, respectively, which will each, with an independent chairman, be composed of representatives of canal companies and of carriers, in addition to official representatives of the War Office, Ministry of Munitions and Railway Executive Committee. These committees will exercise control over the canals in their districts.

A Successful Campaign on Claim Reduction

A Description of Methods Adopted by the Santa Fe to Decrease These Payments and of the Results Secured

By Charles E. Parks

Assistant Editor, The Santa Fe Magazine, Chicago.



Four Stages in the Proper Stowing of L. C. L. Freight

PREVIOUS to 1908, the Atchison, Topeka & Santa Fe, in common with most of the other railroads of the United States, had made no centralized or systematic effort to reduce the payment of claims growing out of loss and damage to freight. All attempts in this direction had been of a personal nature, depending upon the ambition of an officer to make a showing relative to the amount of the claim payments in his territory. When a reduction was brought about, this result could be traced to a number of reasons,

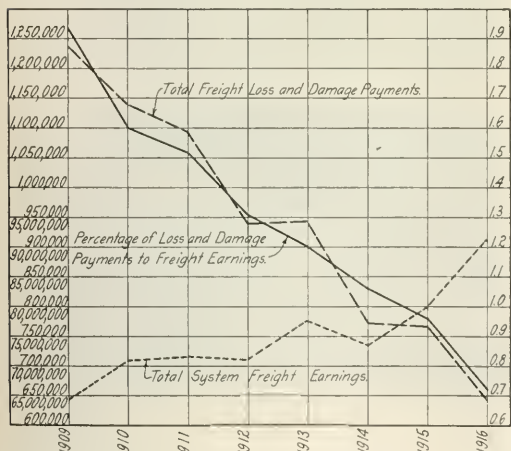
business; inadequate facilities, both terminals and rolling stock; increased hazards due to longer and heavier trains; the rapid deterioration of equipment, and the lack of co-operation on the part of shippers and connections in the work of prevention.

Freight claim payments had shown a steady and persistent growth year after year, the percentage of increase usually being in excess of the normal percentage of increase in freight revenue. In 1908 these payments reached the high total of \$1,565,434, or 2.53 per cent of the gross freight revenue of the company. This figure represented the high water mark of freight claim payments on the Santa Fe. However, it was no better or no worse than what other roads were paying in proportion to the amount of freight revenue earned. It was due to no extraordinary causes, but merely indicated the waste resulting from the hazards of transportation when no organized attempt was made to reduce these hazards to the lowest possible minimum.

Confronted with this large total and the indications of heavier future payments, the Santa Fe undertook to remedy conditions, and in 1909 made its first systematic study of the loss and damage problem. In September of that year a loss and damage committee was organized composed of representatives of every department of the road, whose duties were first, to locate the cause of the loss and damage, and second, to devise means of prevention.

Since its organization this committee has waged relentless warfare on loss and damage to freight, and its activities have gradually been extended to cover losses and damages of all kinds—personal injuries, loss and damage to baggage, damage to property and damage to stock on the right-of-way. As the prevention of loss and damage is the most important negative element in transportation efficiency and involves the discussion of practically every phase of railroad operation, the semi-annual meetings of the system loss and damage committee have come to be regarded as a sort of general system information meetings, where any question pertaining to the general efficiency of the road might be discussed, either formally or informally, among officials and employees.

How fruitful of results the work of this loss and damage committee has been may be judged from the following figures, showing the gross freight earnings, the payments for loss and



Freight Earnings, Loss and Damage Payments and Relations of Payments to Earnings

but the principal one was not always the attempts made to eliminate the real causes for loss and damage. These causes were numerous, but chief among them was the failure of officers and employees to take cognizance of the seriousness of the situation with the resultant lack of harmony and efficiency. Other contributing causes were the increase in

damage to freight and the percentage of freight claim payments to freight earnings for the past nine years:

Year	Gross Freight Earnings	Payments for Loss and Damage to Freight	Percentage of Freight Earnings
1908	\$61,848,638	\$1,565,434	2.53
1909	64,212,638	1,234,564	1.92
1910	71,194,055	1,141,014	1.60
1911	71,787,200	1,091,435	1.52
1912	71,529,574	939,676	1.31
1913	78,190,922	942,838	1.21
1914	73,638,388	772,300	1.05
1915	80,504,000	771,764	.96
1916	91,432,429	649,180	.71

Notwithstanding the great increase in gross freight earnings, the percentage of freight claim payments to freight revenue has shown a steady decline, while the total amount of claim payments has been reduced nearly two-thirds. For every dollar of freight revenue earned in 1908, the Santa Fe returned 2.58 cents to the shippers in payments for claims for loss and damage; last year the company returned but 0.71 cents, which is a remarkable showing in view of the great increase in freight business. The curves show graphically what this means.

The following table gives a comparison of the Santa Fe loss and damage payments and the ratio of claim payments to gross freight revenue with the claim payments of the other important roads operating in the same or similar territory for the year ending June 30, 1916:

	Freight Revenue	Freight Loss and Damage	Percentage of Freight Earnings
Santa Fe	\$91,432,429	\$649,180	.71
Foreign Line No. 1	32,287,854	302,223	.94
Foreign Line No. 2	48,370,000	525,134	1.15
Foreign Line No. 3	72,000,000	895,000	1.24
Foreign Line No. 4	60,353,399	864,988	1.40
Foreign Line No. 5	50,921,932	879,294	1.73
Foreign Line No. 6	21,697,723	377,406	1.60

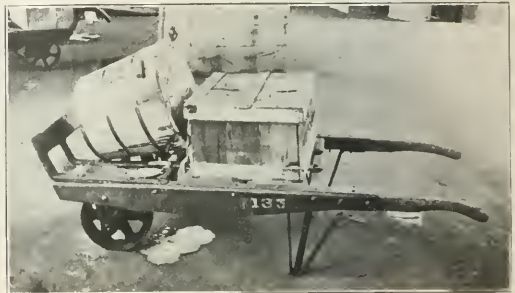
The following table shows the decrease in claim payments for 1916, as compared with 1915, classified in respect to the commodities shipped:

Commodity	1916	1915	Decrease
Agricultural implements	\$5,026	\$5,446	\$420
Boots and shoes	11,452	11,019	*433
Batter	984	946	*38
Candy	2,135	2,157	.22
Castings	1,269	2,047	778
Canned goods	6,494	6,542	.48
Clothing	14,887	19,527	5,240
Coal	5,816	5,672	*144
Cotton	2,715	4,268	1,553
Cotton seed and products	1,733	2,492	759
Crackers	721	886	165
Crockery	4,154	3,682	*472
Dairy products	1,077	1,504	427
Eggs	9,532	10,069	537
Dry goods, notions, etc.	11,974	14,535	2,556
Cigars	1,196	1,885	689
Flour	10,970	14,075	3,105
Wheat	32,319	59,611	27,292
Corn	4,915	10,236	5,321
Other grain	8,959	8,175	*784
Mill products	5,093	6,844	1,751
Dried fruit	7,395	5,529	*1,866
Furniture	30,481	33,528	3,047
Glass and glassware	11,599	11,909	310
Plate glass	3,781	2,181	*1,600
Hardware	8,618	7,213	*1,405
Stoves	8,034	8,852	818
Household goods, etc.	25,180	26,538	1,358
Fruit jars	916	405	*511
Lumber	4,700	5,957	1,257
Machinery	13,847	13,662	*185
Oils	16,794	19,040	2,246
Paper	3,151	3,919	768
Sewer pipe	4,006	3,297	*709
Potatoes	15,161	11,931	*3,230
Citrus fruit	16,927	60,067	3,140
Deciduous fruit	27,464	24,321	*3,143
Packing house products	6,337	13,001	6,664
Fresh meat	2,414	3,263	849
Vegetables	11,166	11,896	730
Other perishable freight	15,630	18,460	2,830
Sugar	14,594	9,499	*5,095
Tobacco	3,276	4,205	476
Vehicles	15,340	13,156	*2,184
Other dead freight unclassified	92,162	124,586	32,424
Wines and liquors	10,430	17,957	7,527
Live stock	103,361	118,411	14,550
Total	\$656,543	\$764,401	\$107,858
Balance in fund established March, 1915, for settlement of wheat claims		7,363	
Credit for above amount used in 1916	7,363 Cr.		
Grand total	\$649,180	\$771,764	\$122,584

* Increase.

That this showing is due to the work of the loss and damage committee cannot be denied in view of the persistent and uniform rate of decline. As shown in the curve, there has been no fluctuation. As the ratio of loss and damage payments to freight earnings is well below the one per cent mark, it is realized that the reduction must cease and may even show a slight increase owing to conditions over which the company has very little control, particularly in respect to interline shipments, but it is the ambition of the committee to keep the ratio below the one per cent line.

When the committee first began its investigations it was not difficult to determine the various causes of loss and



Leaky Lard Bucket Caused by Carelessness of a Trucker

damage to freight, but it was not so easy to arrive at conclusions as to remedies and the most effective methods of their application. Some of the evils were of long standing and were not chargeable directly to the carriers. It was soon realized, however, that in order to reduce the waste it was necessary to secure the co-operation of the employees in order to improve (1), the checking and forwarding of freight at forwarding points and transfer stations; (2), the handling of freight in transit in trains; (3), the checking and delivering of freight at destination; (4), the preparation of cars for the transportation of certain commodities such as bulk grain, flour, sugar and perishable freight. It was also apparent that



An Outbound House with Systematic Arrangement of Freight

the co-operation of the shippers must be secured in furnishing a better grade of package and improved methods of marking and packing shipments, which would insure the articles arriving at destinations in good condition if handled properly by the carriers. As the work of the committee advanced, it also was found necessary to obtain the co-operation of the other roads in the proper handling of interline traffic. This is the plan of action which has been followed persistently from the beginning with the results above indicated.

Through its system of reporting loss and damage to freight the cause of such loss or damage is located with comparative ease immediately when it is discovered. At the end of each year a tabulated form of these causes is rendered with the amount of money expended for claims arising from the various causes distributed to each. With this table it is no difficult matter to trace and remedy as far as possible the conditions which cause the loss or damage.

The following table shows the causes of the loss and damage on the Santa Fe for 1916, with the amount expended for each cause and the increase or decrease over the preceding year:

Causes	DAMAGE		Decrease
	1916	1915	
Wrecks	\$29,235	\$30,555	\$1,320
Delays	44,337	51,289	6,952
Defective equipment—leaky roof, etc.	25,470	32,521	7,051
Freezing	33,826	30,706	*3,120
Transferring carload freight	1,258	3,320	2,062
Unit and nuclear cars	10,203	7,360	*2,843
Fires in excess of insurance collected	4,229	7,688	3,459
Improper refrigeration and ventilation	10,642	13,304	2,662
Concealed damage	36,072	35,768	*304
Other causes except carelessness	392,257	329,989	37,732
Total damage	\$487,529	\$542,500	\$54,971



Lading Well Broken Down Preparatory to Sealing Car

Loss			
Loss of entire package	\$51,112	\$62,379	\$11,267
Loss from package	13,366	14,826	1,460
Loss from bulk shipment	41,804	71,786	29,982
Concealed loss	13,415	15,743	2,328
Theft	10,998	15,200	4,202
Other causes except carelessness	1,295	634	*661
Carelessness of employees	37,004	41,333	4,309
Total loss	\$169,014	\$221,901	\$52,887
Total loss and damage	\$656,543	\$764,401	\$107,858
Balance in fund established March, 1915, for settlement of wheat claims		7,363	.....
Credit for above amount used in 1916	7,363		.....
Grand total	\$649,180	\$771,764	\$122,584

* Indicates increase.

To secure the co-operation of employees and accomplish the first four requisites in the campaign, it was necessary to make them realize the gravity of the situation and then remedy it. The efficiency of the work of handling freight must be increased. The necessary interest in the work was secured by a wide campaign of publicity among the employees. Posters, cartoons, bulletins and illustrated pamphlets showing all the phases of the loss and damage situation—the results of improper loading, packing, marking and stowing; the evils of carelessness, negligence and indifference, pointing out the remedy and appealing to the employees' sense of duty—were used.

The offices of transportation and switching inspector were created, whose duties are to supervise the loading and stowing of freight, the handling of cars, switching movements,

etc., and to educate employees along these lines. Much also was accomplished through local conferences. Every general superintendent has a local loss and damage committee for his territory which meets every six months between the regular semi-annual meetings of the system committee for the consideration of loss and damage matters. In addition to this, attention was given the subject at the monthly division and information meetings, which are held at each division point and are attended by all division officers and by many employees whose duties will permit.

By these means the seriousness of the loss and damage situation was brought home to every employee and each individual was made to realize his own responsibility and the value of working harmoniously with his associates. Once his interest was aroused the task of applying the remedies recommended by the committee was made easy.

The co-operation of shippers has been secured in different ways—by correspondence, by personal solicitation and by agitating the subject in shippers' organizations. This co-operation consists in the main in the proper marking and packing of freight, and in the case of carloads, the proper loading, storing and bracing. Before approaching the shippers a study was made of ways and means of interesting them in the matter. It was realized that the best results could not be obtained altogether through criticism of shippers' methods of packing, loading and storing freight, but that the company must show a disposition to meet them half way. It was also realized that the economy in the material used by them in packing their products must be considered. So, when a shipper was approached with a complaint, it was done in a friendly way, but with convincing evidence of the incompetency in hand, showing wherein both he and his customer were suffering loss because of loose methods of shipping freight. This method usually brought about a speedy remedy.

The company also approached some shippers from a different angle. Letters of commendation were written to those deserving of such recognition for their effort to load freight properly and use competent containers. The results of this method of approach have been most gratifying, so much so, that the operating department has incorporated this mode of procedure as a part of the every-day work in cause and prevention. However, special precaution is always taken to avoid the possible error of commending an unsafe package, in the same manner care is taken to avoid criticism for frail or improper package unless it is warranted. The committee also has taken up with manufacturers of containers the questions of their merits and defects. By evincing a spirit of fairness and helpfulness towards them, these manufacturers have indicated a willingness to consider any criticism that might be offered from time to time.

Reduction of loss and damage on interline traffic can be secured only through the co-operation of other roads. The Santa Fe undertook to secure this co-operation, first, by learning of the methods adopted by foreign lines with a view of appropriating such as were beneficial; second, by investigating their attitude towards the loss and damage movement and the extent to which their work had progressed, and third, by influencing those that neglected loss and damage prevention to do their part. With these ends in view the loss and damage committee made a thorough canvass of 119 of the leading railroads. The following summary shows the extent of the work of loss and damage prevention on the roads canvassed:

Roads active in claim prevention	72
Roads semi-active	31
Roads non-active	16
Total	119

While the Santa Fe was the pioneer in this work, this canvass developed many important means of lessening claims for loss and damage which theretofore had not been used by the

company. The Santa Fe promptly put into operation such practices as were found advisable.

As long as a large percentage of claims are prorated with foreign lines, maximum results in claim prevention cannot be attained unless the other roads are equally interested and take the same or similar precautions to prevent loss and damage. The further the Santa Fe has gone into the work, the truer this statement has been found to be and the more it feels the need for real and active co-operation on the part of every carrier. A large percentage of the Santa Fe claim payments are now on interline shipments and it is realized that if the ratio of claim payments to freight earnings is to be further reduced or even maintained at the present figure, much of the work of prevention must be done by foreign lines.

Individual cases too often carry the idea that there is no complete harmony of ideas on the work of claim prevention and unfortunately some lines have not been convinced that the Santa Fe loss and damage movement has not been undertaken at the expense of connections. Texas lines in recent years have been burdened with excessive claim payments and the lack of harmony among themselves often retarded the efforts of any one line towards a betterment. However, it is the aim of the Santa Fe loss and damage committee to complete its canvass of every railroad in the United States of any consequence with a view to influencing greater activity on the part of railroads that are semi-active or inactive in this work to "do their part."

At present gratifying progress is being made. If a similar canvass had been made three or four years ago a much larger percentage of the roads would have been included in the non-active column and each year witnesses the roll of delinquents gradually lessening. To these roads the Santa Fe appeals directly or through the various railroad organizations, confronting them with the duty they owe their connections as well as themselves. Formation of claim conferences, particularly in Texas and on the Pacific Coast, also has brought about some satisfactory results. So far as the loss and damage of freight is concerned, it is the opinion of the majority

important sub-committees for the past year is given below:

Loading, Stowing and Bracing Freight—A book of rules governing the loading, stowing and bracing of freight has been prepared by the sub-committee for the guidance of men who have in charge the direct handling of freight. This rule book is made up of drawings, illustrations and text relative to the subject and will soon be promulgated. The rules and regulations are in line with the recommended practices of the American Railway Association.

To determine the most practical methods of loading, stowing and bracing the various commodities classified as L. C. L. freight, special investigations and tests were made. All incoming cars received at representative large distributing

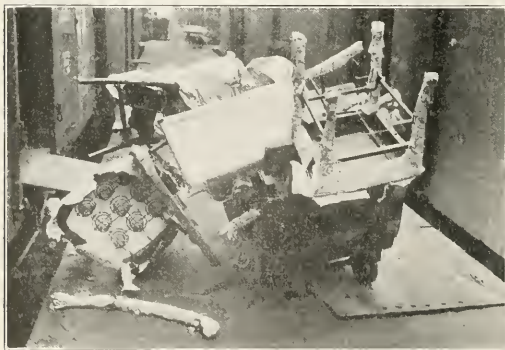


Using Condemned Grain Doors to Protect Freight

points were inspected during a period of 30 days. Present practices of stowing and bracing different commodities were studied and proved effective, or improved upon by a series of progressive impact tests under actual switching conditions. The commodities selected for the test were those most liable to damage themselves or to inflict damage to adjacent lading if shifted or overturned. They included barbed wire, jacketed cans, pianos, radiators, range boilers, rolls of wire and cable, safes, sewing machines, sheet iron roofing and tombstones.

The tests were conducted by switching the cars at varying speeds and under conditions subjecting the loaded commodities to the most severe conditions possible, the impacts at the higher speeds representing practically wreck conditions. After each impact the braced commodity under test was examined and changes made to overcome the weak points in the bracing. Photographic records were made of the various methods of bracing employed both before and after impact. The speed of the cars at the time of impact was determined by a stop-watch, recording the time necessary for the cars to travel a measured distance.

Loading, Stowing and Bracing Furniture—Furniture is one of the most troublesome commodities dealt with by the claim department, claim payments showing a tendency to increase each year. For the six months period ending December 31, 1916, the increase in payments for loss and damage to furniture in carload lots over the preceding six months was 0.3 per cent, while the L. C. L. shipments increased 30 per cent. A very careful analysis of the largest distributing and shipping points on the system was made in an attempt to arrive at causes and remedies, and it was found that a great many shipments were arriving at destination properly stowed but were found to be in a damaged condition either before or after delivery, indicating the possibility of damage at the time received or loaded. To prevent this inspectors were placed at the principal shipping points whose duties



Furniture Damaged by a Defective Platform

that the time has come to join forces in a nation-wide movement to prevent it.

The details of the work of the general system loss and damage committee of the Santa Fe is done by various standing and special committees charged with special duties. The system committee meets twice a year with an attendance of from 150 to 200 delegates for the purpose of reviewing the work of the sub-committees, advising them and promoting a general interest in the subject. As indicative of the manner in which the work is done and the results accomplished, a brief summary of the activities of a few of the most

were to inspect as many shipments as possible before accepting. At one station 1,200 shipments were inspected during a two-months' period with the following results:

Loaded O. K., and checking same at destination.....	921
Loaded damaged, checking same at destination.....	97
Loaded O. K., checked damaged.....	16
Loaded damaged with additional damage at destination.....	11
Loaded O. K., transferred in transit O. K., but checked damaged at destination.....	7
Shipments tendered but which inspector found to be damaged and refused to accept without damage notation which shipper would not accept and shipments were returned for repairs.....	64
Total.....	1,116

It was found that some of the shipments that had been refused had been repacked in a different manner and ten-



Floor of a Local Freight House Showing Indiscriminate Piling of Freight

dered again the following day or later. One damaged shipment was tendered by a very large firm on three different occasions.

Besides the employment of inspectors other remedies have been put in force, including a very thorough investigation of every furniture O. S. & D. claim. The results of these investigations are made known to the sub-committee, particularly if anything new is developed. Employees also have been urged to eliminate rough handling of cars containing furniture; to prevent unnecessary handling in break-bulk cars by loading the L. C. L. shipments in station order whenever practicable and to make a more rigid inspection at receiving stations as to the proper loading, stowing and general handling.

Making and Breaking Trains at Terminals.—Much of the work of the sub-committee covering this subject is carried on by correspondence with a view of eliminating the switching of all through cars at division terminals. To effect this, stress is laid on the proper makeup of trains—placing cars for various destination in certain locations in the train. Transportation inspectors see that no unnecessary or rough switching is being done.

Loss of Entire Package.—This is the largest single item of loss which the company has to contend with, being 7.9 per cent of the total payments made during 1916. While a considerable reduction has been made in the total amount of payments covering this item during the past five years, its percentage to the total claims paid has remained practically stationary, as the following figures will indicate:

Year	Payments	Per Cent of Total
1912.....	\$72,792	7.7
1913.....	87,678	9.3
1914.....	69,054	8.9
1915.....	62,379	8.1
1916.....	51,112	7.9

It is the prevailing opinion that the loss of entire packages is not due to theft by employees but to laxity on the part of check clerks in receipting, the company failing to receive the shipment receipted for. Surprise tests have been conducted from time to time in an attempt to locate the responsibility for the loss, but only a negligible number of the

packages failed to reach their destination, which indicated that check clerks were giving receipts for packages that were not delivered. Lack of proper supervision after the freight is delivered also is a contributing factor. On account of the large amount involved due to the loss of entire packages the loss and damage committee has investigated this subject very closely and has made numerous recommendations of the most minute details of handling L. C. L. shipments. Constant vigilance on the part of employees is especially urged.

Eggs.—Seventy-five per cent of the damage to eggs occurs in carload lots and such breakage as occurs in transit is due to improper bracing and the consequent shifting of the packages. The committee has recommended the closest practicable supervision to insure the use of standard packages, fillers and packing and the proper loading, stowing and bracing of carload as well as L. C. L. shipments. Several approved plans of loading are in use at nearly all shipping points, and these have the hearty approval of shippers.

Cooperage.—The general practice of stripping side doors of cars loaded with flour and similar commodities has been discontinued on the Santa Fe and such precautions are taken only in case the doors are not rain tight. During the year ending June 30, 1916, claim payments on flour and other mill products averaged only 29 cents per car. Claim payments on grain were considerably higher, being 70 cents per car. As the carriers main reliance must be on the adequacy of its inspection of the equipment both as to the quality of the car and the cooperage material, a rigid inspection of cars used to haul grain is being maintained by the company. This not only includes ordinary inspection before loading, but various special inspections at certain specified points. Acknowledgment from the consignee of the condition of the



Bracing Pianos in Place with Cleats and Wire

car is required at the time of delivery. Efficiency tests for discrepancies, particularly in weights, are often conducted and such tests have proved of considerable benefit.

Live Stock.—Loss and damage to live stock is the largest commodity item of loss and damage incurred by the Santa Fe, being approximately 16 per cent of the total payments. In 1916 the percentage of claim payments to live stock revenue was 2.2 per cent. Although this ratio is much larger than the average ratio of claim payments to freight revenue, it compares very favorably with the records of other live stock

carriers, being bettered by only one other road. The following table shows the amounts expended by the company for loss and damage to live stock during the past seven years:

Year	Live Stock Payments	Year	Live Stock Payments
1910.....	\$277,964.06	1914.....	\$137,503.34
1911.....	348,852.73	1915.....	118,411.14
1912.....	190,006.14	1916.....	103,860.66
1913.....	169,662.44	1917.....	110,535.00

This is an unusual showing, especially when it is considered that the average claim payment per car in 1917 was \$0.46, while in 1910 it was \$2.93, and that the company handled nearly twice as many cars of live stock in 1917 as in 1910.

The heaviest items of loss and damage are chargeable to delay and unlocated damage, 50 per cent of the claim payments being chargeable to the latter. This is the result principally of inherent weaknesses causing the stock to die in transit. The Santa Fe handles more of the weak, emaciated cattle of the South and Southwest than any other road. Claim payments on this account can only be avoided by the maintenance of proper records at the time of shipment as to the physical condition and treatment to which the stock was subjected prior to loading. A very close inspection of equipment before loading also is necessary. In reducing claims on live stock the co-operation of employees is the most essential factor and the great reduction the company has made can be attributed largely to the fact that this co-operation has been secured. The Santa Fe incurs law suits only when such course is necessary to avoid payment of improper claims.

In addition to the above matters other subjects were investigated by the sub-committees of the loss and damage committee during the past year. Chief among them were the following:

O. S. & D. reports.

Modernized plans of freight house construction.

Collection and distribution of data relative to loss and damage.

Mechanical matters which have any relation to the proper handling of freight—defective equipment, inspection, repairs, the different types of cars, their use and abuse, their advantages and disadvantages.

Handling of special commodities—explosives, newsprint paper, automobiles, cotton, etc. Transportation inspectors are required to specialize on certain commodities and submit their findings to the committee.

Freight Claim Association rules and regulations.

Pomeron bill of lading law.

Numbering agricultural implements.

Diversion failures.

Necessity of through billing on interline shipments.

Killing live stock on the right of way.

Increased car loading.

Baggage.

Personal injuries and safety matters.

The broad scope of the system loss and damage committee is evident, but the work of investigation and applying remedies is done by sub-committees. It is carried on energetically to a conclusion and the system committee merely advises and passes on the work accomplished. The efficiency of this mode of procedure is responsible largely for the excellent results in reducing loss and damage claims on the Santa Fe.

LOCOMOTIVE INSPECTION RULES MODIFIED DURING WAR

The Interstate Commerce Commission on September 20 issued an order at the request of the carriers, making modifications, for the period of the war, in certain of the rules and instructions for the inspection and testing of steam locomotives and tenders. The order is as follows:

"Whereas, at a conference held in the office of the chief inspector of locomotives on September 5 and 6, 1917, to consider modifications of the rules and instructions for the inspection and testing of locomotives and tenders and their appurtenances, which were prepared jointly by the mechanical advisory sub-committee of the American Railway Association's Special Committee on Relation of Railway Operation to Legislation and the sub-committee on military equipment

standards, Special Committee on National Defense, American Railway Association, and proposed by the committee representing the carriers, on account of the present international crisis, certain modifications were agreed upon by the representatives of the carriers, the representatives of the employees and the chief inspector; therefore,

"It is ordered, That effective at once and to continue in force during the period of the war, except where otherwise specifically stated, rules 2, 10, 16, 23, 110, 112 (b), 128 (d), 142 (c) and 150 (a) shall be modified as follows, except where conditions are such that the safety of operation is adversely affected thereby:

Rule 2.—The lowest factor of safety for locomotive boilers which were in service or under construction prior to January 1, 1912, shall be 3.25.

"Effective six months after the close of the war the lowest factor of safety shall be 3.5.

"The dates on which factors of safety from 3.5 to 4, as provided in rule 2, become effective, shall be advanced for a period equivalent to the duration of the war.

Rule 10: Flues to be removed.—All flues of boilers in service, except as otherwise provided, shall be removed at least once every four years, and a thorough examination shall be made of the entire interior of the boiler. After flues are taken out the inside of the boiler must have the scale removed and be thoroughly cleaned. This period for the removal of flues may be extended upon application if an investigation shows that conditions warrant it.

Rule 16.—The date for removal of lagging for the purpose of inspecting the exterior of locomotive boilers as provided by rule 16, except where indication of leaks exist, shall be advanced for a period equivalent to the duration of the war.

Rule 23.—Method of testing flexible staybolts with caps.—All flexible staybolts having caps over the outer ends shall have the caps removed at least once every two years and also whenever the United States inspector or the railroad company's inspector considers the removal desirable in order to thoroughly inspect the staybolts.

"The firebox sheets should be examined carefully at least once a month to detect any bulging or indications of broken staybolts. Each time a hydrostatic test is applied the hammer test required by rules 21 and 22 shall be made while the boiler is under hydrostatic pressure not less than the allowed working pressure, and proper notation of such test made on form No. 3.

Rule 110.—Time of cleaning.—Distributing or control valves, reducing valves, triple valves, straight-air double-check valves, and dirt collectors shall be cleaned as often as conditions require to maintain them in a safe and suitable condition for service, but not less frequently than once each six months.

Add to Rule 112.—On E. T. or similar equipment where the brake cylinder pressure is maintained regardless of piston travel the maximum piston travel for driving wheel brakes shall be 8 in.

Rule 128 (d).—Locomotives in road service.—The total amount of side motion of rods on crank pins shall not exceed $\frac{1}{4}$ in.

Locomotives in yard service.—The total amount of side motion of rods on crank pins shall not exceed $\frac{5}{16}$ in.

Rule 142 (c).—Top leaf broken or leaves in top half or any three leaves in spring broken. (The long side of spring to be considered the top).

Rule 150 (a).—The minimum height of flange for driving and trailing wheel tires, measured from tread, shall be 1 in. for locomotives used in road service, except that on locomotives where construction will not permit the full height of flange on all drivers the minimum height of flange on one pair of driving wheels may be $\frac{5}{8}$ in."

Factors in Locomotive Smoke Abatement*

How Smoke is Formed and How Brick Arches Reduce It; Ample Combustion Space and Flameway Needed

By J. T. Anthony

THE Master Mechanics' Association Proceedings for 1913 contain the report of the Smoke Committee appointed by the General Managers' Association of Chicago, which states that "while running, the brick arch is capable of making a 50 per cent reduction in smoke, irrespective of steam jets."

The tests upon which this statement was based were run with Penn gas coal of the following composition:

Fixed carbon	57.74 per cent
Volatile matter	34.07 per cent
Moisture	1.05 per cent
Ash	7.14 per cent
B.t.u. per pound of dry coal.....	14,539

The smoke reduction of 50 per cent was accompanied by an increase in evaporation of 8.6 per cent, due to the arch.

The Chicago Smoke Commission, of which Dean Goss was chief engineer, made extensive tests with and without the arch. They found that the brick arch decreases the average density of visible smoke emissions 33 per cent; decreases the total average quantity of cinders and fuel dust emitted in smoke 25 per cent; decreases the amount of carbon contained in cinders and fuel dust per ton of coal consumed 24 per cent; decreases the amount of ash contained in cinders and fuel dust per ton of coal consumed 28 per cent; decreases the volume of air intermingled with gases of combustion discharged through the stack 15 per cent; increases the volume of CO₂ discharged through the stack 6 per cent; decreases the volume of CO discharged through the stack 10 per cent, and increases the evaporation per pound of coal 7 per cent. These tests were run with coal from Macoupin County, Illinois, of the following composition:

Fixed carbon	37.47 per cent
Volatile matter	38.41 per cent
Moisture	9.89 per cent
Ash	12.23 per cent
B.t.u. per pound of dry coal.....	12,584

Both of the above tests were run with an 0-6-0 type switching locomotive, with a narrow firebox 40 in. wide by 106 in. long, with 29 sq. ft. of grate area. The air inlet through the ashpan was 5.7 sq. ft., or 20 per cent of the grate area. The arch was 66 in. long and was supported on two arch tubes.

The final conclusions of the above test report also stat that "the presence of the brick arch in the locomotive firebox increases efficiency and decreases fuel consumption, decreases the loss of heat units in smoke and ash discharged and reduces the visible smoke.

"The use of incorrect methods of firing, as indicated by the results of tests in which inexperienced firemen were employed, reduces efficiency, increases fuel consumption and fuel losses and increases smoke discharges."

Tests recently conducted on a Mikado type locomotive show smoke reductions varying from 50 per cent at low and medium rates of firing to 31 per cent at high rates, as shown by the curves in Fig. 1. The locomotive was hand-fired using high volatile Penn gas coal screened over a 1¼-in mesh screen, the coal having the following composition:

Fixed carbon	54.00 per cent
Volatile matter	31.00 per cent
Moisture	9.3 per cent
Ash	14.08 per cent
B.t.u. per pound of dry coal.....	13,088

This locomotive had 70 sq. ft. of grate area, a barrel combustion chamber 42 in. long, a 76-in. arch supported on

four 3-in. arch tubes, an air opening through the ashpan of 7.80 sq. ft.—11 per cent of the grate area—and air openings in the grate of 20.21 sq. ft.—28.8 per cent of the grate area,

In these tests the increase in evaporation, due to the arch, varied from 8½ per cent to 15½ per cent. These three tests are probably the most thorough and reliable that have ever been conducted for the specific purpose of determining the effect of a brick arch on locomotive smoke abatement, and the test results are corroborated by the practical experience of railroad men throughout the country. The principal measures taken by railroads today to meet smoke ordinances consist of issuing firing instructions and equipping locomotives with brick arches.

While it is generally recognized that the brick arch will reduce the smoke emission from a locomotive, the reason therefor may not be clear. The formation of smoke is due primarily to the decomposition of the volatile hydrocarbons contained in all bituminous, semi-bituminous and lignite coals, though the presence of coal dust that is fed into the firebox and whirled out through the tubes unburned, adds to the smoke emissions.

As the name indicates, the volatile hydrocarbons are com-

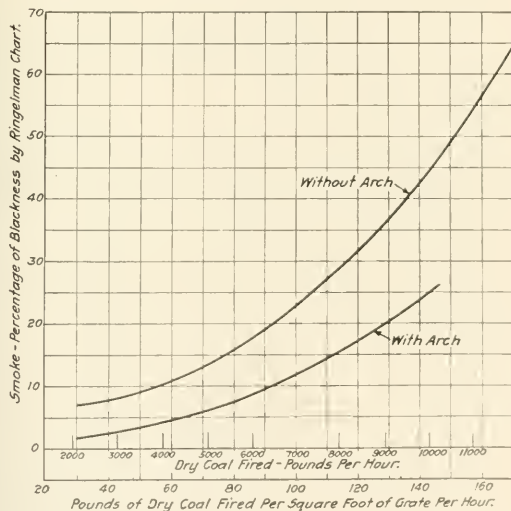


Fig. 1—The Effect of the Brick Arch on Smoke Reduction

pounds of carbon and hydrogen, and are of a very complex character. The heavier compounds are driven off in the form of tar in a semi-liquid or solid state, while the lighter hydrocarbons are driven off in a gaseous state. The distillation begins at a temperature around 400 deg. F., and is completed at a temperature of 1,600 deg. F. The decomposition of the volatile matter by the action of heat takes place very readily at temperatures above 1,400 deg. F.

The exact composition of the hydrocarbons when first distilled from the coal at the different temperatures is not known, as they break down so readily under the influence

*From a paper read before the annual convention of the Smoke Prevention Association.

of heat and are so unstable that it is impossible to collect samples for analysis. The indications are, however, that the heavy hydrocarbons when first driven off contain by weight about 85 per cent carbon, 10 per cent hydrogen and 5 per cent oxygen. Under the influence of heat, these hydrocarbons break down into carbon, hydrogen, oxygen, lighter hydrocarbons of the methane (CH_4) series, and lighter unsaturated hydrocarbons.

The hydrogen is highly inflammable and burns readily if there is an oxygen supply above the fuel bed. The lighter hydrocarbons also burn readily if the oxygen supply is sufficient. If it is insufficient the hydrocarbon is broken down by the heat into carbon and hydrogen, the hydrogen either combining with the oxygen that may be present to form water or escaping into the tubes unburned.

Carbon does not exist in a gaseous state at temperatures with which we are familiar in furnace practice. When the various hydrocarbons are decomposed, the carbon is precipitated as a solid particle in the form of soot and these incandescent particles, floating in the flame, give it the luminous color. We are apt to think of this carbon as being set free and deposited in the form of atoms, but such is not the case. We have no knowledge of the atom existing as a unit, separate and distinct. The small particles of soot with which we have to deal are probably made up of a large number of carbon molecules. The very smallest soot particle that exists is this molecule, which consists of a number of carbon atoms (probably 12), held together by a sort of bond or attractive force of an electrical nature.

As a result the soot particles, which are the primary source of all smoke, have a very tenacious structure and are extremely difficult to break down when once formed. In order to burn them completely, it is necessary to supply a number of oxygen molecules sufficient to combine with each carbon atom, to bring them into contact with the carbon atoms at a temperature high enough to sustain combustion and to provide time sufficient for the combustion to be completed.

These conditions are similar to those met with in burning the "fixed carbon" on the grate, but are more difficult to fulfil. A piece of coke, or carbon, burning on the grate is held more or less in place until it is consumed. Combustion is accelerated by the high temperature prevailing in the fuel bed and by the violent scrubbing action of the oxygen in the air rushing through the fuel bed.

The particle of soot resulting from the breaking down of the hydrocarbons is well on its way to the tubes at the instant of its formation. It is not brought into violent mechanical contact with a supply of oxygen, but floats along in an atmosphere that has been robbed of much of its oxygen in passing through the fuel bed. The temperatures prevailing in the upper part of the firebox are generally sufficiently high to insure ignition and combustion, but under ordinary conditions the time available for combustion varies from $\frac{1}{5}$ to $\frac{1}{10}$ of a second, and this is insufficient.

With the conditions that prevail in the locomotive firebox, it is easier to prevent the formation of soot than to burn it when once formed. The precipitation of soot can be prevented only by having an excess of heated air (or oxygen) above the fuel bed, and bringing this heated oxygen in intimate contact with the volatile hydrocarbons at the instant they are distilled off. Research work done by the United States Bureau of Mines indicates that the hydrocarbons are decomposed when they have travelled but a few inches from the top of the fuel bed, and if the precipitation of carbon is to be prevented the air must be introduced at the top of the fuel bed and intimately mixed with the issuing hydrocarbons.

The chief function of the brick arch in abating smoke is that of a gas mixer. By baffling and compelling all of the gases to pass through a relatively restricted area above the arch an intimate mixture of the volatile combustible with the

oxygen is insured. While the mixing of the gases at the end of the arch does not take place soon enough to eliminate smoke entirely, it has the effect of reducing the smoke emissions, as shown by the tests quoted.

In a firebox without an arch carrying a characteristic fire,—that is, with a bank of green coal under the fire door, the fire gradually becoming thinner toward the front end of the grate, where the draft has possibly pulled a hole in it,—the bank of green coal under the door is expelling large volumes of rich hydrocarbons. These, passing up along the top zone of the firebox, are decomposed by the heat, causing the formation of soot which either escapes at the front end as smoke or is deposited on the heating surfaces to retard the flow of heat.

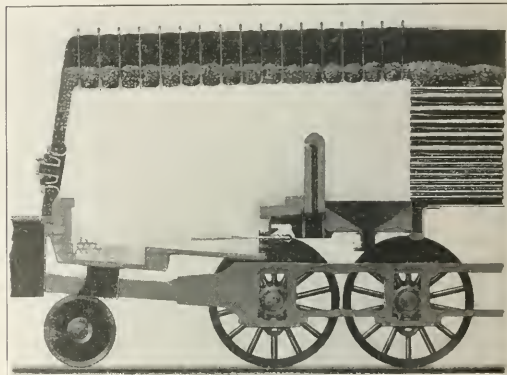


Fig. 2—Type of Combustion Chamber in Successful Use in Oil Burning Service

At the same time a large excess of air is rushing through the thin portion of the fire on the front of the grate, and is passing directly into the lower tubes without in any way aiding the combustion of the hydrocarbons liberated in the back of the box and very often causing flue leaks or failures. Such conditions are not at all uncommon in locomotive fireboxes unequipped with the arch. Front end gas analyses often show a large excess of oxygen, due to the blast of air through the lower tubes, in combination with high carbon monoxide, hydrogen and hydrocarbon contents due to incomplete combustion of the volatile hydrocarbons arising from the bank under the door.

With the arch under similar conditions any excess air coming through the thin portion of the fire on the front of the grates is heated up, deflected and forced back over the end of the arch, where it is mixed with the gaseous combustibles arising from the green coal under the door. A heavy bank of green coal restricts the flow of air at the point where it is most needed and at the time when it is most needed,—with the result that most of the hydrocarbons are broken down and the carbon precipitated before being brought into contact with the oxygen entering through the front grates. With the ordinary type of firebox the combustion chamber space and the flamework are insufficient to give all the particles of soot and combustible gas time to burn before reaching the tube sheet, but such a mixing as the arch affords results in a material reduction of the smoke, and under moderate rates of firing will result in almost complete combustion of the combustible gases.

A light level fire should be carried, if smoke is to be reduced to the minimum. With the fuel bed maintained in this condition by a "scatter" type of firing, a uniform air supply is obtained throughout the fuel bed as well as a uniform distillation of the hydrocarbons. This facilitates the mixture of the oxygen and the hydrocarbons from the time

they leave the top of the fuel bed, the arch mechanically accelerating this mixture.

Some authorities state that the decomposition of the hydrocarbons is caused by heating them up with an insufficient air supply and then bringing them in contact with the cooler heating surfaces or a draft of cold air. While later evidence tends to prove that this decomposition is caused entirely by heat, shafts of cold air through the firebox are objection-

gases in the combustion space provided above the fuel bed.

For a specific example, take the second case shown in Table I, where $47\frac{1}{2}$ lb. of coal are burned per sq. ft. of grate per hour, with the fuel bed six inches thick.

Table II shows in lb. per cu. ft. of gas the weights of the different gases leaving the fuel bed, the heat value per pound and B. t. u. per cu. ft. of gas. The gas has a total heat value of 156.6 B. t. u. per cu. ft., of which 70.7 B. t. u., or 45

TABLE I—GAS SAMPLES TAKEN AT THE TOP OF THE FUEL BED
Wt. in grams per cu. ft. of total gases at 60 deg. F. and 30 in. mercury

Lb. coal fired per sq. ft. of grate per hour	Thickness of fuel bed	C in CO	CH ₄	H ₂	C ₂ H ₄	Total gaseous combustible	Tar	Soot	Total soot and tar	Total combustible	Soot and tar, per cent of total combustible
22.3	5	2.034	.628	.209	.732	3.603	.528	.482	1.010	4.613	21.9
47.5	6	2.136	.142	.068	.036	2.382	.241	.369	.610	2.992	20.4
63.4	6	1.466	.215	.072	.107	1.860	.107	.215	.322	2.182	14.7
124.0	6	1.488	.018	.014	.326	1.846	.004	.016	.020	1.866	1.1
52.0	12	2.536	.484	.173	.242	3.435	.945	.477	1.422	4.857	29.3
105.5	12	2.522	.516	.241	.344	3.623	.658	.738	1.396	5.019	27.8
131.0	12	2.389	.036	.036	.036	2.497	.055	.092	.147	2.644	5.6
185.0	12	1.634	.108	.072	.036	1.850	.123	.415	.538	2.388	6

able—both from the standpoint of combustion and of boiler maintenance.

It is evident from the foregoing that the arch is not in itself sufficient to prevent smoke. Intelligent firing is also necessary. Smokeless firing and intelligent firing are almost synonymous, although there are conditions under which smokeless firing is impossible, regardless of the care and intelligence exercised by the fireman.

In some quarters there has been prevalent an idea that smoke was mainly a nuisance, and that the emission of dark clouds of smoke did not signify any appreciable heat loss. As a matter of fact the emission of smoke not only indicates bad furnace conditions, but in many cases the soot and tar escaping as smoke may contain from 10 to 15 per cent of the heat value of the coal, and this will account for a considerable portion of our "unaccounted-for" heat losses.

Tests conducted by the United States Bureau of Mines (see Technical Paper 137) showed that when burning Penn gas coal as high as 32 per cent of the combustible arising

per cent, are developed in the fuel bed and 85.9 B. t. u., or 55 per cent of the total heat contained in the coal, are developed by the burning of the combustible gases above the fuel bed.

TABLE II—HEAT DEVELOPED IN FUEL BED, AND POTENTIAL HEAT IN GASES, SOOT AND TAR

Heat Developed in the Fuel Bed					
Constituent	Wt. grams per cu. ft.	Wt. lb. per cu. ft.	Heat value per lb.	B.t.u. per cu. ft. gas	
C in CO	2.136	.00471	4,500	21.2	
C in CO ₂	1.546	.00341	14,500	49.5	
Total					70.7
Potential Heat in Gases, Soot and Tar					
C in CO	2.136	.00471	10,000	47.1	
CH ₄	.142	.000313	24,000	7.5	
H ₂	.068	.000149	62,000	9.3	
C ₂ H ₄	.036	.000079	21,600	1.7	
Soot	.369	.000813	14,500	11.8	
Tar	.241	.000531	16,000	8.5	
Total					85.9

The tar and soot shown in the foregoing table contain 12 per cent of the heat in the coal. If one-half of this were to escape unburned as smoke the resulting heat loss would be six per cent; and such losses are constantly occurring.

The amount of heat developed by the gases burning above the fuel bed will serve to illustrate the importance of firebox volume and combustion chamber space, and will also explain why intelligent firing with the use of a brick arch is not always sufficient to prevent smoke. The ordinary firebox in service to-day has not volume and combustion chamber space sufficient to provide the time element that is essential for the complete combustion of volatile hydrocarbons and the total elimination of smoke. This deficiency has been recognized by some of our railroads and during the past few years many fireboxes have been provided with combustion chambers, particularly in locomotives of the 2-10-2 and Mallet types, but combustion-chamber engines are few, when compared with the total number of locomotives in service.

It is also probable that we have been too conservative as to the length of combustion chambers that have been installed. Tests indicate that an 18-ft. or 19-ft. tube is sufficient to reduce the front end temperatures to a normal figure. Tubes of this length, when used in conjunction with a firebox of ample grate area and long combustion chamber, result in a boiler design that gives both high efficiency and high capacity.

Fig. 2 shows a type of combustion chamber that is being used successfully in oil-burning service on some 2-10-2 type locomotives. This firebox has a combustion chamber $41\frac{1}{2}$ in. in length between tube sheet and bridge wall, firebox volume of 435 cu. ft., and an average flame path of 19 ft.

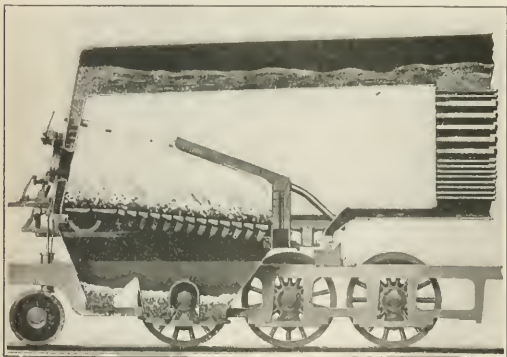


Fig. 3—Gaines Furnace Combined with Barrel Combustion Chamber

from the fuel bed is accounted for in the soot and tar which is the source of smoke.

Table I, which is taken from the bulletin mentioned above, shows the composition of gases arising from the fuel bed and the percentage of the soot and tar therein contained. It is evident from these figures that the fuel bed acts chiefly as a gas producer, and a large part of the latent heat contained in the coal is liberated by the burning of combustible

With a fuel oil containing 85 per cent carbon, nine per cent hydrogen and six per cent oxygen, weighing 7.43 lb. per gallon, having a heat value of 18,878 B. t. u. per pound, it was found that one square inch of air opening in the pan per gallon of oil burned per hour was sufficient to obtain complete and smokeless combustion, even when burning 4,000 lb. of oil per hour. At this rate of combustion, an indicated boiler efficiency of 85 per cent was obtained with the Gaines wall in place. With the wall removed the boiler efficiency was 74 per cent, or a difference of 13½ per cent in favor of the wall. With the wall removed, at a rate of combustion of 4,000 lb. of oil per hour, there was a very noticeable increase in the amount of smoke emitted. This serves to show the need of a baffle or some sort of mechanical mixing device that will insure the thorough mixture of the air with the combustible gases.

For coal-burning service, a modification of the above design is being used most successfully on several railroads. This combination of the bridge wall with air ducts through the wall admitting a secondary air supply above the fire is known as the Gaines Locomotive Furnace. Here an attempt has been made to increase the firebox volume and flameway by reducing the tube length and installing a combustion chamber between the bridge wall and the tube sheet. This firebox has obtained some of the results desired, but for high volatile coal burned at high rates of combustion the combustion chamber space is too limited.

Fig. 3 shows a Gaines furnace in combination with a barrel combustion chamber. Here additional firebox volume and flameway have been obtained by materially increasing the length of the combustion chamber and, as this particular

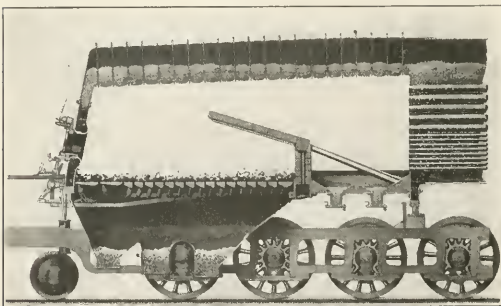


Fig. 4—Gaines Furnace with an Effective Volume of More Than 500 Cu. Ft.

design was used on Mallet engines, this result was obtained without unduly shortening the tubes.

Fig. 4 shows a Gaines furnace installation in the same size firebox, with the barrel combustion chamber eliminated. This firebox has a grate area of 90 sq. ft. and more than 400 sq. ft. of firebox heating surface, with an effective volume of more than 500 cu. ft. The average length of flameway or gas passage is 15 ft. and the over-all length of the firebox is 18 ft. 3½ in. This represents the latest endeavor to secure adequate firebox volume and flameway.

While the results obtained from this type of furnace have proved most satisfactory, there is still room for improvement in the matter of smokeless combustion. The scientific training of firemen, the use of brick arches and the installation of combustion chambers have all tended to reduce the visible emission of smoke, but the burning of high volatile coal at high rates of combustion with the total elimination of smoke has not yet been successfully accomplished; and the indications are that some radical changes in locomotive firebox design and methods of firing coal will be necessary for the accomplishment of this object.

WASHINGTON CORRESPONDENCE

WASHINGTON, D. C., September 25, 1917.

MORE RAILWAY REGIMENTS FOR FOREIGN SERVICE

Additional railway and engineer regiments, in addition to the nine regiments of railroad men organized earlier in the year and who are now understood to be in service abroad, have recently been authorized by the President and the war department and are now being recruited by the engineer corps of the army.

In General Order No. 108, just made public by the war department, the President directs that there be organized for the period of the existing emergency, the enlisted strength being raised and maintained by voluntary enlistment or draft, special and technical engineer troops, including six regiments, and additional smaller units of engineers for each army and 14 regiments for the line of communications, the organization of the latter being under the direction of S. M. Felton, director general of railways.

The authorization for the line of communications, which includes the nine railway regiments already organized, but also provides for an increase in the number of men in each company, from 180 to 250, is as follows:

1. A general construction service, consisting of the following: 1 regimental headquarters, 6 engineer companies (construction), 6 service battalions (4 companies each).
2. An engineer supply service, consisting of the following: 1 regimental headquarters, 2 battalions of engineers (supply) of 3 companies each, 2 battalions of engineers (workshop) of 3 companies each, 3 service battalions (4 companies each).
3. A forestry service, consisting of the following: 1 regimental headquarters, 10 battalions of engineers (forestry) of 3 companies each, 9 service battalions (4 companies each).
4. A quarry service, consisting of the following: 1 regimental headquarters, 2 battalions of engineers (quarry) of 3 companies each, 3 service battalions (4 companies each).
5. A light-railway service, consisting of the following: Construction department, 1 regimental headquarters, 5 battalions of engineers (railway) of 3 companies each, 3 service battalions (4 companies each); operation and mechanical department, 1 regimental headquarters, 4 battalions of engineers (railway) of 3 companies each, 3 service battalions (4 companies each).
6. A standard-gage railway service, consisting of the following: Construction departments, 5 regiments of engineers (railway) (the 11th, 15th, 16th, 17th and 18th engineers, railway, National Army), 8 service battalions (4 companies each); operation and maintenance department, 2 regimental headquarters, 6 battalions of engineers (railway) of 3 companies each, 3 service battalions (4 companies each); mechanical and supplies department, 1 regiment of engineers (shop) (19th engineers, railway, National Army), 1 battalion of engineers (railway) of 3 companies, 1 service battalion (4 companies).

Of these the regiments for the general construction service, the engineer supply service, the forestry service, and the light railway service are new. The 9 regiments already organized are the 11th to the 19th, inclusive. The 20th engineers (forestry) is being formed at American University, Washington, D. C. The 21st engineers, for construction of light railways, is being organized at Camp Grant, Rockford, Ill., under Col. Edward Peak, with H. J. Slifer, consulting engineer and formerly general manager of the Chicago Great Western, as lieutenant colonel.

The engineering organization for each army, in addition to that for the line of communications, will consist of a gas and flame service, a mining service, a water supply service, a general construction service, an engineer supply service, a surveying and printing service, a road service and an army pontoon park.

Service battalions will be transferred from one service to another as may be necessary. Engineer troops of a special service may be utilized in another engineer service in the discretion of the commanding general concerned.

A regimental headquarters will consist of: Commissioned, colonel, 1; lieutenant colonel, 1; captains, 3; total, 5, and enlisted, 38. A battalion of engineers will consist of: Battalion headquarters, commissioned, major, 1; captains, 2; first lieutenant, 1; total, 4, and enlisted, 24. An engineer company will consist of: Commissioned, captain, 1; first lieutenants, 3; second lieutenants, 2; total, 6, and enlisted, 250. An army pontoon park (material, 3 pontoon divisions and 1 supply division, complete) will consist of: Commissioned, first lieutenant, 1; second lieutenant, 1; total, 2, and enlisted, 181. A service battalion will consist of: Battalion headquarters: Commissioned, major, 1; first lieutenant, 1; second lieutenant, 1; total, 3, and enlisted, 6. Four service companies, each of the following personnel: Commissioned, captain, 1; first lieutenant, 1; second lieutenant, 1; total, 3, and enlisted, 250. Wagon companies and truck companies will also be organized of engineer personnel.

The general order also provides for medical assignments for each unit. Other provisions of the order are as follows:

Technical equipment and additional transportation therefor will be supplied by the engineer department.

Railway operating and shop troops, forestry troops, and service battalions will be equipped as infantry, but only 10 per cent will be armed, except during training, when all will be armed; noncommissioned officers of these organizations will be armed with pistols. All other special engineer troops will be armed as divisional engineer troops.

Under authority conferred by the first sentence of section 2 of the act of Congress approved May 18, 1917, enlisted men of the corps of engineers and members of the engineer enlisted reserve corps, selected for these organizations by the chief of engineers, will be transferred thereto under authority of this order. Notation of transfer, and in the case of non-commissioned officers of continuance of warrant, will be made on the individual records of all enlisted men transferred. This authority will not be construed to authorize any enlistments in the enlisted reserve corps in excess of those already authorized. The National Army cantonnments will be utilized for the organization of the units herein authorized. The cantonnement at which each unit is to be organized will be determined by the chief of engineers after consultation with the quartermaster general. When necessary for special engineer training, these organizations may be sent to one of the regular engineer training camps.

The selection of officers for these regiments is under the direction of Mr. Felton, Capt. E. N. Sanctuary of his staff being in charge of matters of personnel. Railway men who have been drawn under the terms of the selective service act may be transferred to the engineer regiments.

STEEL PRICES REDUCED

Reduction in the basic prices of iron, steel, ore and coke, ranging from 43 to 70 per cent, as a result of a more or less voluntary agreement of the steel producers with the War Industries Board and based on cost of production figures, as ascertained by the Federal Trade Commission, were announced with the approval of the President on Monday. The prices, which will apply alike to purchases by the government, the Allies and the public, which includes the railroads as large users of steel, becoming effective immediately, subject to revision on January 1, 1918, are as follows:

Commodity and Basis	Price agreed upon	Per cent of reduction
Iron ore, lower lake ports.....	\$8.05	...
Coke, Connellsville.....	6.00	...
Pig iron.....	33.00	43.1
Steel bars, Pittsburgh, Chicago.....	7.90	47.3
Shapes, Pittsburgh, Chicago.....	3.00	50.00
Plates, Pittsburgh, Chicago.....	3.25	70.5

* Gross tons. † Net ton. ‡ Hundredweight.

It is understood that these prices will not affect existing contracts, but that they will probably be of more immediate benefit to the railroads than the coal prices recently fixed, which applied only to the 20 to 25 per cent of the supply uncontracted for and which in many cases were higher than the prices named in long term contracts of large consumers.

The agreement stipulated that there should be no reduction in wages and the steel men pledged themselves to exert every effort to keep production up to the maximum.

One of the big problems encountered was similar to that so often discussed in consideration of railroad rates, involving the question of how to fix prices that would enable the smaller mills to produce without loss while preventing the larger plants from making too great a profit. It was settled by a plan which there has been great reluctance to apply to the railroad situation, of attempting to allow a fair price to the smaller producers, even if it does allow the larger producers a greater profit, but this decision was facilitated from the government standpoint by the fact that a large part of the profits may be taken by taxation.

Measures will be taken by the War Industries Board for placing orders and supervising the output of the steel mills in such a manner as to facilitate and expedite the requirements for war purposes and to supply the needs of the public in the best interests of all.

Coincident with the announcement of steel prices, the priorities committee of the War Industries Board made public its first general priority circular, giving instructions as to priority in orders and work for all individuals, firms, associations and corporations engaged in the production of iron and steel, and in the manufacture of their products. The committee is composed of Judge Robert S. Lovett, chairman, Major General J. B. Ayleshire, George Armsby, Rear Admiral M. E. Mason, Edwin B. Parker, J. Leonard Replogle and Rear Admiral A. V. Zane.

Under the regulations all orders and work are divided into three classes. Class A comprises war work, i. e., orders and work urgently necessary in carrying on the war. Class B comprises orders and work which, while not primarily designed for the prosecution of the war, yet are of public interest and essential to the national welfare, or otherwise of exceptional importance. Class C embraces all other orders and work. All orders will be classed as Class C unless covered by certificates to be issued by the committee. Orders and work in the other classes will have precedence and classes A and B will in turn be separated into subdivisions composed of orders regarded respectively as of greater moment and to be given precedence in accordance with serial number. Certificates will be issued upon application specifying the classification of the order or work. Certificates of a subsidiary nature will be issued upon request for the furnishing of material and articles required in manufacturing the article or prosecuting the work ordered. War orders of the Allies, as well as of the United States, will be placed in Class A in the case of those already contracted for. Orders previously placed by the War and Navy departments or the Shipping Board will be classed as subdivision A-1 of Class A unless otherwise ordered. Orders already placed by the Allies for war materials will be classed as subdivision A-2 of Class A unless otherwise ordered.

JUDGE ADAMSON TO LEAVE CONGRESS

William C. Adamson, of Georgia, who is chairman of the House Committee on Interstate and Foreign Commerce, who has had a potent influence on railroad legislation in Congress for several years, and who is chairman of the committee that has its name attached to some of the most important railroad laws that have been recently passed, including the eight-hour law for train service employees, has been appointed general appraiser of merchandise at the port of New York and is

to leave Congress shortly, after 20 years of service in that body. His successor as chairman on the Committee on Interstate and Foreign Commerce has not yet been announced, but the next ranking member is Representative Thetus W. Sims, of Tennessee. Judge Adamson's name had also been on the long list of candidates urged upon President Wilson for appointment to the Interstate Commerce Commission.

RAILWAY WAGES AND TAXES INCREASE, RATES DECLINE

The railways of the United States in the calendar year 1916 paid a higher average wage per employee, a greater amount per mile in taxes and handled freight at a lower rate per ton per mile than at any period in their history. These facts are disclosed by a compilation made by the Bureau of Railway Economics of the returns made to the Interstate Commerce Commission by the so-called Class I roads—those having annual operating revenues exceeding \$1,000,000. These returns for the first time are for the year ending on December 31, according to an order of the Commission making the fiscal year coincide with the calendar year, and they cover railways having 89 per cent of the mileage of the country and receiving 97 per cent of the total operating revenues.

Compared with a similar compilation of returns for the year ended on June 30, 1916, the average wage per employee of these roads shows an increase from \$840.62 to \$868.69, or \$28.07. This is exclusive of salaries to general and division officers.

In the same period taxes increased from \$631.29 per mile to \$680.63 per mile, or \$49.34; and the average freight rate per ton mile decreased from 7.07 mills in the year ended on June 30, 1916, to 7.06 mills in the year ended on December 31, 1916. Passenger rates increased slightly as between the two periods—from 1.995 cents in the year ended on June 30, to 2.042 in the year ended on December 31.

The mileage included in the two compilations is substantially the same, being 231,246 miles in the statement for the former fiscal year and 231,179 in the statement covering the new fiscal year.

The increase in the volume of service performed in the two periods under comparison was from 339,883,000,000 to 362,134,000,000, or 22,251,000,000 ton miles of revenue freight, and from 33,783,000,000 to 34,573,000,000 or 790,000,000 passenger miles.

The average number of employees of these roads, exclusive of general and division officers, increased from 1,563,928 to 1,626,103, or by 62,175; and their aggregate compensation increased from \$1,314,665,664 to \$1,412,579,190, or \$97,913,526. The increase in number of employees was 4 per cent and in their compensation 7.4 per cent.

Total operating revenues increased from \$3,381,945,764 to \$3,592,591,023, or \$210,645,259, equal to 6.2 per cent. Operating expenses increased from \$2,211,071,443 to \$2,354,548,724, or \$143,477,281, equal to 6.4 per cent. Taxes increased from \$145,536,535 to \$156,875,396, or 7.7 per cent.

Investment in road and equipment showed an increase for the year ended on December 31 as compared with the year ended on June 30, of \$198,658,088.

RED CROSS TRANSPORTATION SERVICE.—Major Murphy, head of the Red Cross Commission in France, has sent a cablegram to America asking for expert motor-truck drivers without delay. Owing to the congestion of the railroads in France, large quantities of Red Cross supplies are being transported by motor truck from seaports to Paris and other distribution centers.

AMERICAN RAILWAY REGIMENT NOW OPERATING MILITARY RAILROAD

"By day and by night the men of the American regiment of engineers which has taken over an important line of French strategic railways are hauling tons upon tons of ammunition and other supplies to the French army units operating against the Germans.

"The American regiment," continues an Associated Press despatch, "has been turned over as a unit to the French and is getting all its supplies except clothing from the French government. The officers and men entered upon the work with the greatest enthusiasm, and they have been under German bomb and machine-gun fire from airplanes.

"Within the last few nights a heavy train of supplies hurrying toward the front was attacked by several enemy planes. None of the bombs came dangerously close, but every time the fire-box of the engine was opened for stoking the planes swooped down upon the train and spattered it with steel-jacketed bullets.

"This fire got so hot that eventually the train was stopped, the crew taking refuge beneath the engine. Relating their experience afterward these trainmen rather 'swanked' about it over their inexperienced brothers.

"The spirit of adventure is strong throughout the American ranks and the engineers who so far have not been bombed are openly jealous of their more 'fortunate' comrades. So far none of the regiment has been under shell fire, but the men may yet have a taste of the noisy German 5.9s and the whistling 'Percys,' 'Woolly Bears' and 'Whiz-bangs.'

"There is a great spirit of comradeship among the officers and men, most of whom have worked together and have known each other for years. The regiment is known as an operating unit as opposed to the engineers enlisted as construction units.

"Before proceeding to the front the regiment was quartered in a little French town within the zone of the French army. The arrival of the Americans at this town was kept secret and they marched into the place late at night after all lights had been extinguished. The soldiers were not allowed to smoke, strike matches or say a word. Despite the stealthy entrance, however, the French townspeople knew quickly of the arrival and soon the streets were filled with a quiet throng which joined in among the Americans and paraded with them arm in arm.

"It was one of the strangest welcomes any troops probably ever received anywhere, but it was at the same time one of the most sincere."

AN ABLE LOOKING BODY OF MEN

Speaking also of this regiment, Lincoln Eyre, staff correspondent of the New York World, in a copyright despatch, said last Friday: "I accompanied the engineers to the front from the base town in which they had been spending a month for instructional purposes. Nowhere among the American troops in France have I seen a higher spirited or abler looking lot of men. Their hilarity as they entered the train which was to carry them to their corner in a famous battle region almost shocked the poilus watching them. After three years of it there is no laughter in a Frenchman's heart when he sets out for the front. With him it is just a grim job that has got to be done; with these railroaders it is adventure, romance, opportunity for glorious achievement. They are fired with enthusiasm for everything and everybody—for their country, for every reason one can imagine, for France for which they are to do their bit, for Great Britain where they landed and received a boisterous welcome, for themselves because they are picked men and know it. . . .

"From their spaciiously comfortable barracks, especially cleaned, white-washed and disinfected for *les Américains*, in which the engineers spent their first month in France, they

moved in troop trains, motor trucks and automobiles to villages in the region where they will pass the winter. Their headquarters is established at a point carefully chosen with a view of its proximity to the principal stations on the railroad they have already begun to operate.

"This line, which is of course military and one of the chief feeders of a French army, is manned by both French and American engineers. In a very short time, however—as soon, in fact, as they have mastered the details of the French methods of operation, which, being under the direction of the French, they will adopt in every particular—the regiment will run the road entirely by themselves from top to bottom. They will then form one of the engineering units of this French army.

"The French will supply them with rations and quarters. There is universal satisfaction, I found, with both. The engineers are housed in well built wooden huts, with plenty of light and air, and are fed so well they have almost forgotten to yearn for the flesh pots of home. At the officers' mess, at which I was a guest, the luncheon dished up by a French chef provoked comparisons with food at some of New York's high priced restaurants highly unfavorable to the latter."

FIVE AIR RAIDS IN FOUR DAYS

Many interesting letters have been received recently from members of railway regiments in France. The letter of which the following is a part was received from a member of the Thirteenth Engineers (Railways), the regiment which was quartered at Chicago before leaving for Europe:

"For interest and thrills this place (somewhere in France) beats anything I've ever struck in the short and varied career of my sweet young life. About an hour ago the alarm was sounded—German air raid! Everybody is supposed to duck into a bomb proof. I tried to get up on to a roof to see the big scrap and nearly landed in a cell as a result. They've apparently located our regiment, as we've had five air raids in four days.

"We spent two days in an English camp, crossed the channel in a cattle ship with a Chinese crew—no bunks—slept on deck. Obeying orders, I was completely surrounded by a life preserver until we landed. Then there was a long ride in a day coach, and we arrived at our present location at midnight. The entire population of the town and surrounding country was on hand to welcome us. No lights were permitted to be shown at night. Under the very dim light of a shaded lantern, the general in command of the French bade us welcome. Our colonel replied in a graceful speech and we marched three miles through inky darkness to barracks.

"There was no keeping the crowd back. White-haired men and women and little boys and girls crowded into the ranks as we marched. They hung on to our blouses, wrung our hands, laughed, cried, and sang. We were the first American regiment to get up within sound of the guns. Far off on the horizon the sky was illuminated at frequent intervals by the explosion of light bombs and the fire of the heavy artillery."

PARADE IN LONDON

Another member of the same regiment, Ernest J. Carr, writes that he was the first American who ever carried the American flag before the king of England. He wrote:

"We were in London for a day, and the whole regiment, together with other railway engineer regiments, paraded through the streets. We saw all the places of note—Buckingham palace, houses of parliament, river Thames, Wellington barracks, and several other places. King George of England reviewed our regiments in front of Buckingham palace. There was a long article about us in the London Mirror, as well as in several London daily papers.

"I carried the American flag past King George and he saluted. Ours were the first American troops, also the first armed troops of any foreign nation to pass through the streets of London and past the king of England. I am the first American in all history to bear the American flag before the king of England.

"The London Mirror carried a picture of me and the other color sergeant, and guards . . . The people of London turned out by the thousands. Everywhere we received a warm welcome. They cheered the troops and the flag all along the line."

A letter from Ralph C. Wirth, Company C, Thirteenth Engineers, states that following the review of the regiment by the king and queen of England, a light lunch was served the troops in Green Park, which is for the private use of the English royal family. He also states that following their arrival at Liverpool on August 12, the regiment engaged in gas drill at a training camp for five days. By "gas drill" is meant practice in the use of measures to protect the men from German gas bombs.

NEWSPAPER COMMENT ON PARADE

A London newspaper clipping received from an American engineer indicates what a holiday the English made of the parade of American soldiers:

"Very early in the morning people discovered their viewpoints and waited patiently watching the enormous crowds that joined us. Traffic was diverted or stopped altogether. Shops were shut and business suspended and later the meeting of the War Cabinet itself was adjourned so that the prime minister and his colleagues might become as the people of the streets making greeting to the men who 'mean to see it through.' . . . Londoners are not very ready to cheer. Theirs is the way of silent tribute. But yesterday they forgot the silly traditions of British reserve. They might have been Irish or Italian in their wild enthusiasm. For, as the first Americans were seen, cheers were raised such as have never been heard in London. . . . Louder and still louder rose the cries as the Stars and Stripes came in view. Soldiers in the crowd saluted; men raised their hats, and women threw their flowers and waved their handkerchiefs—and some of them sobbed happy tears of pride such as no man or woman need remember with shame."

Sergeant H. W. Hofmann of the Thirteenth Engineers writes of the difficulty encountered in speaking with the French: "Usually carry a French-English book containing common phrases and after searching through the book about an hour and going through two or three million motions, succeed in completing a sentence. When going to a restaurant in town to get something to eat I've found the best plan to go to a place where only table d'hôte meals are served. Had almost as much trouble understanding the lingo of those cockney Englishmen, while we were in England, as we do the French."

NEAR VERDUN

Another member of the same regiment writes: "Are now quartered in very comfortable barracks, in a large town about 20 miles from the firing line and about 30 miles from Verdun, and can plainly hear the roar of the big guns night and day. Airships are active overhead all the time and have witnessed several air battles. This town is frequently bombed by the German raiders and usually at night. I was in London several Sundays ago when the city was bombed in an air raid, and several people were killed. . . . Tobacco is high here and doubly so in England, where 24 cents is charged for a five-cent sack of Bull Durham and 44 cents for a ten-cent can of Tuxedo. . . . I made an interesting trip this morning to an old battlefield and went through some of the trenches that the Germans have used. I could get wagon-loads of souvenirs if I wished."

Brake Pipe Leakage and Compressor Capacity*

Testing Train Leakage by Charging Through an Orifice Designed to Supply Maximum Allowable Leakage

By C. R. Weaver

Supervisor Air Brakes, New York Central, Cleveland, Ohio.

IT has been customary to determine the brake pipe leakage by making a 10 lb. brake pipe reduction, lapping the brake valve and noting the rate of drop in brake pipe pressure. Then, knowing the volume of the brake pipe, it is possible to calculate the cubic feet of free air lost from the brake pipe, during the first minute. This figure is commonly accepted as a measure of the relative condition of trains on the road with respect to leakage from the brake system.

After an extended investigation of long freight trains, the writer was convinced that the information so obtained was of little value and rather misleading than otherwise. Trains were found on which the brake pipe leakage, as noted above, was not excessive, and the compressor capacity ample to supply the air required for maintaining the pressure in the brake system, but subsequent observations on the road showed the compressor capacity insufficient to supply the air lost.

There are several causes for apparent disagreement of such observations, namely:

(1) Opening up of leaks in hose couplings and pipe connections when the train is in motion that do not exist when the train is standing.

(2) Leakage caused by movement of apparatus when running due to insecure fastening of reservoirs or brake cylinders to the car body.

(3) Leakage from the auxiliary reservoir side of the triple valve piston caused by leaky gaskets, leaky release valves, etc.

How much influence these causes may have is uncertain, but the fact remains that trains having no more brake pipe leakage, measured in the usual way, than could be easily supplied by the compressor capacity, have been found in numerous cases to overtax the compressor, causing its failure.

It is very difficult to ascertain brake pipe leakage, in fact, it can only be done by closing all the triple valve cut-out cocks throughout the train, which is impracticable and of little value, since it is the volume of air that escapes from the system that is now the vital consideration as far as train movements are concerned, i. e., time to charge the brake system and to restore and maintain the required pressure.

There is, however, another side of this: viz., the effect of the brake pipe leakage on the operation of the brakes, such as lessening the ability to release all the brakes in the train, and lengthening the time in which they can be released. The leakage may also become so great that a brake application commenced by the engineer may result in a continuous application of the brakes. However, this is hardly likely to become serious with the long, large volume air brake trains of today, since the capacity of the compressor, the limitations of transmission of the air by the passageways of the brake valve and feed valve, and the ability to transmit air in sufficient quantity through the pipes of the present long trains will be exceeded before the brake pipe leakage, in pounds per minute, has any serious effect upon the operation of the brakes.

The whole question of brake pipe leakage resolves itself into what quantity of air may be permitted to escape from the brake system and still permit charging, maintaining and re-

plenishing the brake system in such time as will not impose limitations upon traffic in the way of delays, getting trains ready in the yard, and operating them over the road.

It is very difficult to ascertain what quantity of air is actually leaking out of the brake system. It is not difficult to find out what drop takes place in the pressure, but this varies owing to variations in methods of making tests, positions assumed by triple valves, etc. It is not difficult, however, to fix on some quantity of air that may be permitted to leak out of the brake pipe and then supply in the yard this quantity of air to a train previously charged and observe whether or not the quantity supplied does, or does not, maintain the required pressure. If it maintains or more than maintains the pressure, it is apparent that the leakage of the train is no more than can be permitted. If it does not maintain the pressure then the leakage must be reduced to the point where it can be maintained. The permissible amount of leakage from the entire brake system is the starting point. Too much leakage must not be allowed or an undesirably large compressor capacity or high degree of compressor maintenance will be necessary. An excessively low amount of leakage must not be insisted upon, or traffic will be interfered with on account of the time required to stop the leaks.

In order to arrive at some basis of what would be the allowable leakage, the Interstate Commerce Commission condemning tests of air compressors is the basis of the available compressor capacity. This, by the way, in the writer's opinion allows too wide a variation in the condemning tests. A New York No. 5 compressor is only required to deliver 59 cu. ft. of air, which is only 65.5 per cent of its capacity when in good condition, whereas the 8½-in. cross-compound compressor is required to deliver 86 cu. ft. of free air, which is 90.5 per cent of its good condition performance.

DETAILS OF TESTS

It was decided to determine the leakage by means of an orifice through which air would be supplied at a definite pressure which would be sufficient to provide for the maximum amount of allowable leakage. If, with this arrangement it was not possible to maintain the pressure in the brake pipe, then the leakage was too great. If the brake pipe pressure remained the same, or was raised, it would then be known that the leakage was not excessive. The tests were made on a 100-car freight train, conforming to the following specifications:

Size of equipment, 10-in. (combined); length of cars, 42 ft.; brake pipe volume per car, 920 cu. in.; auxiliary reservoir volume, 2,440 cu. in.; leakage uniformly distributed at car 4 and every tenth car up to and including car 94, regulated by cocks in branch pipe near triple valve; test gages on branch pipes of cars 1 and 95 and on auxiliary reservoir of car 1.

The locomotive equipment was as follows:

Brake equipment, No. 6 ET; main reservoir volume, 50,000 cu. in.; main reservoir pressure, duplex control 100 lb. and 130 lb.; compressor, two 9½-in. or one 8½-in. CC.; steam pressure, 195 lb. to 210 lb.; test gages on main reservoir and brake pipe.

The orifice was placed between the yard air system and the train with a by-pass in which was placed an air meter

*Abstract of a paper presented before the September meeting of the Central Railway Club.

(Toolometer) by means of which the amount of air passing through the orifice was determined.

Two main classes of tests were made which may be referred to as charging tests and pump up tests. The first charging tests were made with an orifice $17/64$ in. in diameter, which was computed to furnish an amount of air equivalent to 75 per cent of a New York No. 5-A compressor capacity. With this orifice and a constant pressure of 80 lb., the brake pipe leakage was regulated until the air flowing through the orifice was just able to maintain 70 lb. pressure in the brake pipe of the first car. By means of the Toolometer it was found that this rate was 41 cu. ft. of free air per minute.

This rate was used as a basis for making the pump up tests, using the locomotive with two $9\frac{1}{2}$ -in. compressors and 200 lb. steam pressure. Fig. 1 shows a graphic record of the results of the pump up test in which an empty train was charged to a pressure of 70 lb. on car 1. The train was charged with the brake valve in running position. When the first car of the train was charged to 70 lb., an attempt was made to raise the pressure to 85 lb. by placing the brake valve handle in full release position. After more than 20 minutes the pressure became stationary at $82\frac{1}{2}$ lb. By means of the orifice, the yard plant apparatus and the Toolometer, it was found that 50.4 cu. ft. of free air per minute was required to maintain the total train leakage under these conditions.

It was then concluded that the total leakage rate of 41 cu. ft. of free air per minute at 70 lb. pressure on the first car was too great. The orifice was therefore replaced with one of $1/4$ -in. diameter. This showed that 70 lb. could be maintained on the first car with an 80-lb. yard pressure, with a total leakage rate of 35 cu. ft. of free air per minute. The pump up test was then repeated and the brake pipe pressure on the first car was raised from 70 lb. to 85 lb. in about 15

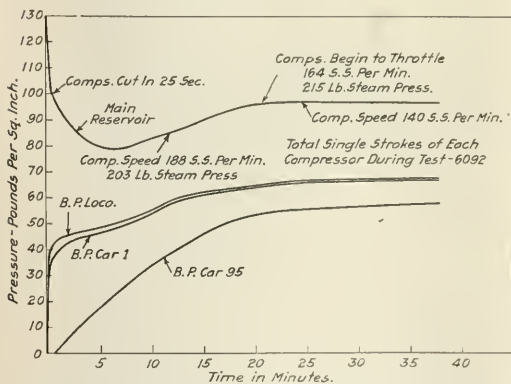


Fig. 1—Time of Charging Train with Leakage of 41 Cu. Ft. per Minute; Brake Valve in Running Position

minutes, thus showing that the $1/4$ -in. orifice was suitable. Fig. 2 shows a graphic record of the second series of pump up tests where the leakage had been reduced to 35 cu. ft. of free air per minute.

Other tests were made to show how time could be saved in charging the train by placing the brake valve in the release position until the train had been nearly fully charged, then moving it to a running position, thus bringing the feed valve into operation so that it would not be overcharged. Tests were also made to determine the best way of handling the yard charging orifice. The Toolometer readings were checked and found to be sufficiently accurate.

CONCLUSIONS

The ordinary method of measuring brake pipe leakage on trains is not an accurate check on the total amount of train leakage which the compressor on the locomotive must be able to supply if the train is to be handled successfully.

The method suggested for measuring the total leakage by charging the train through an orifice supplied with a fixed pressure does not afford an accurate means of measuring the total train leakage.

If the maximum permissible amount of train leakage is

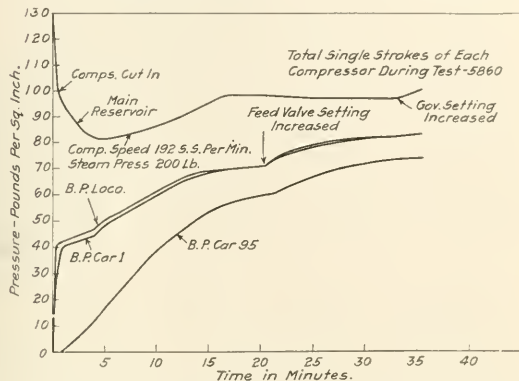


Fig. 2—Time of Charging Train with Leakage of 35 Cu. Ft. per Minute; Brake Valve in Running Position

fixed upon, an orifice size can be determined which when supplied with a constant pressure of 80 lb. from a yard plant will just supply the necessary amount of air to the train to maintain the leakage specified.

Such a charging orifice can conveniently be used while charging a train from the yard plant and it will afford a means for accurately determining whether the total leakage of the train is less than, equal to or greater than the maximum permissible leakage.

The best method of manipulating the charging orifice test apparatus is for the operator to start the test with the by-pass around the orifice open and then as the train charges gradually close this by-pass so as to maintain 70 lb. brake pipe pressure on the first car of the train. This method will accomplish the charging of the train in a minimum of time and avoid any objectionable overcharging.

The foregoing seems to point out the necessity of a better brake maintenance and a better initial installation of the brake apparatus; this has particular reference to securing the reservoirs and cylinders to the car body and proper clamping of the brake pipe. A large majority of the leaks are due to loose reservoirs, cylinders, and brake pipes. Tightening of the unions when these parts are loose only affords temporary relief. More attention should be paid to hose couplings when mounting hose, as many are found that do not gage and when coupled, leak.

A recent investigation of 12 trains, varying from 80 to 114 cars per train, showed a loss of air from 50 per cent to 93 per cent of the compressor capacity. Losses of this kind are not only expensive in compressor maintenance and coal consumption, but cause serious delays to traffic.

The writer wishes to express his appreciation to the Westinghouse Air Brake Company for assistance in conducting the tests and compiling the test data.

DISCUSSION

The discussion indicated a general appreciation of the seriousness of train leakage on roads handling trains approach-

ing and often exceeding 100 cars. Not only has the difficulty of maintaining and supplying adequate train pipe pressure been increased by the handling of long trains, but heavy cars and the severe shocks which result from rough handling have greatly added to the difficulties of maintaining a reasonably tight train line. Under these conditions, reservoirs inadequately secured and pipes not sufficiently clamped, are soon jarred loose and excessive leaks result. The need of co-operation between the maintenance forces and designers, in order that the location of the air brake equipment and the methods of securing it to the car may be such that it will adequately perform its functions, was pointed out.

The opinion was expressed that the time has arrived when a complete system of piping designed especially to meet the requirements of locomotive and car service is needed. The piping now in use is not essentially different from that used for gas and water in our houses under the most favorable conditions so far as external stresses are concerned; it is an adaptation of existing facilities not well suited to meet the entirely different conditions under which they must operate. Attention was called to the frequency with which a poorly designed piping layout is found on hopper bottom cars where the reservoir is often placed directly over the train pipe with a branch pipe not over 12 in. or 14 in. long, and this made up largely of elbows and couplings. With the train pipe located between the center sills it is often impossible to locate, much less attend to repairs to a leak when it is located.

One of the most prolific causes of train leaks is inadequate reservoir fastenings which permit the reservoir to become loose under the stresses imposed in service. It is usually the practice to leave the stopping of leaks until trains have been made up and tested in the yards. Under such conditions time does not permit of doing more than patching up unions and other similar repairs, the result being that leaks caused by loose reservoirs are immediately opened up again as soon as the train is in motion. It was suggested that such repairs might well be made on the house track while cars are being loaded, at which time the leaks could be permanently stopped and delays in despatching trains materially reduced.

APPROPRIATION FOR TRANSPORTATION

A total of \$350,000,000 for the transportation of the army and its supplies is provided for in the deficiency appropriation bill passed by the House on September 18 and sent to the Senate. The provisions governing this expenditure are as follows:

"For transportation of the army and its supplies, including transportation of the troops when moving either by land or water, and of their baggage, including members of the Officers' Reserve Corps, enlisted men of the Enlisted Reserve Corps, and retired enlisted men when ordered to active duty, including the cost of packing and crating; for transportation of recruits and recruiting parties; of applicants for enlistment between recruiting stations and recruiting depots; for travel allowance to officers and enlisted men on discharge; for payment of travel allowance as provided in section 126 of the act approved June 3, 1916, to enlisted men of the National Guard on their discharge from the service of the United States, and to members of the National Guard who have been mustered into the service of the United States and discharged on account of physical disability; for payment of travel pay to officers of the National Guard on their discharge from the service of the United States, as prescribed in the act approved March 2, 1901; for travel allowance to persons on their discharge from the United States disciplinary barracks or from any place in which they have been held under a sentence of dishonorable discharge and confinement for more than six months, or from St. Elizabeth's Hospital after transfer thereto from such barracks or places, to their homes (or elsewhere as they may elect), provided the cost

in each case shall not be greater than to the place of last enlistment; of the necessary agents and other employees, including per diem allowances in lieu of subsistence not exceeding \$4 for those authorized to receive the per diem allowance; of clothing and equipage and other quartermaster stores from army depots or places of purchase or delivery to the several posts and army depots and from those depots to the troops in the field; of horse equipment; of ordnance and ordnance stores, and small arms from the foundries and armories to the arsenals, fortifications, frontier posts, and army depots; for payment of wharfage, tolls, and ferriages; for transportation of funds of the army; for the hire of employees; for the payment of army transportation lawfully due such land-grant railroads as have not received aid in Government bonds (to be adjusted in accordance with the decisions of the Supreme Court in cases decided under such land-grant acts), but in no case shall more than 50 per cent. of full amount of service be paid: *Provided*, That such compensation shall be computed upon the basis of the tariff or lower special rates for like transportation performed for the public at large and shall be accepted as in full for all demands for such service: *Provided further*, That in expending the money appropriated by this act a railroad company which has not received aid in bonds of the United States, and which obtained a grant of public land to aid in the construction of its railroad on condition that such railroad should be a post route and military road, subject to the use of the United States for postal, military, naval, and other Government services, and also subject to such regulations as Congress may impose restricting the charge for such Government transportation, having claims against the United States for transportation of troops and munitions of war and military supplies and property over such aided roads, shall be paid out of the moneys appropriated by the foregoing provision only on the basis of such rate for the transportation of such troops and munitions of war and military supplies and property as the Secretary of War shall deem just and reasonable under the foregoing provision, such rate not to exceed 50 per cent. of the compensation for such Government transportation as shall at that time be charged to and paid by private parties to any such company for like and similar transportation; and the amount so fixed to be paid shall be accepted as in full for all demands for such service: *And provided further*, That nothing in the preceding provisos shall be construed to prevent the accounting officers of the Government from making full payment to land-grant railroads for transportation of property or persons where the courts of the United States have held that such property or persons do not come within the scope of the deductions provided for in the land-grant acts; for the purchase and hire of draft and pack animals in such numbers as are actually required for the service, including reasonable provision for replacing unserviceable animals; for the purchase, hire, operation, maintenance, and repair of such harness, wagons, carts, drays, other vehicles, and motor-propelled and horse-drawn passenger-carrying vehicles, as are required for the transportation of troops and supplies, and for official, military, and garrison purposes; for drayage and cartage at the several depots; for the hire of teamsters and other employees; for the purchase and repair of ships, boats, and other vessels required for the transportation of troops and supplies and for official, military, and garrison purposes; for expense of sailing public transports and other vessels on the various rivers, the Gulf of Mexico, and the Atlantic and Pacific Oceans, \$350,000,000."

CANADIAN RAILWAYMAN HONORED.—Lieut.-Col. C. W. P. Ramsay, chief engineer for construction, Eastern lines, Canadian Pacific Railway, and now with the Canadian Army in France, has been made a Companion of the Order of St. Michael and St. George.

HALF MILLION TROOPS MOVED BY RAIL

With words of the highest praise for the railways, Secretary of War Baker announced on Monday that since early in August, when large troop movements began, the roads had transported 502,000 soldiers to training camps, cantonments and seaports without any serious derangement of their regular passenger schedules and without serious injury to a man.

"This strikingly illustrates," said Secretary Baker, "the patriotic co-operation of the railroads with the government and also the tremendous capacity of American railways. I think the railroads deserve great credit for this achievement."

The figure used by Secretary Baker, which represents the



Good Bye, Broadway—Hello, Camp Upton

total up to Sunday night, and covers approximately half of the initial movement now under way, includes the units of the regular army and the railway engineer regiments that have gone to France, those of the National Guard units that have been moved to training camps, and the first two increments of the 687,000 selected for the National Army that have been moved from 4,531 local concentration points to their 16 cantonments.

The National Guard movement, which began early in August, includes about 300,000 men and their impedimenta. The National Army movement began on September 5-9 when about 5 per cent of the total, or approximately 35,000 men, were transported. These were handled on regular passenger trains, one-fifth starting from their originating points on each of the five days, and required no special schedules. The second increment of 40 per cent, or approximately 275,000 men, were entrained from September 19 to 23; another 40 per cent is to be entrained from October 3 to 7 and the remaining 15 per cent beginning October 19. During the transportation of the second increment of the National Army the movement of the National Guard was temporarily postponed, to be resumed early in October.

From most of the local concentration points only a few men were moved at a time, special trains being required only for the contingents from the larger cities, but as the cantonments were approached the movement became more concentrated and extra coaches were attached. When these reached a certain number they were detached from the regular trains and made up into special trains. Day coaches were used for the shorter trips and tourist sleepers for those located farthest from the cantonments.

Under the arrangements worked out by the American Railway Association schedules were prepared by the passenger associations in conference with representatives of the operating departments and then approved by the Quarter-

master General. Orders were issued that passenger equipment be immediately emptied upon arrival and immediately returned to the road from which received. Orders for the disposition of Pullman equipment released were waiting for the cars at destination.

When requests for such information were made, the railroad officers were authorized by the Quartermaster General to confidentially notify Red Cross officials at points where troop trains were scheduled to stop of the expected time of arrival, in order that the Red Cross organization could give attention to the troops in transit. Where troop trains contain both passenger and freight equipment, the Railroads' War Board has ordered that the freight cars should always be on the rear of the train. This permits proper heating of coaches and Pullman cars when the weather requires it.

The Adjutant General has issued a circular to all department and division commanders directing commanding officers of troop trains when arranging stops en route for feeding, watering and resting animals to co-operate with the operating officials of the railroads in having such stops made, as far as circumstances will permit, at such time and place as will be agreeable to the operating requirements and needs of the railway service.

THE Y. M. C. A.

Secretaries of the Railroad Y. M. C. A. accompanied about 200 of the trains carrying drafted men in the second contingent of 40 per cent to the cantonments. These secretaries told the men about the work of the Y. M. C. A. in the camps and overseas. They distributed magazines and stationery, and by this means and through personal contact in other ways made the trip an easier one for all concerned, the soldiers-to-be themselves, the men in charge and the train crews.

HANDLING TROOPS TO CAMP UPTON

Camp Upton, on Long Island, by last Sunday night had received not quite 11,000 of the camp's quota of 43,000 men for the new National Army. These men had been arriving on special trains from New York City the five preceding



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The Last Chance to See the Selected Men in "Mufti"

days and will be adjusted to their new surroundings when a similar number follow them late this week.

The camp will train for the National Army the men from New York City, those from Westchester, Putnam and Dutchess counties, on the east side of the Hudson river just to the north of New York, and those from Nassau and Suffolk counties making up the remainder of Long Island outside of New York City.

The camp itself lies just to the north of the main line of the Long Island Railroad between Yaphank and Manorville stations and is about 63 miles east of New York City. The

railroad is single track from Hicksville, which is about half way to the camp, so that the extensive passenger and freight traffic required for the camp has to be handled accordingly.

The movement of men to the camp practically all comes through New York, Brooklyn or Long Island City and is complicated by the necessity of using electrically operated steel equipment through the tunnels under the river out of the Pennsylvania Station, or the subway out of Flatbush Avenue Station in Brooklyn and of transferring to the steam operated wooden equipment beyond. The road, following its usual practice, has worked out the scheme of carrying the men in multiple unit electric trains out of these two stations and of transferring them car by car at Jamaica, the general transfer point, 11 miles out.

The various draft boards bring their quotas on foot, in automobiles or trolley cars to the stations, and each lot of men is kept together in one or two cars. The second movement, which began Wednesday and ended Sunday, required three or four trains daily, each train consisting of from 10 to 14 cars. The trains came through the 63 miles in about three hours, which is very good, considering the fact that the line is only single tracked and is now carrying far more than its accustomed amount of both freight and passenger business. The men from the different boards remain in charge of a member of the board, but at Medford, two stations before the camp, the train is boarded by army officers, so that when it arrives at the Camp Upton station the men can be taken off the train and marched immediately to their new barracks.

One of the interesting features of handling the trains has been the work of the Y. M. C. A. Thus far the Railroad Y. M. C. A. has been able to have a secretary on all but two trains. This representative has introduced the Y. M. C. A. to the men and gotten them interested in the work it is planning to do at the camp and has also helped the railroad and the army officers to no small degree in getting the men ready to receive the officers at Medford.

The Long Island is one of the few roads of the country



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Express—No Sleepers.

that has had to handle a movement to a cantonment almost exclusively. It has also had to move large numbers of visitors to Camp Mills at Mineola where the Rainbow Division, 27,000 strong, is encamped, awaiting orders to embark for France. Fortunately the Long Island is a passenger railroad and this new traffic has come after the summer rush is over. There has thus far been no serious shortage of cars or of locomotives.

The facilities for receiving the men at Camp Upton are fast being put in readiness. There are now two stations at the camp, one on the main line and one on a wye which

extends north into the camp proper. The total trackage laid down was approximately 11 miles in length, three-quarters of a mile for a siding on the main line, $3\frac{1}{4}$ miles for a temporary contractor's siding and a little over seven miles for the permanent layout for the camp itself. This permanent trackage includes a wye to facilitate operation, a freight yard for about 100 cars, an engine yard and also serves a row of 10 government warehouses, an l. c. l. freight station, team tracks, etc., and the passenger station, now in process of construction. The passenger station tracks are four in number, each long enough to hold a good-sized train and with wide gravel platforms between. The Long Island for some time has been handling the camp laborers to its main line



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A View from Another Railroad. Leaving North Station, Boston, for Camp Devens

station, and it has been doing an exceedingly large business, because the mosquitoes drove the contractors' men both to distraction and home. Conditions, of course, are much better now. The Long Island at one time had to bring down and carry back its own laborers in a work train each day, because the men refused to board at the camp even at increased wages. The road now has facilities for 98 clerical and other employees at the camp, including comfortable offices, barracks and an attractive eating place at which the men can obtain meals at 25 cents each. Until these buildings were ready these men had to work in converted passenger cars; at one time the freight office with about 28 clerks had its headquarters in a single car.

SPECIAL RATES FOR SOLDIERS

The special trains for drafted men come, of course, to the station on the wye. The Long Island will shortly begin to make a much more extensive use of its camp station, however, because it will establish a schedule of five camp specials each way daily. On four of the westward trains (to New York), all in the evening, and on two of the returning trains, leaving New York at 9:29 and 11:44 in the evening, respectively, for soldiers only,—officers and enlisted men in uniform,—will be allowed a special rate of 60 cents for the round trip, this being at the rate of less than one-half cent a mile. On the other specials, for visitors and soldiers, soldiers will pay \$1.20 for the round trip. Visitors on these specials will be given a special rate of \$2.50 for the round trip, and even this is a considerable reduction, for the regular fare is \$3.54. The specials will make only one stop—at Jamaica—where passengers will change cars for the New York or Brooklyn stations.

RUSSIAN RAILWAY LOAN.—The Petrograd newspapers announce the forthcoming issue of a second so-called railway loan. The money will be used for 17 railway companies which have been taken over by a syndicate of banks. The loan will be for rubles, 750,000,000 (\$386,000,000), the rate of interest $4\frac{1}{2}$ per cent, and the price of issue 81 $\frac{1}{3}$.



The Bridge Showing the Suspended Span in Place

Quebec Bridge Central Span Successfully Hoisted

Roller or Key Bearings Used as Supports During
Raising Instead of Rocker Bearings and Steel Castings

By A. J. Meyers

Chief Draftsman, Board of Engineers, Quebec Bridge

ONE of the greatest feats of bridge engineering the world has ever seen was brought to a successful conclusion on Thursday, September 20, 1917, at 4.01 p. m., when the 10-in. pins connecting the two sections of the eyebars suspending the new suspended span of the Quebec bridge to the ends of the cantilever arms were driven. This span is 640 ft. long center to center of end supporting bars, 88 ft. wide center to center of trusses and 110 ft. deep center to center of chords at the center of the span. When completed and ready for hoisting into its final position, it weighed practically 4,950 tons. The cantilever arms are each 580 ft. long, and with the placing of the suspended span the task of bridging a clear distance of 1800 ft.—the longest span in the world between main piers—had been completed. The two adjacent anchor arms are 515 ft. long and the depth over the main pier is 310 ft. from center of the main shoe to the center of the top chord connecting links.

DETAILS OF DESIGN

The trusses of the span have the top chords curved to a parabola, the depth at the hip being 70 ft. and at the middle of the span 110 ft. The web is a sub-panel Pratt system with main verticals compression posts, except the vertical hangers at the hip, which with the main diagonals are tension members. The main panels vary in length from 65 ft. in the end panels to 80 ft. for the panels at the center of the span. For the bottom chord throughout and for the first main tension diagonals of the web eyebars were used. All the other truss members were of built up construction. The top chords were pin-connected at all the main panel points with shop or field splices at the intermediate sub-panel points. Nickel steel was used throughout for all the main truss members and the top and bottom lateral systems, but the sway bracing and the minor web members, which carried no moving load stresses, were made of carbon steel. The greatest area of the top chord members was 434 sq. in., and in the center panel of the bottom chord eyebars 311.5 sq. in. The top and bottom lateral systems, as well as the sway bracing, were double intersection systems, designed to take both tension and compression in each member.

The manufactured length of the truss members was such

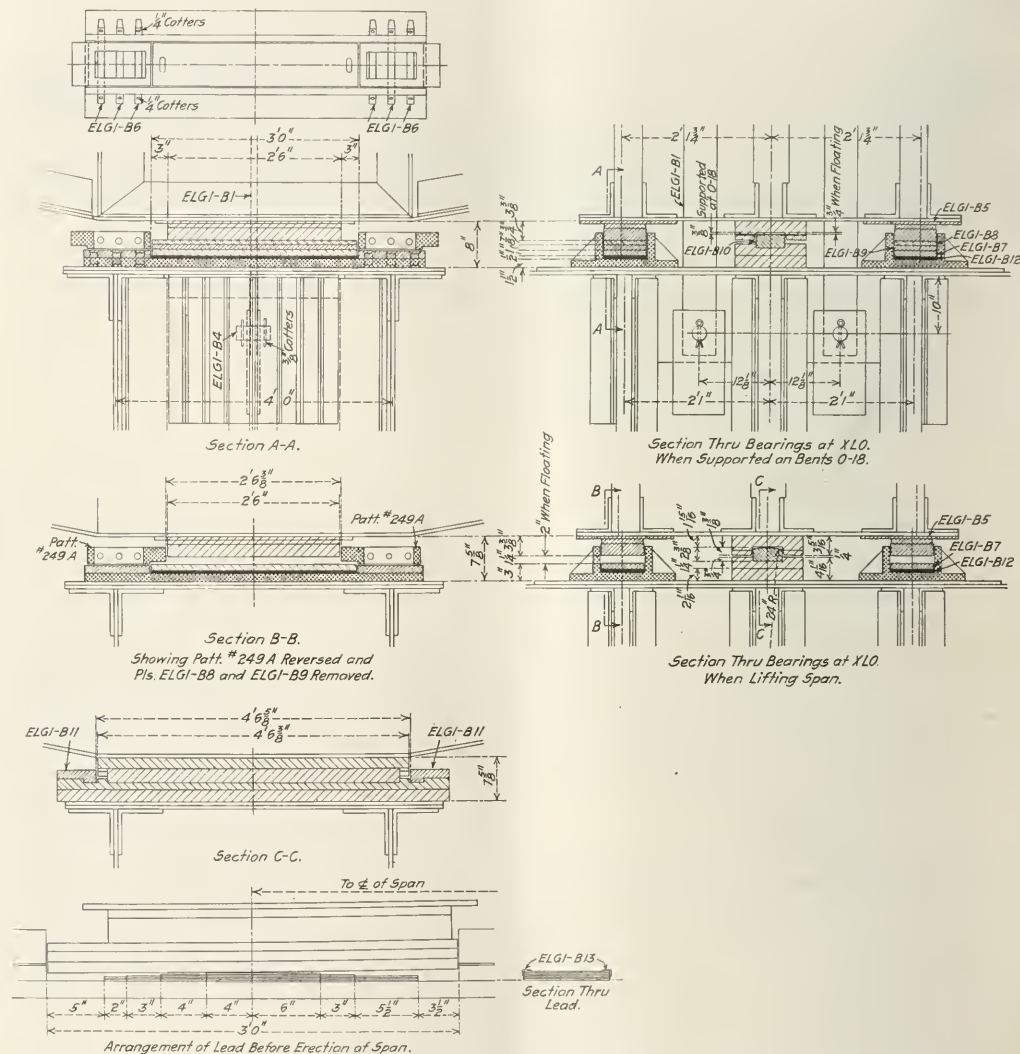
that after the span was erected and carrying its full live and dead load the trusses would have their geometrical shape, that is the main truss members would be straight between main panel points. For this reason the faced ends of the top chords, where these members are spliced in the field, would not come to a square bearing during erection. In order to obtain a square bearing at these points before riveting on the splice material, a special method of erection had to be adopted. Sand-jacks were placed on top of the outside columns of the staging bents at the main panel points, the main vertical posts of the span bearing on these jacks. At the sub-panel points, and between the inside columns of the staging bents and the floorbeams, wood blocking was used in place of the sand-jacks. The elevations of the bottom chord panel points during erection were calculated to suit the manufactured length of the truss members, or in other words the camber of the truss. The span being completely erected, except for the riveting of the top chord splices which had only been bolted up with 50 per cent of the field holes filled with bolts, the timber blocking between the floorbeams and inside columns of the staging and also between the sub-verticals and outside columns of the staging, was removed and the sand-jacks were lowered until the span rested on its bearings at the end staging bents which then carried the full dead load. The nuts on the bolts in the top chord splices were then loosened, and the bearing surfaces allowed to come squarely together; the lengths of the sub struts supporting the chords at the splices having been calculated so that the chords would be straight between main panel points for this condition. The chord splice material was then fully riveted.

BEARINGS RADICALLY CHANGED

The design of the bearings which on this occasion transferred the load of the suspended span to the lower supporting girders was radically different from the bearings of last year. After the intermediate falsework bents were removed and the span rested on the end bents at L0 and L18, the reaction of the span was borne by part bearings under the two outside ribs of the XLO joint, specially designed to take care of the expansion and contraction of 3 to 3½ in. at each

end of the span. This motion was due to a variation in temperature of 90 deg. F. or from a minimum temperature of 30 deg. to a maximum of 120 deg., which might have occurred during the summer months. These part bearings were also designed to accommodate the rotation of the XLO joint about the transverse axis of the joint, as the span deformed under the dead load stresses when the initial erection

The lower portion of the outside bearing was $4\frac{5}{8}$ in. thick and was built up of a loose $\frac{3}{4}$ in. top bronze plate, two loose steel plates, $\frac{7}{8}$ in. and 1 in. thick respectively, and a laminated section of sheet lead, 13/16 in. thick. These several plates and sheet lead filling were contained in a lower bed casting riveted to the supporting girder and were held against motion longitudinally by cast steel blocks, bolted in



Details of the Supporting Bearings. These Took the Place of the Rocker Bearings Used Last Year

camber was eliminated and the span rested entirely on the end supporting bents.

The upper portion of the outside bearing was $3\frac{3}{8}$ in. thick and was riveted to the bottom of the XLO joint. It was planed on the under surface and also on the edges to a width of $7\frac{7}{16}$ in. and to a length of 2 ft. 6 in. and slid when the span was expanding or contracting on the polished and paraffined surface of the top bronze plate of the lower portion of the bearing, at the same time being guided and contained by the planed sides of the lower bed casting.

the ends of the trough of the bed casting by three 1-in. diameter through bolts. Three-inch clearance was allowed between each end of the upper and lower portions of the bearing for longitudinal motion. The sheet lead filling, which was 13/16 in. thick before taking load, flowed under the reaction of the span and took care of the rotation of the XLO joint about its transverse axis as the members of the span changed their lengths under varying stresses and conditions. In order to prevent the sheet lead from squeezing out around the edges of the loose steel plates in the lower bed casting a

75,000 lb. each and passed through sheaves at the lower corners of the mooring trusses and from there up to a nine-part $\frac{3}{4}$ in. wire rope tackle which led back to the drums of the derrick hoists situated on the bridge floor at the ends of the cantilever arms. The span was pulled directly under its final position in the bridge by means of these ropes and the derrick hoists. The hanger lifting chains which raised the span were then lowered two feet and connected through slotted holes at the lower ends to the pins at the top of the short hanger links connecting to the supporting girders.

The mooring frames were made of two steel trusses braced together by one vertical plane of laterals and three horizontal transverse brace frames. This bracing was designed to take a transverse pull from each end of the suspended span of 300,000 lb. The mooring frames were connected to the cantilever arm floorbeams so that they could be raised so as not to obstruct the channel unnecessarily.

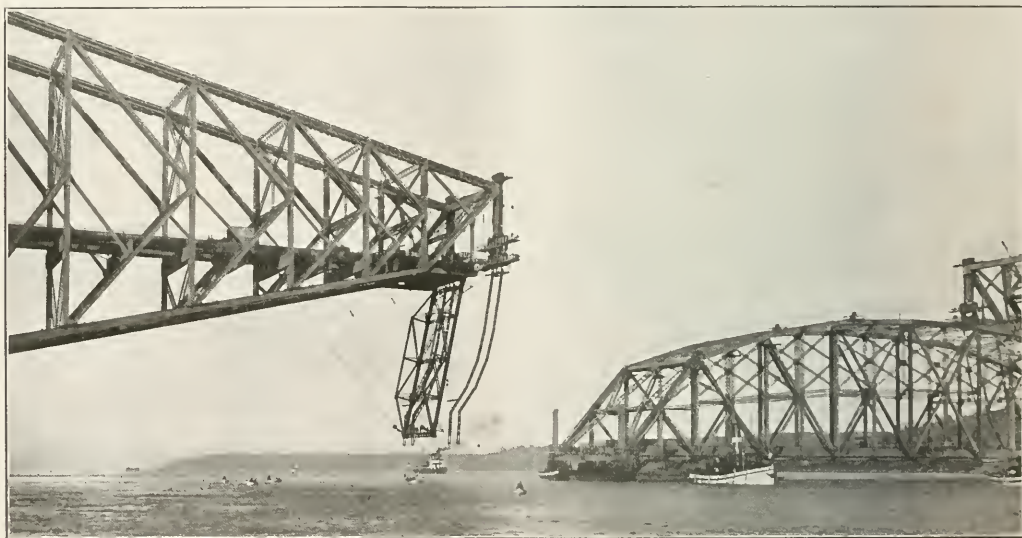
THE LIFTING APPARATUS

The lifting links or hanger chains were made of plates 28 in. wide, four plates to each chain and two chains to each corner of the span. These two hanger chains were

in. back to back of angles and 25 ft. long and were built up of two plate girders connected together by bearings, stiffening and pin connection diaphragms, and also cover plates.

The upper supporting girders at the CUO joint of the cantilever arm were designed in a similar manner to the lower supporting girders, the key bearing for the girders and the pin connections for the vertical hangers allowing turning about both the transverse and longitudinal axis of the supporting girders. With bearings of this design the suspended span could move in any direction under the influences of external forces arising from wind, pull of anchorage tackle or inequality in jacking during the hoisting of the span.

The jacking girders were located at the same elevation as the floor of the cantilever arm. They were hung from the upper supporting girders by stiff braced hangers which were pin connected at the upper and lower ends. At the lower ends these stiff hangers were attached to guides built of plates and angles which passed through the upper jacking girders and were riveted into the lower jacking girders. The position of the lower girders was therefore fixed and their distance from the panel point CUO did not change



The Span Arriving at the Bridge Site

attached to the lower supporting girder and were hung from the lower jacking girders, situated just above the bottom chords of the cantilever arms. The lower links of the chain were 31 in. wide instead of 28 in. to take the 15 in. pin connecting the chain to the stub of the lower supporting girder.

The material in all links was carbon steel except the two lower sections, which were silicon steel. These lower sections were made of silicon steel in order to provide a greater factor of safety against repeated bending stress due to swaying of the span under the action of wind and jacking forces. The bending stress in these links was higher and repeated more often than in the upper links of the chain. The links of the chain were connected together by 12 in. pins $12\frac{3}{4}$ in. long at each end and held in place by 14 in. dia. cast steel pin caps, threaded onto a $1\frac{3}{4}$ in. through pin bolt.

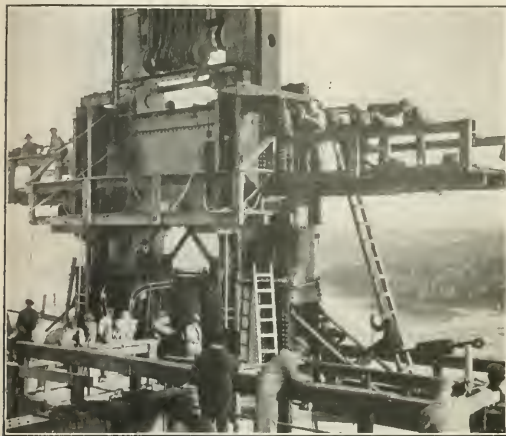
The hanger chains connected at the lower end to the supporting girders. These supporting girders were 6 ft. $11\frac{1}{2}$

during the jacking operations. The upper girders were the movable girders and slid up and down on the guides as the 1000-ton jacks were operated. These jacks were placed between the upper and lower jacking girders, two at each corner of the span, and did the work of lifting the span. In order to avoid binding of the jacks, due to the deflection of the jacking girders under load, the jacks were provided with rocker seats at their upper and lower bearings. They were located at the extreme end of the jacking girders where they bore against transverse diaphragms riveted into the jacking girders.

In addition to the hydraulic jacks, four follower-up screw jacks were provided at each corner of the span as a safety device in case anything should go wrong with the pumping system for the hydraulic jacks or the jacks themselves should fail to maintain the pressure necessary to hold the weight of the span while being lifted. These screw jacks also reacted against cross girder diaphragms in the upper and lower jacking girders. The screw itself was counter-

weighted so that practically all the friction due to its weight was eliminated. They were operated by hand from a platform in front of the lower jacking girder by means of a set of gearing so arranged that the two screws at each end of the girder were always at the same level. The counterweighting of the screws enabled the operator to turn them without difficulty and to follow the operation of the hydraulic jacks with equal speed and very little exertion.

The hanger lifting chains were guided between cross pin bearing diaphragms riveted into the jacking girders. The chains were bored every 6 ft. to receive a 12-in. dia. pin, while the cross diaphragms were bored for the same diameter of pin at 2 ft. centers. The clearance provided in the pin hole of the hanger chain was $\frac{1}{2}$ in. transversely and



The Jacking Girders Showing the Hydraulic Jacks and Safety Screws

$\frac{3}{8}$ in. longitudinally, and in the pin holes of the cross diaphragm 1 in. transversely and $1\frac{3}{4}$ in. longitudinally. This clearance was found to be ample to allow the pins to be driven without difficulty during jacking operations. Having the pin holes in the cross diaphragms at 2 ft. centers enabled the pin holes in the hangers to be bored at 6 ft. centers and at the same time accommodate the 2-ft. stroke of the jack.

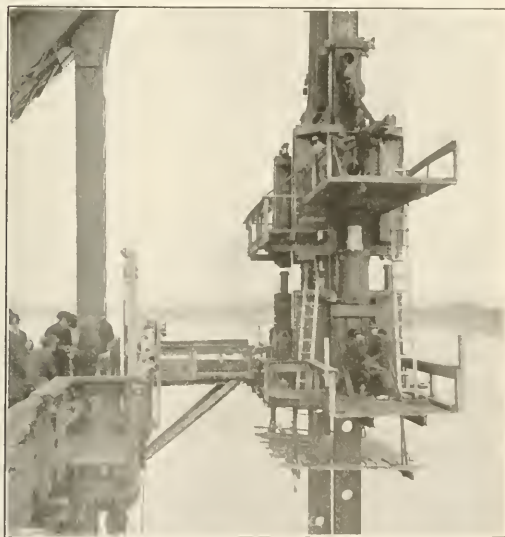
Each operation of the jacks lifted the span 2 ft. During the lifting or upward stroke a 12-in. pin engaged the hanger chains through the diaphragms in the upper jacking girders. At the finish of the stroke the pins were entered in the diaphragms of the lower jacking girders to engage the hanger chains. The upper pins were then removed, the pistons of the jacks and the upper girders lowered, the upper pins again entered, the lower pins removed, and the jacks again operated. As each 24-ft. length of hanger chain passed up through the upper jacking girders it was disconnected and removed. The jacking pins were counterweighted and balanced to enable them to be handled with facility by the men on the operating platform.

The jacks were supplied with water by a pair of direct acting double plunger pumps operated by compressed air and located on the center line of the bridge floor at the ends of the cantilever arms. By means of the set of controlling valves installed in front of the pumps the supply of water sent to each corner of the span was regulated and, in this manner with the aid of indicators placed in front of the valve operator which showed any difference in level between the lifting girders on each side of the bridge, the two corners of each end of the span were kept at the same elevation.

Another set of valves with similar indicators, situated on the operating platform in front of each set of jacking girders, controlled the water supply to each separate jack at one corner of the span.

RECORD OF FLOATING IN AND HOISTING OPERATIONS

The methods followed in floating were similar to those followed in last year's operations which were fully described in the *Railway Age Gazette* of September 22, 1916. The start was made at 5.45 on the morning of September 17, seven tugs being used in the operation. Ranges had been placed on the north shore at known distances apart so that the speed of the span could be ascertained at any time and increased or diminished as required to have the span arrive at the bridge site at the appointed time, when the current would be nearing zero velocity. The first jacking commenced at 9.10. Practically one complete operation was made before any load was taken by the lifting chains. Three more lifts were then made and the scows floated clear at 10.28. Twelve lifts were made during the first day and the span was hoisted a distance of 24 ft. Twenty-two lifts were made during the second day; twenty-six lifts during the third day, and fifteen lifts on the fourth day. The final connection between the eyebar suspenders at the ends of the span and those hanging down from the CUO joints of the cantilever arms, was made at 4.01 p. m. Sept. 20, 1917. At 4.51 p. m. of the same day, the load was transferred



End Elevation of the Jacking Equipment

from the lifting apparatus to the permanent hangers of the span.

The work was carried out under the supervision of the Board of Engineers, Quebec Bridge, composed of Messrs. C. N. Monsarrat (chairman and chief engineer), Ralph Modjeski and H. P. Borden. The St. Lawrence Bridge Company is the contractor for the superstructure, of which company Phelps Johnson is president, G. H. Duggan, chief engineer, Geo. F. Porter, engineer of construction, S. P. Mitchell, consulting engineer of erection, and W. B. Fortune, erection superintendent. The lifting apparatus which was furnished by the Watson Stillman Company of Aldene, N. J., performed its work with remarkable efficiency, no delays being experienced in the lifting.

General News Department

The Southern Railway has made a general increase, said to be 10 or 12 per cent, in the pay of clerks.

The Delaware & Hudson, beginning October 1, will run its passenger trains to and from the Canadian Pacific station in Montreal.

Large numbers of operators of the Great North Western Telegraph Company, of Canada, struck and left their work on Monday last.

The Delaware & Hudson has made a general increase in the pay of shopmen; said to be, for mechanics, from 45 cents an hour to 50 cents, and for helpers from 30 cents an hour to 33½ cents.

The State College of Pennsylvania announces special correspondence courses in elementary engineering subjects, established to meet the unusual demand for men in shops and manufacturing plants.

As the result of action taken by the Chicago committee of the Commission on Car Service on September 18, box cars unloaded in Chicago may be reloaded for movement over any railway in any direction, regardless of the ownership of the car.

At the Sheepshead Bay track, New York City, September 22, Louis Chevrolet, driving a Frontenac car, traveled 100 miles in 54 minutes; 20.98 seconds. This is said to be about two minutes better than the best previous record for that distance.

The New York, New Haven & Hartford is to employ both younger and older men in the operating department. The age limits, hitherto, 21 years to 35 years, will be, for firemen, 18 to 45 years; for trainmen, 18 to 50 years; and for other employees, 18 to 60 years.

Freighthouse employees in Kansas City returned to work on September 24, after having been out on strike for over two weeks. The railroads granted increased wages to the men, but refused to recognize the union, which was one of the principal demands of the strikers. All of the men were taken back except a few of the most active agitators.

The New York, New Haven & Hartford reports that for the six months ending June, 1917, the average revenue tons per loaded freight car mile was 18.23 tons, as compared with 16.61 tons in the corresponding period last year, and 15.55 tons in 1916. The company is continuing to impress upon the shipping public that it is its patriotic duty to load cars to their full cubic or weight capacity in order that freight may be handled more expeditiously and efficiently.

A passenger train of the Mobile & Ohio was stopped by robbers near Finger, Tenn., on the night of September 20, and the safe in the express car was blown open. The robbers compelled the engineman to move the express car several miles away from the rest of the train; and after completing their robbery, which, it is said, gave them little of value, they drove the engineman and firemen off the engine, and, taking charge of it themselves, escaped by running some miles ahead.

The Tidewater & Western, a three-foot gage railroad, extending from Bermuda, Va., westward to Farmville, 89 miles, being unable to earn a living, proposes to discontinue and dispose of its property. Authority to do this has just been granted by the Supreme Court of Appeals of the state of Virginia, in a decision which annuls an order of the Corporation Commission of that state, which order held that the railroad company could not dissolve. The court sustains the opinion of Commissioner Rhea, who dissented from the order forbidding the railroad to suspend operations. It is understood that the rails are to be sold to go to England.

In a recent letter to officers and employees of the Chicago & North Western, R. H. Aishton, president, announces that all in the service of the road will be given an opportunity to subscribe to a fund to be used for the purchase of Christmas

presents consisting of tobacco, pipes, candy, etc., for shipment to the members of the North Western company of the Thirteenth Engineers (Railways) now in France. Contributions will be received by the division superintendents of the road, and no subscription will be accepted in excess of 50 cents from any one person. With these presents a list of subscribers will be sent to the officers in charge of the company.

Negotiations between the Northern Pacific and its telegraphers were at a standstill at the time of writing because of the delay of one of the vice-presidents of the union in reaching St. Paul to assist in the conferences. The original demand of the men was for an increase of 18.5 per cent in the wage scale, but this request has been modified to provide for a 15 per cent increase, to be distributed on the basis of a minimum advance of \$10 a month. The company offers an increase of 8.32 per cent, and maintains that the granting of that advance will make the average wage scale on the Northern Pacific equivalent to the scale granted by the Union Pacific to its telegraphers on July 1, and in excess of the wages paid on many other roads in Northern Pacific territory.

The Senate Committee on Interstate Commerce on September 21 began a hearing on the Pomerene bill, giving the President power to fix prices on steel, iron and their products, wherever and whenever sold, either by producer or dealer, and to establish rules for the regulation of the method of production, sale, shipment, distribution, apportionment or storage thereof among dealers and consumers, domestic and foreign. Thus the bill provides for the regulation of sales to the public as well as to the government, and to the Allies. Joseph E. Davies, of the Federal Trade Commission, was the principal witness at the first session, and testified that between 75 and 80 per cent of the bituminous coal in the country had been contracted for at prices in excess of the mine prices fixed by the President a few weeks ago. As the contracts made before the President's order are allowed to stand, this leaves only from 20 to 25 per cent of the supply to be affected by the reduced prices.

Charles A. Prouty, director of the division of valuation, of the Interstate Commerce Commission, has filed a memorandum in the Texas Midland case, stating that while the solicitor's brief covers the legal points involved, the law of valuation is in such a plastic state that the decision of the commission will go far toward fixing the law in many instances, and he therefore confines himself to what he calls the practical considerations involved. Director Prouty says that while he fully concurs in the holding of the solicitor that the valuation act does not require the commission to find an ultimate value, it is still his conviction that an ultimate value for rate-making purposes should be stated, and that the full benefit of this valuation cannot be realized unless this be done. However, he says, this does not mean that any sort of the work now being done, or of the money now being expended, is thrown away because the commission is not required to establish at this time such ultimate value; for the facts are being prepared to be reported to Congress under the present act and "a final value can be quickly stated when Congress has determined by whom and possibly by what rule such value shall be determined."

Aerial Mail Routes Proposed

As a result of a conference between the Postmaster General and the Secretary of War, and with the approval of the President, Congress has been asked to authorize the Secretary of War to turn over to the post office department all military airplanes and motor vehicles not serviceable for military purposes, or which after the war may be dispensed with for military service. As soon as authority of Congress is secured and any airplanes are turned over to the Post Office Department, it is proposed to establish airplane mail routes in this country similar to those in Italy and France. An amendment to authorize this plan has been added by the House Post Office Committee to the Senate

bill, authorizing experiments in motor truck delivery by the Post Office Department in the vicinity of large cities in the United States.

Three Miles Up with 12 Passengers

Lieutenant E. Resnati, an Italian army aviator now practicing in America, flying near Newport News, Va., on September 20, rose to an altitude of 17,000 ft., and he carried 12 passengers. The machine used was a Caproni triplane, propelled by three engines of 160 hp. each. It has a wing spread of 70 ft.

Headlight Order Modified

The Interstate Commerce Commission has announced a further modification of its locomotive inspection rules, postponing from July 1 to January 1, 1918, the effective date of the requirement that new locomotives shall be equipped with electric headlights, and providing that for locomotives in service prior to that date the changes shall be made the first time they are shopped for general repairs after that date. All locomotives are required to be equipped by July 1, 1920.

Wage Increases on Canadian Pacific

Increased wages and improved working conditions were recently granted to enginemen, firemen and hostlers on the western lines of the Canadian Pacific. Passenger enginemen and firemen received an increase of 40 cents and 25 cents per 100 miles respectively, or approximately 10 per cent on the minimum rate for passenger service. The minimum day's work in passenger service was fixed at 100 miles or less, or five hours or less, except on the Mountain sub-division, where 6 hours and 40 minutes or less, or 100 miles or less, will constitute a minimum day. Overtime will be allowed pro rata at 20 miles an hour for a five-hour day, and 15 miles an hour for a day of 6 hours and 40 minutes.

Freight enginemen and firemen were granted an increase of 25 cents and 15 cents per 100 miles respectively, and an eight-hour day. The increase will amount to approximately five per cent for a minimum day. Enginemen in yard service were granted a 5 cents a day increase, and firemen 5 to 15 cents a day, according to the class of engine, in addition to the eight-hour day. Enginemen and firemen in transfer service were granted an increase of 5 and 10 cents a day respectively, and an eight-hour day. Hostlers were granted the eight-hour day, with a minimum of \$3.20 and \$3.35 per day, according to the territory, and with overtime at 33 1/4 cents and 35 cents an hour respectively. All arbitrators (except the preparatory time) will be paid at rates per hour to conform with the eight-hour day. About 4,500 men are affected by the increases, which will total about \$450,000 yearly.

Old Times

J. E. Alger, a locomotive engineer, writing to the Springfield Republican, says that the Boston & Albany was the first American railroad to pay bonuses in lieu of pensions. He says:

"I have been much interested in your articles in regard to railroading, especially that entitled 'No More Pensions for Boston & Albany Railroaders.' I thought that an account of the first payment of any money made by a railroad to an employee for services rendered, outside of his regular wages, might be of interest.

"The road was the Boston & Albany, and the man James M. Alger, an engineer, running between Worcester and Boston. He retired May 1, 1895, after 49 years' service. I have before me the letter from E. D. Hayden, vice-president, containing the vote of the directors, giving to him, in recognition of his long and faithful services, the sum of \$1,200. Not long afterward another old engineer received the same amount. A little later, William Bliss, president of the road, made a ruling that any employee who had been in the service of the road for 25 years, with a clean record, and who wished to retire, should receive a check for a year's pay. This continued until the New York Central took control, and the new form of pension took effect.

"It is interesting to note the conditions of a half century ago. James M. Alger took the Brookline (suburban passenger) train in 1852; and December 25, 1856, the season ticket passengers made him a present of \$125. Mr. Alger took the 7 a. m. out of Worcester, March 7, 1864, and April 4, the following month, the

passengers on the Brookline train, that he left the month before, sent him a \$500 treasury note as a testimonial. Those were the days when the engineer knew almost every passenger who rode on his train. Now we know a few, but in the hustle and rush, there is no time for a handshake, and hardly for a word of greeting. . . ."

Turin to London, at 90 Miles an Hour

On Monday last, September 24, Captain Marquis Giulio Laureati, of the Italian air service, carrying one passenger, flew from Italy to England without a stop. He left Turin at 8:28, Italian time, and landed at Hounslow, a suburb of London, at 2:50 p. m., 656 miles in 7 hours 22 minutes, or an average rate of approximately 90 miles an hour. Captain Laureati flew an Aila machine, and carried two machine guns.

From Turin he followed the railroad as far as Susa, on the Italian frontier. Crossing the Alps (Mont Cenis) at an altitude of nearly 12,000 feet, he passed over Lanslebourg and followed the railroad from Modane. He passed to the east of Paris, and crossed the English Channel in 15 minutes. He carried an autograph letter from his King to King George. During the flight he took food from a bottle fastened inside his coat and fitted with a rubber tube like an infant's feeding bottle. On August 26 Laureati flew from Turin to Naples and back, a distance of 920 miles, without a stop.

Progress on Alaska Railroad

The deficiency appropriation bill passed by the House of Representatives on September 19, and then sent to the Senate, contains provision for an additional appropriation of \$4,000,000 for the construction of the Alaskan railroad. In connection with this item the following statement as to the progress of the road, up to September 10, by H. A. Meyer, assistant to the Secretary of the Interior, was placed in the Congressional Record:

"The Alaska Northern Railroad, purchased by the government and running from Seward to mile 71, at Kern Creek, is being rehabilitated. The first 25 miles from Seward are completed and able to handle any traffic. From mile 25 to mile 71 the road is being rehabilitated, but is usable. From mile 71 to Potter Creek, mile 100, a distance of 29 miles, extraordinarily heavy work is encountered requiring blasting through practically solid rock. Here the line runs along Turnagain Arm, and in this district the grading work has made some progress.

"Rail has been laid and the road is in operation southward from Anchorage, at mile 114, to mile 100, and northward to mile 175, with a branch at Matanuska, 38 miles from Anchorage, to Chickaloon, the heart of the Matanuska coal fields, a distance of 37 miles. It will thus be seen, with the exception of 29 miles of work along Turnagain Arm, rail has been laid from Seward to Chickaloon, a distance of 189 miles, and 23 miles additional on the main line. All efforts are now being made toward closing this gap. This it is hoped to do in 1918.

"Northward on the main line from mile 175 to mile 230 grading work is in progress and will be completed this season. Track laying here will proceed as rapidly as the weather will permit. From mile 230, Talkeetna, to mile 250, Dead Horse Hill, the grading is well advanced, but will not be finally completed until 1918. From mile 250 to mile 260 the right of way has been cleared. From mile 260 into and through Broad Pass, engineering and preliminary work has been done to mile 360. At mile 360 the Nenana coal field is reached, and from this point to the town of Nenana, at mile 415, 9 miles of track have been laid, 32 miles of grading have been practically completed, and 14 miles have been cleared and partially graded. From mile 415 to Fairbanks, at mile 470, the clearing has been completed and grading is underway.

"It will thus be seen that to date 192 miles of rail are in operation.

"With the additional funds requested it is the intention to lay rail along Turnagain Arm, and from Nenana southward to the Nenana coal fields. This work should be completed in 1918, and when this is done, there will be two units of operation, viz., from Seward into the Susitna Valley, with a branch to the Matanuska coal fields, which will permit of the shipment of Matanuska coal to tidewater at Anchorage and Seward, and from Fairbanks to the Nenana fields, so that shipments can also be made from the Nenana fields to the country tributary to Fairbanks."

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY, 1917

Name of road.	Average mileage operated.	Operating revenues			Operating expenses			Net operating ratio.	Railway income acc'rals.	Increase (or loss) comp. with last year.
		Freight.	Passenger.	(Inc. total.)	Way and equip. structures.	Maintenance of way and equip. structures.	Traffic.			
Ann Arbor.....	293	\$207,367	\$52,356	\$279,723	\$15,411	\$31,406	\$6,726	63.67	\$101,333	\$88,229
Atlantic City.....	170	125,971	355,360	481,331	28,373	28,373	4,664	51.17	11,000	231,521
Baltimore & Ohio.....	4,937	9,124,634	1,732,416	11,857,050	1,450,414	2,028,549	209,362	3.02	3,082,786	27,371,723
Bell Ry. Co. of Chicago.....	431	2,155,500	81,555	2,237,055	42,354	57,392	7,298	77.75	17,766	35,958
Chicago, Indianapolis & Louisville.....	654	498,900	183,438	682,338	747,272	148,534	19,036	71.83	210,484	175,546
Chicago, Terre Haute & Southwestern.....	375	307,032	18,797	325,829	341,131	381,198	7,433	68.41	105,567	42,165
† Cincinnati, Hamilton & Dayton.....	137	87,670	1,132	88,802	31,859	36,555	3,685	77.77	17,015	17,015
Detroit, Toledo & Western.....	197	1,055,456	292,790	1,348,246	160,680	289,191	3,831	70.31	18,835	30,725
Duquesne, Erie & Western.....	492	211,889	14,837	226,726	76,080	45,318	10,149	78.35	86,820	17,900
Kansas City, Shreve & Orient.....	222	91,844	15,331	107,175	19,222	24,939	5,271	78.35	314,323	91,844
Kansas City, Mexico & Orient of Texas.....	745	74,454	17,315	91,769	13,372	25,633	3,855	104.33	5,000	9,186
Kansas City Southern.....	755	758,355	153,552	911,907	90,446	157,930	25,228	62.82	50,659	340,749
Kansas City Terminal.....	23	45,117	1,143	46,260	8,354	14,133	2,060	65.16	371,850	27,636
Lehigh Valley.....	1,646	4,099,793	168,240	4,268,033	79,372	79,372	10,306	69.65	1,503,990	227,271
Long Island.....	1,646	4,099,793	168,240	4,268,033	79,372	79,372	10,306	69.65	1,503,990	227,271
Maryland.....	2,306	1,725,125	351,989	2,077,114	310,538	338,822	62,131	78.78	1,106,225	936,638
Oregon Short Line.....	2,052	1,725,125	351,989	2,077,114	310,538	338,822	62,131	78.78	1,106,225	936,638
Oregon-Washington R. R. & Nav. Co.....	2,052	1,725,125	351,989	2,077,114	310,538	338,822	62,131	78.78	1,106,225	936,638
Pere Marquette.....	2,248	1,725,125	351,989	2,077,114	310,538	338,822	62,131	78.78	1,106,225	936,638
Philadelphia & Reading.....	2,248	1,725,125	351,989	2,077,114	310,538	338,822	62,131	78.78	1,106,225	936,638
Philadelphia & Reading, & St. Louis.....	2,248	1,725,125	351,989	2,077,114	310,538	338,822	62,131	78.78	1,106,225	936,638
Pittsburgh, Shawmut & Northern.....	204	137,782	5,523	143,305	19,832	43,844	4,699	117.74	17,324	1,885,558
Pittsburgh, Shawmut & Northern.....	204	137,782	5,523	143,305	19,832	43,844	4,699	117.74	17,324	1,885,558
St. Louis, San Francisco & Texas.....	143	73,656	12,048	85,704	22,811	9,882	2,145	79.61	18,933	4,827
St. Antonio & Aransas Pass.....	732	227,578	91,341	318,919	340,737	55,087	54,689	89.02	42,423	11,406
St. Louis & San Antonio.....	143	73,656	12,048	85,704	22,811	9,882	2,145	79.61	18,933	4,827
Utah & Delaware.....	128	43,266	60,074	103,340	11,738	3,152	3,152	88.32	60,532	4,527

SEVEN MONTHS OF CALENDAR YEAR, 1917

Name of road.	Average mileage operated.	Operating revenues			Operating expenses			Net operating ratio.	Railway income acc'rals.	Increase (or loss) comp. with last year.
		Freight.	Passenger.	(Inc. total.)	Way and equip. structures.	Maintenance of way and equip. structures.	Traffic.			
Alabama & Vicksburg.....	143	\$205,923	\$56,940	\$262,863	\$15,411	\$31,406	\$6,726	63.67	\$101,333	\$88,229
Alabama Great Southern.....	233	1,055,456	292,790	1,348,246	160,680	289,191	3,831	70.31	18,835	30,725
Ann Arbor.....	293	\$207,367	\$52,356	\$279,723	\$15,411	\$31,406	\$6,726	63.67	\$101,333	\$88,229
Arizona Eastern.....	378	2,123,559	369,449	2,493,008	267,457	450,335	18,891	58.70	1,336,215	1,336,215
Archibon, Topeka & Santa Fe.....	8,645	55,863,570	19,016,411	74,879,981	8,617,900	13,222,289	1,349,445	62.38	29,600,684	4,411,347
Atlanta & West Point.....	93	466,866	337,216	804,082	102,170	166,162	14,233	73.15	31,568	197,673
Atlanta, Birmingham & Atlantic.....	167	1,721,788	156,467	1,878,255	232,018	217,488	30,411	75.89	69,385	29,318
Atlantic & St. Louis.....	170	655,936	959,432	1,615,368	161,004	214,880	9,893	126.69	258,600	363,448
Atlantic City.....	4,777	16,777,593	2,562,992	19,340,585	1,788,425	2,891,424	418,655	67.64	3,430,216	16,649
Baltimore & Ohio.....	4,937	9,124,634	1,732,416	11,857,050	1,450,414	2,028,549	209,362	3.02	3,082,786	27,371,723
Baltimore & Ohio Chicago Terminal.....	601	57,360,989	8,656,572	66,017,561	1,126,064	1,870,786	262,638	77.59	17,529,399	150,629
Baltimore & Ohio, & Atlantic.....	601	57,360,989	8,656,572	66,017,561	1,126,064	1,870,786	262,638	77.59	17,529,399	150,629
Bangor & Ansonia.....	632	2,084,484	440,145	2,524,629	361,611	436,332	29,641	83.82	153,482	174,980
Belt Ry. Co. of Chicago.....	31	2,165,127	2,123,236	4,288,363	160,220	306,751	9,701	102.18	105,000	764,497
Bessemer & Lake Erie.....	205	6,076,397	301,133	6,377,530	618,831	1,693,143	79,603	71.04	1,859,105	1,643,858
Birmingham & Gulf.....	36	1,729,150	36,008	1,765,158	217,590	86,656	25,089	95.98	1,076,628	128,441
Birmingham & Northern.....	205	20,122,942	9,426,919	29,549,861	217,590	86,656	25,089	95.98	1,076,628	128,441
Boston & Maine.....	235	2,165,127	2,123,236	4,288,363	160,220	306,751	9,701	102.18	105,000	764,497
Buffalo & Susquehanna R. R. Corp.....	222	916,869	9,426,919	10,343,788	155,204	272,577	12,354	81.60	179,769	146,518
Buffalo, Rochester & Pittsburgh.....	586	7,151,931	121,954	7,273,885	219,020	374,923	208,115	79.41	1,679,702	215,400
Canadian Pacific Lines in Maine.....	233	1,729,150	36,008	1,765,158	217,590	86,656	25,089	95.98	1,076,628	128,441
Carolina, Ohio & Ohio.....	217	2,076,481	9,066	2,085,547	155,204	272,577	12,354	81.60	179,769	146,518
Central of Georgia.....	1,918	5,536,541	2,067,615	7,604,156	1,126,064	1,870,786	262,638	77.59	17,529,399	150,629
Central of New Jersey.....	684	15,314,448	3,764,757	19,079,205	1,718,619	3,794,323	208,115	68.58	6,584,411	1,109,362
Central New England.....	301	2,289,150	205,240	2,494,390	353,323	298,306	8,040	71.04	1,859,105	1,643,858
Central Vermont.....	441	1,705,652	51,319	1,756,971	353,383	258,468	53,649	63.17	1,157,854	131,400
Chesapeake & Ohio.....	2,379	2,498,034	4,062,423	6,560,457	381,994	627,448	40,949	70.99	8,839,957	770,746
Chicago & Alton.....	1,053	8,168,916	2,341,533	10,510,449	1,127,411	2,214,015	275,958	78.40	3,781,516	3,024,060
Chicago & Eastern Illinois.....	1,131	9,016,757	1,971,878	10,988,635	1,336,515	2,940,680	191,261	76.42	2,561,719	2,088,637
Chicago & Erie.....	8,708	4,255,688	3,399,298	7,655,000	415,448	656,206	41,548	71.45	1,432,411	2,181,925
Chicago & North Western.....	8,108	3,831,534	1,030,773	4,862,307	330,633	421,213	121,339	71.45	1,432,411	2,181,925
Chicago, Burlington & Quincy.....	5,350	12,907,806	748,485	13,656,291	974,888	1,584,378	78,153	75.37	13,124,961	1,281,533
Chicago, Detroit & Grand Trunk.....	1,496	6,365,889	2,018,662	8,384,551	1,194,336	3,204,777	359,647	66.55	2,160,221	372,000
Chicago Great Western.....	654	3,577,875	1,141,618	4,719,493	429,238	897,130	138,126	68.72	1,607,414	1,348,234
Chicago, Indianapolis & Louisville.....	654	498,900	183,438	682,338	747,272	148,534	19,036	71.83	210,484	175,546
Chicago Junction.....	13	1,869,174	219,755	2,088,929	173,317	182,759	18,759	87.92	224,894	21,430
Chicago, Milwaukee & St. Paul.....	10,255	44,152,535	11,000,000	55,152,535	10,076,610	19,076,610	1,041,433	82.63	57,900	1,930,283
Chicago, Rock Island & Gulf.....	479	1,540,592	437,231	1,977,823	508,575	713,321	72,317	66.84	371,516	157,083

† Merged with B. & O. as of July 19, 1917.

Coal Production

The weekly report of the Geological Survey on the production of bituminous coal for the week ended September 8 shows 74.8 as the ratio of tonnage produced to full time capacity for the mines reporting, as compared with 72 for the preceding week. Coal originated by 17 of the principal bituminous carriers amounted to 111,874 cars, or 2,000 more cars than for any other week since July. The greatest increase was in Pennsylvania and Ohio, which, the report says, corroborates the inference drawn that the priority order on lake shipments is having its effect. Reports of cars loaded on 90 roads in the week ended September 15 show a gain of but .5 per cent over the week ended September 1. The improvement, the report says, is local and largely in the districts affected by the priority order. The percentage of full time output lost on account of car shortage by all mines reporting dropped from 10.3 to 6.5. Practically every district reporting exhibited a better car supply. The percentage lost on account of the labor shortage and strikes was 7.8, as compared with 6.9 in the preceding week.

Foreign Born Subscribers to the Liberty Loan

To ascertain the extent to which railroad employees of foreign birth subscribed to the first Liberty Loan, a special investigation has been completed on the directly operated lines of the Pennsylvania Railroad East of Pittsburgh and Erie. The result of this inquiry shows that out of a total of 160,127 employees, in all departments, 25,827 were born in foreign countries. There were among all the employees—both native and foreign born—52,782 subscriptions, totaling more than \$3,400,000.

Nearly one in three of the foreign-born employees was found to have been a Liberty Bond purchaser. The exact number of subscribers of alien birth was 8,146, or within two per cent of the proportion of employees of American birth who subscribed.

The inquiry also brought out the fact that there are in the service of the Pennsylvania Railroad men of 42 different nationalities, besides native-born Americans; and members of 30 alien races were included among the buyers of Liberty Bonds.

The Italian race furnished the largest number of foreign-born employees on the Pennsylvania Railroad, the number being 8,365, or practically one-third of all the alien born. Thirty-two per cent of the Italians, or a total of 2,725 employees, bought Liberty Bonds.

The inquiry also brought out the important fact that since the fall of 1914 the Pennsylvania Lines East of Pittsburgh have sustained a net loss of 7,977 employees of foreign birth, as a result of men returning to their native countries for military service, or obtaining employment elsewhere in America, attracted by the higher wages offered by industries which have been able to take advantage of economic conditions.

"Sailing" on Dry Land

The New York, New Haven & Hartford, in announcing its plan for sailing days for package freight, to be started on the first of October, explains the proposal as follows:

These sailing or shipping dates will be scheduled and regularly maintained. When a car, for example, is scheduled to leave a freight house on Wednesday afternoon at 3 o'clock for another designated point, that car will leave whether it is fully loaded or not. The shipper will know that his freight will leave that day; and he will know when the car is due at its destination, and he can advise the consignee accordingly.

This plan provides for direct shipments between various points, preventing the delay at transfer points where heretofore I. C. I. freight has been generally sent for reclassification. One of the principal causes of delay at the present time is the shortage of labor at freight houses, and the new plan will largely eliminate this. It is estimated that at least 1,200 less cars a week will be required to move the I. C. I. freight than under the old system.

Earlier closing hours will be established, and some cars will close as early as 12 o'clock noon, while others will close at 1 p. m., 2, 3 and 4. Shippers will be fully informed as to scheduled closing hours and shipping days, and printed schedules will be provided. The plan will be put into operation first in the larger cities on the eastern end of the line, Boston, Providence, Pawtucket, Woonsocket, Worcester, etc. Advance notice will be given shippers as to the time the new method will become effective.

The road has also adopted a suggestion of the Railroads' War Board that waybills accompany freight to prevent loss or delay of small shipments en route.

New York City Rapid Transit

The New York Public Service Commission, First district, reports that it is the hope of the commissioners to place the Lexington Avenue and the Seventh Avenue subways, New York City, in operation before the end of the year, and also to extend the operation of the Broadway subway from Fourteenth street north to Times Square. The completion of these lines will effect the greatest transit relief ever afforded to residents of Manhattan and the Bronx at any one time. It will mean the doubling (from four to eight tracks) of the subway facilities north of Forty-second street and their trebling, for most of the distance in Manhattan, south of Forty-second street. The Lexington Avenue and Seventh Avenue subways are to be operated by the Interborough Rapid Transit Company, and the Broadway subway by the New York Consolidated Railroad Company.

Automatic Stops on the San Francisco-Oakland

L. E. Jones, signal engineer of the San Francisco-Oakland Terminal Railways, in a paper presented before the Pacific Railway Club at San Francisco, August 9, reviewing the history of automatic signaling apparatus on high speed electric railways, says that the use of automatic train stops on that road has been so satisfactory during the six years since the first installation was made that the stops were introduced in connection with the interlocking signals of the company's principal terminal in 1916, when the tracks and signals were reconstructed. The stops were installed on about three miles of the line (double track) in 1910. Most of this line is on trestles in the bay, and heavy fogs are frequent. The terminal where the stops have been introduced is also on trestles, and derails, arranged in the ordinary way, cannot be used. Experience with the stops in this terminal for about one year has proved satisfactory, and at least one serious collision has been avoided by the automatic application of the brakes on a train of which the motorman had a mental lapse. He overlooked a signal when he was moving directly toward a heavily loaded passenger train at a speed of about 25 miles an hour.

These stops are described in the Signal Dictionary, page 113.

Society of Railway Financial Officers

The eleventh annual meeting of the Society of Railway Financial Officers will be held at the Jefferson hotel, St. Louis, Mo., on October 16, 17 and 18. The program includes an address of welcome by Richard S. Hawes, vice-president of the St. Louis Chamber of Commerce; an address by Frank Trumbull, chairman of the Railroad Executives' Advisory Committee, and a report on the Clearing House Committee, by T. H. B. McKnight, all on Tuesday; a paper on "Handling Liberty Loan Subscriptions," by R. W. Morrison, assistant treasurer, Pennsylvania Lines West; an address by John E. Lonsdale, president of the National Bank of Commerce of St. Louis, and vice-president of the National Association of Owners of Railroad Securities; a paper on "Pension Systems for Smaller Transportation Companies," by J. P. Reeves, treasurer, Chicago & Eastern Illinois; a paper on "Wartime Economics," by B. F. James, secretary and treasurer of the Colorado & Southern, and an address on "The Y. M. C. A. at the Front," by Rubens Humphrey, secretary, St. Louis Railroad Y. M. C. A., on Wednesday; and a paper on "Women for Treasury Department Work," by A. B. Jones, local treasurer of the Chicago & North Western, on Thursday.

Roadmasters Elect Officers

At the closing session of the convention of the Roadmasters' and Maintenance of Way Association at Chicago on Thursday morning of last week, the following officers were elected for the ensuing year: President, A. Grills, general roadmaster, Grand Trunk, St. Thomas, Ont.; first vice-president, J. B. Oatman, roadmaster, Buffalo, Rochester & Pittsburgh, Du Bois, Pa.; second vice-president, J. W. Powers, supervisor, New York Central, Oswego, N. Y.; secretary, P. J. McAndrews, roadmaster, Chicago & North Western, Sterling, Ill.; treasurer, Coleman

King, supervisor, Long Island, Jamaica, N. Y.; members of executive committee, four years, George Beckingham, superintendent of track, Grand Trunk, Montreal, Que.; J. P. Corcoran, roadmaster, Chicago & Alton, Bloomington, Ill.; three years, A. M. Clough, supervisor, New York Central, Batavia, N. Y.; W. Wiltsee, principal assistant engineer, Norfolk & Western, Roanoke, Va.; two years, J. S. McGuigan, roadmaster, St. Louis-San Francisco, St. Louis; one year, F. J. Meyer, roadmaster, New York, Ontario & Western, Walton, N. Y.

Chicago was selected as the place for holding the next convention, although the executive committee was given authority to change this location if conditions warranted.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hone, C. R. K. of N. E. 143 Liberty St., New York. Next meeting, October 16-17, St. Louis.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 16-18, 1917, Chicago.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—Tom Lebon, The Lebon Company, Chicago. Meetings with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, March, May, July and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CINCINNATI RAILWAY CLUB.—H. Boulet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 568 Union Arcade Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

INVESTMENT BANKERS' ASSOCIATION OF AMERICA.—Frederick R. Fenton, 11 W. Monroe St., Chicago. Annual convention, October 1-3, 1917, Baltimore, Md.

MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 16-18, 1917, Cleveland, Ohio.

NATIONAL ASSOCIATION OF RAILWAY COMMISSIONERS.—Jas. B. Walker, 120 Broadway, New York City. Next annual convention, October 16, 1917, Washington, D. C.

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

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meetings, 3d Friday in month, except June, July and August, 29 W. 34th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Geo. A. J. Hochgrebe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PACIFIC RAILWAY CLUB.—W. S. Wollner, Assistant to Chief Engineer, Northwestern Pacific R. R., San Francisco, Cal.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial Annex Hotel, Pittsburgh.

RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, office of the president's assistant, Seaboard Air Line, Norfolk, Va. Next meeting, October 24, 1917, Planters Hotel, St. Louis, Mo.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

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

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—L. W. Cox, N. & W., Philadelphia, Pa. Next annual convention, October 16-18, St. Louis, Mo.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—J. O. Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday in month, except June, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.

TRAFFIC CLUB OF CHICAGO.—C. R. Sierke, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, 2d Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—I. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

WESTERN SOCIETY OF ENGINEERS.—Edgar S. Nethercut, Acting Secretary, 1735 Monadnock Block, Chicago, Ill. Regular meeting, first Monday in month, except January, July and August. Extra meetings generally on other Monday evenings except in July and August.

Traffic News

A hearing before the Interstate Commerce Commission on claims for loss or damage of grain was resumed at Chicago, Ill., on September 18, before H. C. Wilson, attorney examiner.

The Montana Railroad and Public Service Commission, in a decision announced on September 14, denied the application of the railroads of that state for an increase of 15 cents a ton in coal rates.

The Baltimore & Ohio has filed with the Interstate Commerce Commission a tariff providing that coupons of mileage books may be used by passengers for the payment of excess baggage charges, and for meals in dining cars, and telegrams.

In passing the deficiency appropriation bill on September 26 the Senate increased the appropriation for the transportation of the army and its supplies from \$350,000,000, as provided in the House bill, to \$413,567,777. The bill was then sent to conference.

The Southern Classification Committee has announced an extensive docket of proposed changes to be made in Southern Classification No. 43, on which shippers will be given an opportunity to be heard at a hearing at the Sinton hotel, Cincinnati, beginning on October 9.

The New York State Public Service Commission, Second district, announces that substantially all intrastate freight rates west of Buffalo and Salamanca have been advanced to the basis provided for in the orders of the Interstate Commerce Commission, increasing interstate rates on the 15 per cent application of the railroads.

The Baltimore & Ohio has accepted no freight for Baltimore, except foodstuffs and the other articles usually excepted, since September 21, whether carload or less than carload; and on Tuesday of this week it was said that 1,500 cars were still waiting. There is a shortage of men to unload the cars, and consignees have been slow in unloading bulk freight.

The Southern Pacific reports deciduous fruit shipments from California, from last November up to August 27, as totaling 9,903 carloads, the largest movement in history. As compared with previous years the records read: For 1914, 8,044 cars; for 1915, 7,242; for 1916, 9,556; for 1917, 9,903. The grape movement is now on and a recent estimate placed the grape movement from California this year at 11,000 cars.

During the period extending from the opening of the Panama Canal for commercial traffic in August, 1914, to the end of June, 1917, 3,751 vessels with cargoes aggregating 15,339,000 tons passed through it. The traffic from the Pacific ocean to the Atlantic was considerably heavier than that in the other direction; 1,905 vessels with a cargo tonnage of 8,702,300, making the trip from the Pacific to the Atlantic, and 1,846 ships with a cargo tonnage of 6,636,800, making the trip through the canal to the Pacific. Nearly one-half of this total traffic was handled in the year ending June 30, 1917.

The Missouri Public Service Commission has issued an appeal to shippers and carriers asking for the utmost conservation of the car supply. It says: Buyers should order by maximum car loads instead of customary trade units; should place their orders in advance as far as possible so that shippers may be able to double load the cars; should promptly unload all freight, and not take advantage of the full free time granted. Shippers should order only the cars actually needed, and should specify the smallest size cars necessary to carry the loads. Shipments to the same destination should be combined in one car as often as possible.

The Kansas Public Utilities Commission on September 17 filed a formal answer in the United States District Court at Topeka, Kan., to the charges of the carriers relative to the two-cent passenger fare law in force in that state. On August 24, the

Atchison, Topeka & Santa Fe and other railroads applied for an injunction to prevent the utilities commission from interfering with the filing of higher rates, setting up that the Kansas two-cent fare law of 1911 was confiscatory and discriminatory against interstate traffic. The testimony of the Santa Fe, which was typical, showed that the road earned only 1.96 per cent on Kansas passenger business in 1916.

In order to facilitate the direction and proper ticketing of passengers to the military and naval posts throughout the country, the passenger traffic department of the Illinois Central has prepared a bulletin containing essential information concerning military posts located on that road and in adjacent territory served by its immediate connections, a map showing the location of the military posts, and a list of all other encampments. With reference to the encampments on or near the Illinois Central, the bulletin contains information relative to the character of each camp, its location, also the fare from large cities in the vicinity, and directions concerning the routing of passengers.

Reports received by R. H. Aishton, president of the Chicago & North Western, and chairman of the Central Department Committee of the Railroads' War Board, show that from the beginning of the war up to September 22, passenger train service in the 15 states in the department has been reduced to the extent of 9,201,327 train-miles per year. Through the reductions so far made in the central department, 1,660 men and 320 locomotives have been made available for other service, and there is an annual saving of 989,359 tons of coal, and 203,097 barrels of fuel oil. In most cases where a train has been annulled additional coaches have been added to other trains. In some cases mixed trains are doing the service which had been given by regular passenger trains. No transcontinental trains have been taken off.

The Japan Travel Association has recently organized for the purpose of promoting and stimulating interest in trade and travel between Japan and America and to disseminate information to that end through the co-operation of railway and steamship agencies in all parts of America and the Orient. The association will publish a monthly periodical, entitled "Japan," which will be distributed free to all important ticket agencies in the United States. The officers of the association are: President, George H. Corse, Jr., foreign passenger agent of the Union Pacific System, Chicago; vice-president, L. H. Nutting, general eastern agent, Southern Pacific, New York; treasurer, L. E. Bemiss, agent, Toyo Kisen Kaisha, San Francisco, Cal.; and secretary, James K. Steele, editor of "Japan," San Francisco, Cal.

The oppressively hot weather of late July incited travel to mountain, lake and ocean resorts. Hotels and transportation companies have made up in part in August for slender earnings in the early summer, but the short summer resort season comes to an abrupt close at Labor Day. There seems to be no good reason for the tradition that Labor Day must mark the close of vacation activities. September and October furnish the most equable and agreeable weather in our latitude. A well organized effort to establish a new tradition by exploiting the advantages of early fall travel and resort enjoyments, would doubtless bring good returns. The National parks and other Western resorts seem to have fared better than the Eastern. Estes park has had capacity business, and while Yosemite and Yellowstone have had smaller patronage than last season, Glacier National park has had a substantial increase. Commercial travel continues very heavy.—*American Express Bulletin*.

Every hog that is killed in transit, due to overcrowding or mishandling, means a loss now of about \$30, and the Department of Agriculture advises the following simple precautions: 1. When hogs are very hot, during or after a drive, never pour cold water over their backs. 2. Before loading, clean the car and bed it with sand, which during dry, hot weather should be wetted down thoroughly in the daytime. In hot weather it is advisable to suspend burlap sacks of ice from the ceiling of the car to reduce the temperature, and, incidentally, to sprinkle the animals with cool water. Ice placed in sacks on the floor is not accessible to all the hogs. 3. Crowding hogs in a car during warm weather is a prolific source of mortality. 4. The feeding of corn before and during shipment in hot weather should be reduced to a minimum. Oats are preferable. The maximum

maintenance requirement of hogs in transit for 24 hours is one pound of grain a hundredweight or approximately three bushels of corn to a car. Thousands of bushels of corn have been wasted in live-stock cars.

The Reconsignment Waste

The Bureau of Markets of the United States Department of Agriculture, reporting on an inspection of the Potomac Yards (Alexandria), Virginia, for 30 days last summer, reports that 236 cars of perishable commodities were held on the average of 44 hours each by shippers or consignees, before issuing orders to move the cars. No car held for less than 24 hours was counted. A car of cabbage was held 78 hours; a car of watermelons, 84 hours; a car of cucumbers, 104 hours; a car of potatoes, 128 hours; and a car of tomatoes, 213 hours.

Shippers to Give Active Assistance to Chicago Committee

At the meeting of the executive committee of the Chicago committee of the Chicago Commission on Car Service on September 10, the names of those who have been selected to represent the National Industrial Traffic League and the Chicago Association of Commerce on various sub-committees were announced. F. T. Bentley, traffic manager of the Illinois Steel Company, will represent the National Industrial Traffic League, and H. C. Barlow, traffic director of the Chicago Association of Commerce, will represent his organization on a committee on accumulation and embargoes. This body will have power to place embargoes when necessary to prevent the loading and delivery of cars to industries or individuals failing to unload cars within a reasonable time. This committee will be assisted by a committee on the delays in loading and unloading cars of which W. J. Womer, traffic manager of the Consumers' Company, Chicago, is a member representing the National Industrial Traffic League. In addition, R. C. Ross, traffic manager of J. T. Ryerson & Son, Chicago, will represent the league, and George W. Dixon, president of the Arthur Dixon Transfer Company, the Chicago Association of Commerce, on a committee on handling l. c. l. matters and trap cars. F. L. Bateman, secretary of the Chicago Furniture Manufacturers' Association, will represent the league on a committee on intensive loading.

The executive committee also discussed the question of the grain movement this year as compared with last, and in this connection it was stated that shipments of wheat and oats were exceedingly light, and it was thought that possibly a large part of the wheat crop would be milled and shipped out as flour. It was also the consensus of opinion that the greater part of the wheat that is exported this year will be shipped from the gulf ports, thus relieving to a large extent the congestion at the terminals on the Atlantic seaboard. A letter was read from J. S. Brown, manager of the transportation department of the Chicago Board of Trade, who advised that the only Chicago roads apparently in need of cars for the grain movement were the Chicago & Alton, the Chicago & Eastern Illinois, the Illinois Central and the Wabash. J. F. Porterfield, general superintendent of transportation of the Illinois Central, stated on September 10 his road was short 665 cars for grain loading at Indiana and Illinois points. He also stated that the I. C. received an average of 130 cars for grain loading per day last year, whereas they were getting only about 30 per day from eastern roads this year, and that help would have to be given by the Commission on Car Service if the movement of grain was to be taken care of on his line. The matter was referred to the Commission on Car Service at Washington, with the request that it consider the advisability of ordering cars to Illinois and Indiana territory.

In response to an inquiry by the Commission on Car Service at Washington as to the attitude of the Chicago roads towards the acceptance or rejection of bad order cars on the commission's orders, it was the consensus of opinion that the following resolution passed by the General Superintendents' Association of Chicago was to the point: "Resolved, that all cars offered on equalization orders of the Commission on Car Service shall be cars which, when delivered, are at least suitable for rough freight of some character. The receiving line should accept and make repairs to all cars requiring running repairs."

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The Interstate Commerce Commission has suspended from September 20 until January 18 the proposed increase in rates on petroleum and its products between points in Central Freight Association territory.

The Interstate Commerce Commission has approved for filing tariffs filed by the Toledo & Ohio Central and the New York Central increasing from 5 to 6 cents per net ton the charge for transferring lake cargo coal to vessel at lake ports.

The commission has suspended from September 20 until January 18 proposed increased commodity rates on cigars, cigarettes and tobacco from Durham, Raleigh and other points in North Carolina and certain Virginia points to points in Central Freight Association territory.

The commission has suspended from September 20 until January 18 tariffs providing for increased rates on wooden pails and tubs in straight or mixed carloads between points on the lines of the Great Northern, Minneapolis, St. Paul & Sault Ste. Marie and the Northern Pacific.

The Interstate Commerce Commission has suspended from September 20 until January 18 proposed increased carload commodity rates on cypress lumber from certain stations on the Chicago, Rock Island & Pacific in Arkansas to Kansas City, Omaha and other western destinations.

Briefs have been filed with the Interstate Commerce Commission in the case involving the tentative valuation of the Texas Midland, reported by the Division of Valuation, which was protested by the road. Briefs were filed in behalf of the railroad company, pointing out the objections to the tentative valuation; by P. J. Farrell, solicitor for the Division of Valuation, asking that the tentative report be made final; by the valuation committee of the National Association of Railway Commissioners, approving the tentative valuation with some modifications, but urging an estimate as to the original cost to date, and on behalf of the four brotherhoods of train service employees, contending that the tentative report should be referred back to the Division of Valuation for a finding as to the original cost to date, without which, it was argued, the report would be valueless. Solicitor Farrell in his brief contended that the commission is not required by the law to fix a definite value.

STATE COMMISSIONS

The Denver, Laramie & Northern

The Public Utilities Commission of Colorado, in a decision issued September 1, approves the action of the Denver, Laramie & Northern in abandoning a part of its road; but concerning the central portion, about 29 miles, the proposed abandonment and dismantling is disapproved. It is understood that this part is to be sold to the Great Western Railway, which operates a line from Longmont to Eaton.

The Denver, Laramie & Northern, formerly the Denver, Laramie & Northwestern, operates from Denver, northward, 56 miles, to Greeley, the stations referred to, in order, being: Utah Junction, 3 miles; Boulder Valley Junction, 19 miles; Milliken, 43 miles; Elm, 48 miles; Greeley, 56 miles. From Denver to Utah Junction, the trains are run over the line of the Denver & Salt Lake; and entrance into Greeley is over the tracks of the Greeley Terminal Railway. The commission holds that there is no demand for the service of this road, warranting maintenance of train service, between Elm and Greeley and between Utah Junction and Boulder Valley Junction. From Boulder Valley Junction to Elm the line is to be taken over by the Great Western.

The decision quotes at length the opinions of numerous courts and state railroad commissions concerning the powers of state commissions in cases of this kind, and also concerning the right of a railroad to give up or transfer its franchise authorizing it to

exist as a corporation. The whole of this line, both that part which is sold to the Great Western and the parts which are to be abandoned, is paralleled by the Denver-Cheyenne line of the Union Pacific, and parts of the line are also paralleled by other roads.

Colorado Car Repairers—Sheds Refused

The Public Utilities Commission of Colorado, George T. Bradley, M. H. Aylesworth and A. P. Anderson, reporting on a complaint of the Brotherhood of Railway Carmen against all of the railroads of Colorado, dismisses the request of the carmen that the commission order the railroads to erect sheds for the protection of car repairers from the weather. Quoting President Wilson (in his proclamation of April 16), and the circular of the Railroads' War Board, calling on railroad men and all other citizens to put forth their utmost efforts to win the war, and to avoid unnecessary work and expenditures, the commission holds that it would be unreasonable to issue the order for the erection of the sheds at the present time. It is recognized that there may be a few days in the winter when sheds would promote the convenience of the men, but the urgency is held to be not so great as claimed.

COURT NEWS

Stop, Look, Listen Rule—Idaho

The Idaho Supreme Court holds that it is the duty of one about to cross a railroad track at a crossing to look and listen, but that it is not negligence per se to fail to stop; and that where the facts are disputed, the question of contributory negligence is one of fact, to be determined by the jury, under proper instructions.—*Graves v. Northern Pacific (Idaho)*, 166 Pac. 571. Decided June 29, 1917.

Constant Operation of Crane at Terminal Not a Nuisance

A crane used by a railroad company for loading and unloading freight was situated in a district in Detroit, the character of which was not preponderantly residential. In a suit against the company the Michigan Supreme Court holds that the operation of the crane by day and night, where made necessary by the demands of the public, was not a "public nuisance." The locality was clearly a railroad terminal, and its character as such must have been known to the people now living there when they took up their abode there. It was held that the trial judge should have directed a verdict for the railroad company and judgment of conviction was reversed.—*People v. Wabash (Mich.)*, 163 N. W., 396. Decided July 26, 1917.

Termination of Initial Carriers' Liability—Custom

Bills of lading of a shipment of cattle provided for through transportation from points in Alabama to New Orleans, La. They contained no stipulations as to point or mode of delivery after arrival at New Orleans. The initial carrier, the Atlantic Coast Line, delivered the cattle to the L. & N. at Montgomery, Ala., by which road they were carried to the terminus at New Orleans. The consignee received two cars of cattle at the L. & N. pens, while all the others were delivered over the Louisiana Southern to an adjacent parish, where the consignee had its yards and place of business. By custom or course of dealings between the consignee and the L. & N., the consignee had the option of receiving shipments at the L. & N. stockyards or through an intermediate carrier. In an action for damages by the shipper against the A. C. L., the Alabama Supreme Court holds that the defendant's liability ended when the shipment arrived at the terminal of the L. & N. for delivery, and as the shipper failed to prove that the condition of the cattle was produced by the defendant or the L. & N., the trial court properly directed a verdict for the defendant. The liability of the defendant could not be extended to cover any loss or damage to the cattle while being transported over the line of the Louisiana Southern by any custom or course of dealings between the consignee and the L. & N., especially where the defendant, when he accepted the shipment, knew nothing of such custom or course of dealing.—*Henderson v. A. C. L. (Ala.)*, 76 So., 309. Decided July 2, 1917.

Foreign Shipments—Limitation of Liability

The New York Appellate Division holds that a shipment from Yokohama to New York, in respect to its transportation by rail from San Francisco, the shipper having given no notice that he elected to ship subject to the common law rules of liability, must be deemed to have been made under the filed classifications and rates, and under the terms of the uniform bill of lading, though no such bill was in fact issued or signed. Under the third section of the uniform bill of lading on file with the Interstate Commerce Commission, where a lower than invoice value of the goods was agreed upon by the bill of lading issued by a steamship company covering a shipment from Yokohama to New York, a carrier by rail, for loss of the goods, was liable only for the agreed value, the agreement having been made for the benefit of each successive carrier.—*Burke v. Union Pac.*, 166 N. Y. Supp., 100. Decided July 13, 1917.

Relief Department Contract—Release in Full

A South Carolina statute provides that the acceptance of benefits under a relief department contract shall not bar an action for negligent injury, notwithstanding a subsequent release given on payment of such sum only as may be due the employee under contract. An employee was injured while employed by the Atlantic Coast Line and while he was a member of its relief department. A dispute existed as to the amount due him on the relief contract, and he refused to accept an amount tendered, and brought suit for damages for his injury. A compromise was effected whereby he was paid \$3,500, which he accepted, executing a release, "in full payment by way of settlement and compromise of all claims and damages growing out of or incident to the injury received by me." He subsequently sued on the relief department contract and the railroad pleaded the release as a bar. The South Carolina Supreme Court holds that the release was a bar to a suit on the relief contract and affirmed judgment for the defendant.—*Starr v. A. C. L.* (S. Car.), 93 S. E., 176. Decided July 25, 1917.

Signal Structure Not an "Attractive Nuisance"

A railroad had recently set up a metal signal structure, including a railed platform at the height of 20 feet, reached by a permanent ladder with rungs that began one foot from the ground and were one foot apart. Near the structure was a wooden pole that for some time had been used by another railroad. Cross-arms on that pole supported dangerous high voltage electric wires. The wires were 3 feet or more above the rail of the platform. A boy between 11 and 12 years old climbed up the ladder to the platform, and while waving his arms in gesticulation came in contact with one of the wires and was severely injured. He sued the railroad. There was proof that sometimes children had played near the structure, which was on the defendant's right of way in Connecticut, and that they had on occasions climbed the structure. There was no proof that the defendant affirmatively had countenanced or permitted, or knowingly had suffered such play or such ascents. The plaintiff claimed that by the law of Connecticut the railroad was liable for negligence. The New York Court of Appeals held that the proof did not justify a verdict for the plaintiff. The plaintiff assumed all risk of danger incident to the then condition of the premises. The so-called "attractive nuisance" doctrine has never been sanctioned by the Connecticut Supreme Court, and the leading New York case on the subject, *Walsh v. Fitchburg*, 145 N. Y. 301, is to the same effect. In both Connecticut and New York the rule is that the duty of a railroad company toward a boy who has become a licensee is not greater than its duty would be to him as a trespasser. No distinction is made between mere trespassers and bare licensees. The railroad was entitled to an instruction that the jury could not predicate a verdict on the proposition that the signal structure was an attractive nuisance; and it was error to qualify such instruction with the statement that the jury might "consider the way this was built in deciding whether the defendant should reasonably have anticipated the boy's climbing the pole." The burden was on the plaintiff to establish active negligence by the defendant. Judgment for the plaintiff was reversed and a new trial granted.—*St. Cartier v. New York, N. H. & H.*, 165 N. Y. Supp., 852.

Equipment and Supplies

FREIGHT CARS

THE WESTERN MARYLAND is asking prices on 1,000 freight cars.

THE GREAT LAKES TRAINING STATION, Great Lakes, Ill., is inquiring for 8 gondola cars.

THE MICHIGAN ALKALI COMPANY, Detroit, Mich., is inquiring for 50 50-ton to 70-ton hopper cars.

THE CUBA NORTHERN has ordered 25 30-ton steel underframe flat cars from the American Car & Foundry Company.

THE OHIO CITIES GAS COMPANY, Columbus, Ohio, is inquiring for 50 to 100 8,000-gal. tank cars.

THE UNITED STATES NAVY has ordered 3 flat cars from the Central Locomotive & Car Works for the Portsmouth, N. H., navy yard.

PASSENGER CARS

THE GUANTANAMO & WESTERN (Cuba) is inquiring through Carr Brothers, of New York, for 3 first-class coaches, 6 third-class coaches, and 3 combination baggage and mail cars.

THE CUBA NORTHERN has ordered 6 first class coaches, 10 second class coaches and 4 combination baggage mail and express car from the American Car & Foundry Company.

IRON AND STEEL

THE RAY & GILA VALLEY has ordered 156 tons of steel from the American Bridge Company for a bridge near Ray, Ariz.

THE VALUE OF MECHANICAL ENGINEERING.—Nowadays most of the civil engineer's work is done by machinery, and even the architect is rapidly becoming only an adjunct to the constructional engineer. The mechanical engineer is called in at the inception of every big undertaking, whether civil or military; and those not thoroughly grounded in mechanics have to take a back seat.—*Railway Gazette, London.*

THE UGANDA RAILWAY, AFRICA.—The railway and lake steamer facilities in the Protectorates of British East Africa and Uganda are owned and operated by the government through the management of the Uganda Railway. The lines operated are all of meter gage. The Uganda Railway proper from Mombasa to Kisumu, on Lake Victoria Nyanza, has a total mileage of 618. The rolling stock consists of 97 locomotives, 234 passenger cars, and 1,292 small freight cars, mostly steel. In Uganda the Busoga Railway has 61 miles of track, and the Port Bell-Kampala Railway operates 6 miles.

LINKING RAILWAYS IN SOUTH AMERICA.—An interesting development in the scheme for linking up the South American railways has just been completed. For some years past the Antofagasta (Chile) & Bolivia Railway and the Bolivia Railway have been constructing new railway lines in Bolivia under a concession given by the Bolivian government in 1906 to certain American bankers. More than \$30,000,000 have already been expended on this scheme, \$12,500,000 of which has been provided by Bolivia. Lines have been constructed linking up the Antofagasta system with the Bolivian capital, La Paz, with Potosi, a mining center, and Cochobambo, an important agricultural district. In addition, a line has been built to tap extensive mines in the south of Bolivia, and this line, it is intended, will eventually connect Bolivia with Argentina. The railway program was initiated by General Montes, the ex-president of Bolivia, who opened the Cochobambo line last month. Percival Farquhar, who conceived the Brazil Railway scheme, was interested in this project, and acquired a large holding in the Antofagasta Company, a substantial portion of which, however, had to be sold subsequently, owing to the Brazil company's difficulties.

Supply Trade News

Russell Dale, general sales manager of the Rich Tool Company and manager of the Tungsten Valve Company, Chicago, died in that city on September 22.

J. M. Fitzgerald and Otto S. Flath, of the Alger Supply Company, Peoples Gas building, Chicago, have been appointed general sales agents of the National Electric Specialty Company, Toledo, Ohio.

Harry L. Allen, assistant fourth vice-president of the American Steel Foundries, died at Cleveland, August 31, at the age of 35 years. Mr. Allen had been with the company 15 years, coming to it at the time of its organization from the American Steel Castings Company.

The recent contracts placed with F. H. Lovell & Co. by the Navy Department, amounting to approximately \$1,500,000, have necessitated further additions to the company's plant at Arlington, including another two-story, 90 ft. by 100 ft. machine shop, in addition to the original machine shops, and an addition to the brass foundry.

E. N. Sanctuary, president of the Oxy-Acetylene Appliance Company, of New York, formerly engineer and secretary of the Bowers Southern Dredging Company, of Galveston, Tex., and an experienced construction engineer, has been commissioned a captain in the Engineer Officers' Reserve Corps, and has been assigned to the Washington office of S. M. Felton, director general of railways, in charge of the personnel for new railway troops being organized for service abroad.

H. McB. Parker, sales representative of the Hunt-Spiller Manufacturing Corporation, Boston, Mass., who entered the Officers' Training Camp at Plattsburg in May, and was thereafter detailed to special duty in the Submarine Signal Company, has enlisted in the United States Navy, and has been assigned to one of the United States destroyers, which has sailed for France. C. L. Galloway has been appointed sales representative of the Hunt-Spiller Manufacturing Corporation for the Northeastern district. Mr. Galloway for the last 18 years has been in the employ of the New York, New Haven & Hartford, in and about Boston, and serving in various capacities in the mechanical department.

TRADE PUBLICATIONS

THE BENJAMIN ELECTRIC MANUFACTURING COMPANY, Chicago, Ill., has issued a new Benjamin catalogue, No. S-2, which shows much that is new in the way of panel board construction, including an entirely new line of resident and dead front panel boards, which represent a great advance in construction and design. Particular attention has been made to arrange the pages so as to make the specifications and listing perfectly clear.

STORAGE BATTERIES FOR INDUSTRIAL LOCOMOTIVES.—The Edison Storage Battery Company, Orange, N. J., has recently issued bulletin 610 on the use of Edison storage batteries in lumber tractors, industrial locomotives and surface carriers. The first part of this bulletin is devoted to the improvement and economy in the operation of lumber mills and yards that may be obtained by the use of electric tractors, industrial locomotives and surface carriers, equipped with storage batteries, and to illustrations with descriptive captions of existing installations where such labor, power and time saving devices are in use in the lumber industry. The last few pages of the bulletin describe the construction and manufacture of the Edison storage battery. The Edison electric portable lighting outfit is described in another bulletin, No. 819. This consists of five cells, type B 2, completely assembled, fully charged and ready for service together with two properly guarded 12 candle power lamps with reflectors and with 11-ft. extension cords. One of these lamps can be used for 20 hours on one complete charge of the battery. Both of them will work for ten hours. This outfit is handy for lighting man-holes and other dark places where electric lights are not usually available. The complete weight of the outfit is 40 lb.

Railway Construction

CHESAPEAKE & OHIO.—This company proposes to build an enginehouse and shop building at Raleigh, W. Va., but the work has not yet been authorized.

CHICAGO & NORTH WESTERN.—This road is adding about 6,000 ft. of track to its switching yards at Antigo, Wis. Company forces are doing the work.

CHICAGO, BURLINGTON & QUINCY.—This company is asking for bids for the construction of a one-story, brick passenger station, 34 ft. by 132 ft., with concrete foundation, at Scottsbluff, Neb. The old passenger station at this point will be moved to a new site and remodeled to serve as a freighthouse.

DALLAS SOUTHWESTERN TRACTION.—E. D. Turner, president of this company and the Dallas Northwestern, is quoted as saying that construction work will be started at once on the electric line, between Dallas, Tex., and Irving. A contract for the construction work has been let to the Creek Construction Company, Supulpa, Okla. The line is eventually to be extended to Cleburne, a distance of about 60 miles. J. T. Witt, chief engineer, Dallas.

GRAND TRUNK.—A new station is to be built by this company at Orillia, Ont., 34 ft. by 142 ft., with umbrella sheds at each end, 22 ft. by 34 ft. The station will have concrete foundations to the grade line, with stone base to height of sills, 3 ft. 8½ in., and the super-structure above the base will be of brick.

GREEN BAY & EASTERN.—This road will be built from Green Bay, Wis., through Manitowoc to Sheboygan, 80 miles. The work will involve the handling of about 9,000 cu. yd. of material per mile, the construction of four 65-ft. bridges, two 50-ft. spans, two 30-ft. spans, and a number of small pile trestles. The bridge work will involve the use of 1,500,000 ft. b.m. of fir timber, 500,000 lineal ft. of piling, 300 tons of steel and 2,000 cu. yd. of concrete. The maximum grade will be 1.5 per cent, and the maximum curvature 6 deg. Steam motive power will be used for handling freight and gasoline electric cars for passenger and express service. The principal commodities the road will carry are cheese, milk, stock feed, live stock, building materials, implements, grain, farm produce and general merchandise. W. M. Willinger, president, Manitowoc, Wis.; Joseph A. Mesiroff, chief engineer, 407 Merrill building, Milwaukee, Wis. (April 13, page 808).

PHILADELPHIA & READING.—This company is building a 15-stall, one-story engine house at Reading, Pa., on a site located north of the shops on Sixth street. It will be 110 ft. wide and 418 ft. long. The entire structure is to be of reinforced concrete and brick; Henry E. Baton, Philadelphia, Pa., is the contractor.

SOUTHERN PACIFIC.—This road will double-track its line between Stockham, Ariz., and Polvo, six miles, the section being approximately three miles each way from the division terminal at Tucson. The work will be very light outside of track laying and ballasting.

CENTRAL TRAFFIC COMPTROLLER IN INDIA.—The Indian Railway Board has appointed a central traffic comptroller to deal with the question of the relative importance of different classes of traffic, and to control the distribution of rolling stock between the various systems. The officer appointed is Lieut.-Colonel H. A. Camcron, the traffic manager of the North Western Railway of India.

INCREASED RATES IN FAR EAST.—Increases of both through and local tariffs on the Chinese Eastern was given effect on July 28, according to an announcement in the Manchuria Daily News. With the local tariffs a 50 per cent increase was introduced in the passenger rates and a 100 per cent advance in the freight rates, except for cereals. The increase for the through freight for transportation over the Chinese Eastern, the Amur, and the Ussuri Railways is 200 per cent; that for the eastern (Harbin-Pogranichnaya) section 40 per cent; and that for the eastern (Harbin-Manchouli) section 100 per cent.

Railway Financial News

CHICAGO, ROCK ISLAND & PACIFIC.—James A. Patten, a director of the Rock Island company, has issued the following statement: "I have seen Mr. Amster's remarkable circular letter to the stockholders, in which he shows a positive genius for inaccuracy of statement. The attack upon J. N. Wallace is without any just foundation. Mr. Amster did not save the stockholders. He was only one of many who did this work. He did not reorganize the company, but the work was done by a committee of six, of which Mr. Amster was only one. Mr. Amster did offer to the stockholders a plan of reorganization, and in order to carry it out asked the stockholders to take \$25,000,000 of 8 per cent preferred rights or income bonds. His plan failed. Mr. Amster made a handsome profit out of the underwriting of the new preferred stock, and received \$25,000 for his services as a member of the reorganization. But this amount did not satisfy him, and when, in the interests of economy, it was thought best by the executive committee to pay no unnecessary salaries, and that no salary should be paid to the members and chairman of the executive committee or the chairman of the full board, he was the only person voting against this resolution. This whole matter could be adjusted to the satisfaction of Mr. Amster if they would continue him as chairman of the executive committee on a salary, and have him sit in the Chicago office, and dictate to Mr. Gorman how he should run the road, for which Mr. Amster has not had the necessary training and has not the native ability to fill, and I object seriously, as a stockholder of the Rock Island road, to having Mr. Amster manage its affairs. I just wish to ask Mr. Amster one general question: How much money did he make out of the reorganization of the Rock Island road? Lastly, the charge made by Mr. Amster that the old crowd is still in control is so untrue it is hardly worth replying to. It is evidently put out with a purpose of appealing to prejudice in order to obtain proxies so that he can obtain control of the road and manage it to suit himself. I sincerely trust that such a contingency is not possible, and that the stockholders of the road will prevent it."

Mr. Amster, in reply to the charges made against him by Mr. Patten, admits that he received \$25,000 as a member of the Rock Island reorganization committee, but contends that the minority stockholders secured a standing in the reorganization as the result of the work he did. "Of course I received \$25,000 as a member of the reorganization committee, as did the other members of that committee," his statement read. "Mr. Prosser, the chairman, received \$50,000. But for the three years' constant work that I did as chairman of the stockholders' protective committee I did not receive a penny. I have just mailed 1,400 checks, aggregating over \$32,000, returning in full the contributions of 1,400 stockholders, although in doing this I personally am out \$10,000 plus the expenses which I am now incurring in the effort to elect directors representative of the stockholders. The real reason for taking away my salary as chairman of the executive committee was probably because I opposed loading up the company with another coal company, which a brother-in-law of one of the leading Chicago directors and a friend of Mr. Patten wanted the company to buy about a year ago at \$200 an acre. The company could buy equally good coal land for under \$40 an acre."

DENVER & RIO GRANDE.—United States Marshal Thomas F. McCarty has levied on \$3,000,000 Liberty Loan bonds, the property of this company in possession of the Hanover National bank and the American Exchange bank, New York City. The seizure of these bonds was by order of Judge Learned Hand in a suit brought by Murray, Prentiss & Howland, attorneys for the Equitable Trust Company, trustees, judgment creditors against the Denver & Rio Grande. This action grows out of the suit of the Western Pacific against the Denver & Rio Grande to enforce payment of interest on bonds guaranteed by the latter, which was decided in favor of the Western Pacific by Judge Hand, who fixed damages at \$38,270,343. The bonds will be sold at public auction.

Railway Officers

Executive, Financial, Legal and Accounting

C. Manning has been appointed assistant to vice-president of the Grand Trunk, with office at Montreal, Que.

T. S. Ford, auditor of the Pittsburgh, Lisbon & Western, has been appointed also treasurer, with office at Lisbon, Ohio, vice C. P. Smith, resigned.

John G. Rodgers, whose appointment as assistant to president of the Pennsylvania Railroad has already been announced in these columns, was born on November 14, 1862. He was



J. G. Rodgers

educated at Lehigh University, and entered the service of the Pennsylvania Railroad on July 20, 1882. Mr. Rodgers served through the various grades in the engineering department until he reached the position of assistant engineer of construction, from which he was transferred in January, 1888, to the maintenance of way office at Altoona. He held various positions in that department until January, 1900, when he resigned as supervisor of the Philadelphia division to become superintendent of the New York, Philadelphia & Norfolk. In March, 1909, Mr. Rodgers was appointed assistant to the general manager of the Pennsylvania Railroad. On March 3, 1911, he was appointed general superintendent of the Northern division at Buffalo, N. Y., and now becomes assistant to president, as above noted.

George C. Jones, whose appointment as assistant to president of the Grand Trunk, with headquarters at Toronto, Ont., has already been announced in these columns, was born on September 24, 1860, at



G. C. Jones

Clyde, N. Y. He began railway work in 1874, and served until 1880, on roads now forming part of the Erie consecutively as messenger and yard clerk on the Atlantic & Great Western at Kent, Ohio, and as yard clerk and operator at various points on the New York, Pennsylvania & Ohio. In January, 1880, he was appointed operator and despatcher on the Cleveland, Columbus, Cincinnati & Indianapolis, now a part of the Cleveland, Cincinnati, Chicago & St. Louis, and from March, 1882, to August, 1883, was operator of the Western Union Telegraph Company. From August, 1883, to February, 1885, he was despatcher on the New York, Pennsylvania & Ohio, now a part of the Erie, and later served as despatcher on the Burlington, Cedar Rapids & Northern, now a part of the Chicago, Rock Island & Pacific. He was then despatcher and chief despatcher on the Wabash, and from January, 1896, to January, 1905, served first as assistant superin-

tendent and then as superintendent of the Grand Trunk. From January, 1905, to February, 1913, he was general manager of the Central Vermont; he then became vice-president of the same road, and since May, 1912, served also as vice-president of the Southern New England, until his recent appointment as assistant to president of the Grand Trunk, as above noted.

E. Marvin Underwood, whose appointment as general counsel of the Seaboard Air Line, with office at Norfolk, Va., has already been announced in these columns, was born on December 11, 1877, in Douglas county, Ga. After graduating from Vanderbilt University in 1900, he attended law school, receiving his degree of bachelor of laws in 1902. He then spent the following year in studies at the Faculté de Droit of the University of Paris, and upon his return to this country began the practice of law at Atlanta, Ga. He later became a member of the firm of King, Spalding & Underwood, of that city, and as such engaged in railroad practice, representing, among other companies, the Seaboard Air Line Railway. On February 24, 1914, he was appointed assistant attorney-general of the United States and as such represented the government in a number of important litigations before the Supreme Court of the United States, notably the case in which the constitutionality of the Adamson Law was upheld and the Pacific Terminal Case.

George Reeder has been appointed auditor of the Gulf, Florida & Alabama, with office at Pensacola, Fla., vice J. P. Smith.

E. F. Blomeyer, general manager of the Ann Arbor, with headquarters at Toledo, Ohio, has also been appointed vice-president, effective September 1.

Operating

Alexander M. Parker, who has been appointed superintendent of the Camden Terminal division of the Pennsylvania Railroad, and the West Jersey & Seashore Railroad, with headquarters at Camden, N. J., as has already been announced in these columns, was born on June 25, 1870, at Carlisle, Cumberland county, Pa., and was educated at Dickinson College. He entered the service of the Pennsylvania Railroad in 1888 as rodman, in which capacity and subsequent higher ones he was engaged for several years on survey work. In 1891 he was transferred to the assistant engineer's office on the Philadelphia division, and was later transferred to the office of the principal assistant engineer at Altoona. In 1892 he was appointed assistant supervisor of the Philadelphia division at Lancaster, and four years later was transferred as assistant supervisor to the Philadelphia yards. He was appointed supervisor at Tyrone in 1897, and subsequently served in the same capacity on the Frederick, the Schuylkill and the New York divisions, becoming assistant to the principal assistant engineer at Jersey City, N. J., in 1903. He was appointed principal as-

sistant engineer in 1905, and upon the organization of the Hudson division at New York in 1909, Mr. Parker was appointed superintendent. On January 1, 1912, he was transferred as superintendent to the Allegheny division, with headquarters at Oil City, Pa., which position he held until his recent appointment as superintendent of the Camden Terminal division and the West Jersey & Seashore, as above noted.

Paul L. Grove, who has been appointed superintendent of the Delaware division of the Philadelphia, Baltimore & Washington, with office at Wilmington, Del., was born on October 3, 1878, at Altoona, Pa., and was educated in the public schools of that city. From May 1, 1894, to December 1, 1899, he was employed by the Pennsylvania Railroad as messenger and machinist apprentice in the Altoona shops. On February 1, 1902, he was transferred to the shops at Columbia, Pa., as inspector, and in October, 1904, became shop foreman on the Bedford division. He was promoted to assistant master mechanic of the Altoona machine shops on July 1, 1905, and was made assistant engineer of motive power on the Buffalo division in September, 1910. He was promoted on December 1, 1913, to master mechanic on the Williamsport division; in October, 1914, he was transferred to the Renovo division, and on July 1, 1916, he was again transferred to the Philadelphia Terminal division, in charge of the West Philadelphia shops, and now becomes superintendent of the Delaware division of the Philadelphia, Baltimore & Washington, with headquarters at Wilmington, Del.

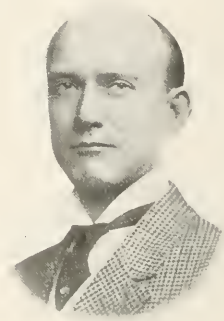
Andrew J. Whitney, who has been appointed general superintendent of the Northern division of the Pennsylvania Railroad, with headquarters at Buffalo, N. Y., as has already been announced in these columns, was born on October 11, 1862, at Harrisburg, Pa., and was educated in the public schools and the Harrisburg Academy. He entered the service of the Pennsylvania Railroad in June, 1881, as a rodman, and was engaged on the construction of the Lewisburg & Tyrone Railroad and the Schuylkill Valley Railroad. In May, 1886, he was transferred to the maintenance of way department, at York, Pa., on the Frederick division, as engineer right of way; he subsequently was assigned to the Altoona office, and on February 1, 1889, was appointed assistant supervisor at Washington, D. C. Mr. Whitney was promoted to supervisor on the Tyrone division at Tyrone, Pa., in May, 1893, following which he served consecutively as supervisor at Pittsburgh yard, assistant engineer of the West Penn division, and acting superintendent of the same division. On June 1, 1903, he was appointed assistant engineer of the West Jersey & Seashore; and in May, 1905, was made principal assistant engineer of the Pennsylvania Railroad division. He was appointed superintendent of the Delaware division of the Philadelphia, Baltimore & Washington at Wilmington, Del., in April, 1907, and



E. M. Underwood



P. L. Grove



A. M. Parker



A. J. Whitney

was made superintendent of the Maryland division in January, 1910, which position he held until his recent appointment as general superintendent of the Northern division of the Pennsylvania Railroad, as above noted.

O. R. Belcher has been appointed superintendent of the Nevada-California-Oregon, with headquarters at Alturas, Cal., vice J. W. Ward, resigned.

E. T. Mulquin has been appointed chief dispatcher of the Second district of the St. Louis Southwestern, with office at Pine Bluff, Ark., vice C. Dancy, resigned.

John L. Wilkes, formerly chief dispatcher of the Illinois Central, at Princeton, Ky., and more recently out of railway service, has been appointed assistant superintendent of the Nashville, Chattanooga & St. Louis, at Atlanta, Ga.

P. C. Byrne, superintendent of the Alabama & North Western, has been appointed general superintendent in full charge of operation and maintenance, with headquarters at Mobile, Ala. The office of superintendent has been abolished.

O. W. Campbell has been appointed assistant to chief operating officer of the Missouri, Kansas & Texas, and the Missouri, Kansas & Texas Railway of Texas, with headquarters at Dallas, Tex., vice C. G. Elliott, resigned to engage in other business. Effective October 1.

R. E. Laidlow has been appointed superintendent of terminals of the Michigan Central at Detroit, Mich., succeeding J. L. McKee, resigned to accept service with another company; and W. A. Keavy has been appointed assistant superintendent of terminals at Detroit, succeeding Mr. Laidlow, effective September 15.

Traffic

S. J. Witt has been appointed general agent of the Akron, Canton & Youngstown, with offices at Akron, Ohio.

George S. Harlan has been appointed division freight agent of the Baltimore & Ohio, with headquarters at Baltimore, Md.

L. F. Root has been appointed commercial agent of the Cincinnati, Indianapolis & Western at Indianapolis, Ind., succeeding P. M. Havens, promoted, effective September 8.

J. A. Cox has been appointed commercial agent of the Galveston, Houston & Henderson, with headquarters at Houston, Tex., succeeding J. M. Lamb, resigned to enter military service.

J. S. Taber, freight agent of the Texas & Pacific, with headquarters at Abilene, Tex., has been appointed commercial agent, with the same headquarters. He will also continue his duties as freight agent.

M. A. Patterson, assistant general freight agent of the Chicago, Rock Island & Pacific at Chicago, has been promoted to general freight agent, with office at Chicago, succeeding H. A. Snyder, resigned, and Carl R. Maier has been appointed assistant general freight agent, with office at Chicago.

James P. Anderson, general agent of the Pennsylvania Railroad at Philadelphia, Pa., has been promoted to passenger traffic manager of the Pennsylvania Lines East of Pittsburgh and Erie, succeeding George W. Boyd, deceased; Oliver T. Boyd, division passenger agent at New York, has been promoted to general passenger agent of the Pennsylvania Railroad Lines East of Pittsburgh, with headquarters at Philadelphia; William Pedrick, Jr., division passenger agent at Baltimore, Md., succeeds Mr. Boyd as division passenger agent at New York; A. E. Buchanan, division passenger agent at Harrisburg, Pa., has been promoted division passenger agent at Baltimore, and N. S. Longaker, district passenger solicitor at Philadelphia, has been promoted to division passenger agent at Harrisburg. Effective October 1.

H. A. Snyder, general freight agent of the Chicago, Rock Island & Pacific, with headquarters at Chicago, has retired. Mr. Snyder was born at Pottsville, Pa., on June 23, 1857, and entered railroad service with the Philadelphia & Reading in 1876, as a clerk in the freight office in that city. He was later transferred to the general freight office at Philadelphia, and in 1888, when the Philadelphia & Reading opened an office at Chicago he was appointed general western agent, with headquarters there. He was appointed general agent of the Chicago, Rock Island &

Pacific, at Omaha, Neb., in 1889, and on January 1, 1897, was promoted to assistant general freight agent, with headquarters at Chicago. He was appointed general freight agent on January 1, 1910. He was in railroad service for 41 years, 28 of which were with the Rock Island.

W. E. Duperow, whose appointment as general passenger agent of the Grand Trunk Pacific and the Canadian Government Railways, with headquarters at Winnipeg, Man., has already been announced in these columns, was born in 1872, at Stratford, Ont., and in 1893 entered the service of the Grand Trunk. He held various positions in the passenger traffic department until 1902, and then for five years was general manager of the Huntsville, Lake of Bays and Lake Simcoe Navigation Company, at Huntsville, Ont. He returned to the service of the Grand Trunk as traveling passenger agent at Toronto, and in 1910 was appointed city passenger and ticket agent at Victoria, B. C. Two years later he became general agent at Vancouver, and in 1914 was appointed assistant general passenger agent of the Grand Trunk Pacific. He subsequently was appointed assistant general passenger agent also of the Canadian Government Railways, and now becomes general passenger agent of both roads, as above noted.

W. E. Duperow

Engineering and Rolling Stock

R. J. Williams has been appointed superintendent of motive power of the Pere Marquette, with headquarters at Detroit, Mich., succeeding W. L. Kellogg, resigned; effective October 1.

The signal and telephone departments of the Western Maryland have been combined, and the title of E. E. Bradley, signal engineer at Baltimore, Md., has been changed to signal and telephone engineer.

H. C. Eich, master mechanic at the Burnside, Chicago, shops of the Illinois Central, has been appointed superintendent of motive power of the Chicago Great Western, with headquarters at Oelwein, Iowa, succeeding G. M. Crownover, resigned.

Herbert E. Morgan, pilot signal engineer in the valuation department of the Illinois Central, has been appointed signal engineer, succeeding W. M. Vandersluis, who is now a captain in the Engineering Corps, and is stationed at Ft. Leavenworth, Kan.

H. C. May, superintendent of motive power of the Lehigh Valley at South Bethlehem, Pa., has been appointed to the same position on the Chicago, Indianapolis & Louisville, with office at La Fayette, Ind., succeeding C. P. Burgman, assigned to other duties.

W. J. Bennett, assistant superintendent of motive power on the Denver & Rio Grande, at Denver, Colo., has been appointed superintendent of the motive power and car departments, with the same headquarters, effective September 20, succeeding J. F. Enright, deceased.

J. B. Diven, assistant engineer of motive power of the New Jersey division of the Pennsylvania Railroad at New York, has been appointed master mechanic of the Philadelphia terminal division, with office at West Philadelphia, Pa., succeeding P. L. Grove, promoted to superintendent of the Delaware division, with office at Wilmington, Del. James Young, Jr., assistant master mechanic of the Philadelphia, Baltimore & Washington, at Wilmington, Del., succeeds Mr. Diven; J. H. Fulmor, master mechanic of the Pennsylvania Railroad at Mount Carbon, Pa., has been appointed inspector in the office of the superintendent of motive power, Eastern Pennsylvania division, with headquar-

ters at Altoona; and C. J. Halliwell, inspector in the office of the general superintendent of motive power at Altoona, succeeds Mr. Fulmor. F. E. Marsh, assistant master mechanic at Altoona, has been appointed master mechanic of the New York, Philadelphia & Norfolk, with office at Cape Charles City, Va., succeeding A. W. Byron, granted leave of absence to enter military service at Camp Oglethorpe, Ga., and C. W. Burket has been appointed assistant master mechanic of the Monongahela division of the Pennsylvania, with office at South Pittsburgh, Pa., succeeding E. H. Newbury, transferred to shop inspector in the office of the superintendent of motive power at Pittsburgh.

W. H. Sample, whose appointment as superintendent of motive power of the Grand Trunk, with headquarters at Montreal, Quebec, has already been announced in these columns, was born in 1864, at Altona, N. Y., and was educated at the high school of his native town. He began railway work in 1882, as fireman on the Central Vermont, and in 1886 was promoted to engine-man. From 1887 to 1890, he served on the Santa Fe System as engine-man, and then returned to the Central Vermont. In 1901 he was appointed road foreman of engines, remaining in that position until 1906. He then entered the service of the United Fruit Company as superintendent of motive power and car departments, on the Northern Central Railway of Costa Rica, Central America, resigning from that position in 1911 to go to the Grand Trunk as master mechanic on the Ottawa division. He was transferred as master mechanic in 1914 to the western lines, and in 1916 was again transferred in the same capacity to the eastern lines.



W. H. Sample

Purchasing

G. H. Walters, engineer of tests in the stores department of the Chicago, Milwaukee & St. Paul, at Milwaukee, Wis., has been appointed assistant purchasing agent, with office at Chicago, succeeding A. J. Jennings, resigned.

F. B. MacSwain, storeman on the Canadian Pacific at Ogden, Alta., has been appointed storekeeper, with headquarters at Calgary, succeeding G. F. Rosengren, transferred to Lethbridge. N. C. Stibbs, storekeeper at Lethbridge, has been transferred to Nelson, B. C., succeeding D. S. Schofield, transferred to Revelstoke. T. W. Madden, storekeeper at Revelstoke, has been transferred to Coquitlam.

Special

W. H. Howard, secretary of the Southeastern Passenger Association for several years, with office at Atlanta, Ga., has been elected chairman of the association, succeeding the late Joseph Richardson.

Railway Officers in Military Service

H. W. Young, assistant engineer on the Union Pacific, has been appointed captain in the Eighth Regiment, Engineering Corps, United States Army.

E. R. Reynolds, until recently general baggage agent of the Chicago Great Western at Chicago, is now a captain in the National Army at Camp Grant, Ill.

Byron L. Kelso, until recently assistant engineer in the valuation department of the Chicago, Burlington & Quincy, at Chicago, has received a commission as captain in the Engineer Officers' Reserve Corps.

W. A. Hill, assistant engineer in the valuation department of the Chicago, Burlington & Quincy, at Chicago, has been commissioned major in the Engineer Officers' Reserve Corps, but

has not yet been called to service. T. R. Brunson, also an assistant engineer in the valuation department of the Burlington at Chicago, is now at Fort Sheridan, Ill., in the second officers' training camp.

Paul T. Marwick, secretary to President S. M. Felton, of the Chicago Great Western, has been transferred from Chicago to Washington as secretary to Mr. Felton as director general of railways, Corps of Engineers, War Department.

OBITUARY

George W. Boyd, passenger traffic manager of the Pennsylvania Railroad, Lines East of Pittsburgh, with office at Philadelphia, Pa., died on September 22 at his summer home at Cape May, N. J. He was born on August 1, 1848, at Indianapolis, Ind., and began railway work in 1863, in the freight department at Indianapolis of the Cleveland, Columbus, Cincinnati & Indianapolis, now the Cleveland, Cincinnati, Chicago & St. Louis, and for several years he served as clerk of the freight department. In June, 1872, he was appointed cashier of the passenger department of the Pennsylvania Railroad, remaining in that position until January, 1874, when he was promoted to chief clerk. From January, 1882, to June, 1903, he was assistant general passenger agent of the same road, and then was promoted to general passenger agent, which position he held until March 1, 1913, when he was appointed passenger traffic manager.



G. W. Boyd

Edward Stanton Koller, vice-president and general manager of the Colorado & Southern, whose death was announced in the *Railway Age Gazette* of September 7, was born at New Freedom, Pa., on October 18, 1864. He entered railway service with the Pennsylvania in 1882 as a telegraph operator, and clerk in the office of the division superintendent at Harrisburg, and four years later entered the employ of the Chicago, Burlington & Quincy in a similar capacity. In March, 1892, he was promoted to traveling auditor, and in March, 1903, he became chief clerk in the division superintendent's office at Lincoln, Neb.

On April 1, 1905, he was appointed trainmaster of the Lincoln division, and later served successively until September 1, 1912, as assistant superintendent of the same division, superintendent of the McCook division, and general superintendent of the Illinois district, with headquarters at Galesburg, Ill. On the latter date he was promoted to assistant general manager of the lines east of the Missouri river, and on August 1, 1913, was transferred to the lines west of the Missouri river, with headquarters at Omaha, Neb. On March 1, 1915, he was appointed general manager of the Colorado & Southern at Denver, Colo., and on March 1, 1916, was elected vice-president in addition, in which capacity he served until his death.



E. S. Koller

Railway Age Gazette

Volume 63

October 5, 1917

No. 14

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GENERAL NEWS SECTION.....

The importance of the work of the railway development departments has been increased greatly in the short time

Commercial Possibilities of the South

that has elapsed since the United States entered the war last April. Most people are aware of the prominence taken by this department in the movement to increase the supply of foodstuffs by arranging for leases of company land for employees' war gardens, the assistance given in various ways to farmers, the material published on the proper culture, harvesting, and storing or preserving of vegetables, etc. We have not heard so much, however, about the search that the railways have been making for new minerals and substitutes for materials that were formerly imported into this country, or of the assistance that has been given to industries working with such materials. The work that has been done along this line was very forcefully brought out at the Third National Exposition of Chemical Industries held in New York last week. Five railways, the Southern, the Norfolk & Western, the Nashville, Chattanooga & St. Louis, the Carolina, Clinchfield & Ohio, and the Central of Georgia, had exhibits, and it was an eye opener to see the variety of materials that are available in the territory these roads traverse; coal, lumber, tanning materials, kaolins and clays, shales, bauxites, limestone, marble, manganese, copper, arsenic, asbestos, silica, graphite, mica, sulphur, etc. In fact, of 57 commercial minerals found in this country no less than 53 are found in the South. The industrial or development departments of the five roads above mentioned are doing much to develop the commercial possibilities of these materials.

Notwithstanding the fact that R. A. White, general auditor of the New York Central and former president of the Association of American Railway Accounting Officers, strongly urged in a letter to the association the appointment of a committee to study methods which are being developed by different accounting organizations and to act as a clearing house for what might be called "kinks" in auditing methods, the association, by a comparatively close vote, turned down the suggestion.

A Needed Committee

Probably if Mr. White had been present at the convention of the association and could have given more fully than he did in his letter the reasons which led to the introduction of the resolution, it would have been carried. The point urged against it was that the executive committee was now empowered to deal with such matters. Mr. White's experience, however, as president was that there were many questions which came up which did not come under the jurisdiction of the executive committee but which ought to be dealt with by some committee of the association. As it is now, there are really a great number of details which are dealt with in various ways in different auditing offices. Some methods of handling these details are far better than others, but unless chance intervenes, members of the association, except close friends of the officers with the improved methods, will never hear about them. There is so much routine to audit office work that accounting officers are peculiarly liable to get into a rut. It is especially necessary that there should be free interchange of ideas, therefore, and it would seem that the association might well have given more serious consideration to the experience and resulting suggestion of one of the most progressive presidents the association has ever had.

Without in any way reflecting on the ability or character of the three men whom President Wilson has nominated for appointment to the Interstate Commerce Commission, it is to be regretted that advantage was not taken of the opportunity presented by the necessity of making three appointments at once to place on this important body at least one man of practical business experience in the affairs over which the commission has jurisdiction. One of the new appointees is a newspaper man who has demonstrated ability in several ways; two are lawyers and former members of state railway commissions, one of them with a considerable experience in that field and one whose term of office was very brief. Undoubtedly they are all very good men and compare very favorably with the majority of the candidates whose appointment is urged upon the President by congressmen and others when vacancies

The New I. C. C.

Appointments

occur in governmental offices of this kind. However, as was stated in an editorial last week, we had hoped that when the commission was to be enlarged to nine members, in recognition of the importance and magnitude of its work, a serious effort would be made to secure men of special knowledge, experience and ability in the field with which the commission has to deal, following the precedent already set in appointments to the Federal Reserve Board, the Federal Trade Commission and the Tariff Commission. The *Railway Age Gazette* has frequently urged the appointment of a practical railroad man to the commission. We appreciate that there are some practical and political difficulties involved in such of course, but the circumstance of three vacancies at one time when the commission was to be enlarged presented an unusual opportunity for the selection of a representative of the shippers and another of the railroads without leaving the slightest room for criticism that either side was being favored or that the commission was being packed with experts. Surely it would not have been impossible to find two men of long experience in facing the problems of the business man who uses the railroad and of the railroad manager who could bring to the commission the practical business viewpoint without an undue amount of partisan prejudice. As the commission will now be constituted it will contain a majority of lawyers, also a majority of five men who have served as state railroad commissioners. It may be argued that as the business of the commission is to interpret and administer the law, it should include a large proportion of men of legal training, and that because its function is to regulate railroads, men who have had experience in such regulation are especially fitted for its work. We could more readily concede the force of such a contention if it were not carried to an extreme.

The nine regiments of railway engineers now in France or on their way there

Living Up to the Regiments Overseas

furnish only one of the many reasons why railwaymen should subscribe for the second issue of the Liberty Loan; but they furnish the one big reason why railwaymen should excel their brothers in all other lines of industry in subscribing. No other industry has so representative a body of men in France as have the railways, and it is only right that railway men at home should take it upon themselves to show that there was reason and justice in giving railwaymen the honor of being among the first to get into action in France. The railwaymen overseas are already setting a pace that their brothers at home will be hard pushed to follow. But surely American railwaymen still at their daily tasks are not going to let the men in uniform overseas get all the glory! The men in the railway regiments are doing their duty, whatever it may be, with an enthusiasm and a will. The men at home are doing their duty likewise; but just as it is the duty of an engineer company to construct a mile of railway directly behind a battery, so is it the duty of railwaymen at home to do their daily tasks efficiently, and, when the opportunity offers, to subscribe for Liberty Loan Bonds. Railwaymen abroad are leading men of other industries in making history. Railwaymen at home are likewise leading men of other industries in the performance of their duty. Let the good work go on; apply the same principles to the Liberty Loan! The government wants subscribers. If a railwayman took no bonds in the first loan, now is his chance to make up for it; if he took some the first time, let him take more; if he is still tied up with bonds on the partial payment plan and is financially unable to take more, then his way is clear; let him get after the man next to him to get on the "Bond Wagon." There are easy payment plans galore, and to be patriotic at four per cent certainly is not hard.

The Association of American Railway Accounting Officers, at its convention held in Chicago last week, voted to take steps to call to the attention of railroad executives and of the Railroads' War Board in Washington the need for through interline waybilling. The discussion of this subject is as old as the association itself and it was the necessity for a common understanding of this and related subjects that led to the formation of the association in 1888. At present, however, it takes on an importance even greater than it has ever had before. Universal interline waybilling would presumably carry with it the establishment of through rates on a very much broader scale than at present and should do away also with the present absurdly complicated inter-road divisions. These divisions have been built up by an intricate game of give and take between traffic officers of different roads and between traffic officers and shippers, with the result that to work out one road's division of a rate is often a mathematical problem of very considerable labor. There are probably a great many reasons, at least in the minds of traffic officers, why it would be very difficult to make a change and why a change would be inexpedient. The fallacy of these arguments is best demonstrated by the fact that the same traffic officer who will argue that the rates applying to his own road should not be simplified will sweep aside as mere timidity the argument that some other complicated set of rates in which his road is not interested could not be simplified. Local waybilling between junction points, with rates based on a percentage of other rates, which themselves are based on some complicated system of percentages, makes a large amount of absolutely unnecessary clerical labor. The difficulty of getting together widely separated traffic officers and of getting any agreement between a multitude of competitors has heretofore been greater than the Accounting Association could overcome. Now, however, when there is a central board with power to deal with such subjects, and when the interest of all classes of railroad officers has been so concentrated on the elimination of waste, the time ought to be propitious for an establishment of interline waybilling with through rates and simplified divisions.

"SMOKES" FOR THE RAILWAY MEN IN FRANCE

THE railway-regiments which have been raised and those which are being raised for service in Europe should be "adopted" by the railway officers and employees and the railway supply concerns of this country. These regiments are composed of former railway officers and employees. Their members are all making great sacrifices for their country. Whatever the railway and railway supply men who stay behind can do to show their appreciation of what the members of the railway regiments are doing, to help to make them realize that the folks at home have not forgotten them and to contribute to their comfort and even their pleasure ought to be done.

When men are deprived in one way or another of the social life and the comforts of home the proportion of them who smoke greatly increases, and in no class of men is the desire for the enjoyment of smoking greater than among soldiers.

"For thy sake, tobacco, I
Would do anything but die"

said Charles Lamb in his "A Farewell to Tobacco." The average soldier, and especially if he has been deprived of a reasonable supply of tobacco for a while, would state his feelings quite as strongly as did Lamb. Furthermore, the average American soldier who has had to use French tobacco for a while would be willing almost to die for some American tobacco. The manufacture and sale of tobacco is a

monopoly of the French government and Americans who have had experience with the French tobacco seldom care to renew acquaintance with it.

In order that the members of the railway regiments may have the solace of "Lady Nicotine" a movement has been started by a number of the leading railway supply concerns to raise a fund among the railway supply companies for this purpose. Details regarding this movement are given elsewhere in this issue. S. M. Felton, director general of the railways of the United States government, has estimated the amount of tobacco which should be sent to the railway regiments and the committee of railway supply men which has been organized will endeavor to raise a fund sufficient for this purpose.

No difficulty ought to be experienced in raising the required amount of money. Contributions ought to flow in in abundant quantity from railway supply companies, and supply men all over the country who are interested in the comfort and welfare of the brave and patriotic men composing the railway regiments. All the members of these regiments are volunteers and they have been inspired solely by patriotism in enlisting. The railway supply men who are among the most patriotic and generous of our citizens, may be relied on for their bit in seeing that they do not want for smokes.

"BREAD CAST UPON THE RAILS"

SOME facts which are of great interest and significance at this time are presented in an entertaining story form by John W. Kean, transportation clerk of the Navy Department, in an article entitled, "Railway Land Grants Now Save Public Millions," which we publish elsewhere in this issue. For many years it has been the custom of men of the LaFollette school of political philosophy to dwell upon the "gifts" of vast amounts of land made by the government to the early railways to secure their construction. Mr. Kean's article shows that these grants of land were not "gifts," but had a string tied to them and that this string will, during the present year, save the government approximately \$50,000,000 in military transportation charges.

The railways are required to transport the government's property and troops over their land grant lines either free or for 50 per cent of the rates charged to the public. The land, when given to the railways, was practically valueless, as Mr. Kean shows. Before the Illinois Central Railroad was constructed, land in the territory where it was built was offered for sale by the government at 12½ cents an acre. Mr. Kean estimates the present value of all the land given to the railways at an average of \$10 an acre, or approximately \$1,000,000,000. If this estimate is correct, it comes to a very large sum. But if Mr. Kean's estimate of \$50,000,000 as the government's saving on military transportation as a result of the land grants also is correct, then the government this year on military transportation alone will make a saving as the result of the land grants which will pay a return of 5 per cent on the present value of all the land that it has given to the railways. Furthermore, the roads which, because of the land grants, have to perform military transportation free or at reduced rates, also have to transport the mails at reduced rates, and always have had to.

It is a well known fact that the construction of railways immediately caused very great increases in the value of the adjacent land which the government kept as well as in the value of that which it gave to the railways. As Mr. Kean shows, land along the Illinois Central which the government had been offering for 12½ cents an acre readily sold after the road was built for \$2.50 an acre. The increase in the value of the land retained by the government was sufficient to far more than compensate for all the grants it had made to the railways. It would be interesting, however, if a record

could be presented showing annually how many millions of dollars the government has saved in the transportation of troops, of the mails and of property belonging to it as a result of the reduction of rates secured by the land grant agreements. We have heard the statement made, although we have never seen detailed statistics advanced to support it, that certain railways, by the reductions in rates on government business alone, have repaid the government several times over for the land which it is alleged to have "donated" to them. All of which shows, as Mr. Kean makes Uncle Sam remark, that bread cast upon the rails, like bread cast upon the waters, may return after many days.

SOME VIEWS ON RAILROAD PROFITS AND RAILROAD MELONS

IN its issue for September 20 the Omaha Daily News published an editorial in which, on the basis of certain statistics compiled by the Interstate Commerce Commission, it estimated that "the net revenue or profit of the railways of the United States in June, 1917, will be found to exceed that for June, 1916, by \$10,000,000." The total figures for June of railways operating about 90 per cent of the mileage of the country and receiving about 97 per cent of the total earnings are now available. They show that for June, 1917, as compared with June, 1916, total operating revenues increased \$49,720,000 and operating expenses and taxes \$42,276,000, leaving an increase of net operating income of \$7,500,000.

But why pick out a single month for comparison when the figures for six full months of the present fiscal year are available? The figures for the six months, January to June, inclusive, show that total operating revenues of the same roads increased \$201,000,000, while operating expenses and taxes increased \$219,500,000, and in consequence net operating income or "profit" was over \$18,000,000 less than in the first six months of 1916.

Furthermore, every person having any knowledge of railway affairs who will study all the underlying figures, will see that the net earnings now being shown are largely artificial because the railways are not spending as much for maintenance of equipment and maintenance of way as they ought in order adequately to maintain the properties. In the first six months of 1917 the increase in total operating revenues was 12.2 per cent and the increase in operating expenses 18.5 per cent. Meantime, the increase in transportation expenses was 26.3 per cent; the increase in expenditures for maintenance of equipment, 12.5 per cent; and the increase in expenditures for maintenance of way only 7.6 per cent. If the railways were spending relatively as much for maintenance as they were four years ago, and as they ought to keep in good shape, their operating expenses would be much larger and the net operating income shown much smaller.

Why are they not spending more for maintenance? Partly because some of them cannot afford to; partly because of high wages and high prices; partly because of scarcity of labor and materials. It is certainly unfortunate for the roads that they should be exploited in the press as enjoying larger net earnings than they really are, when these large nominal net earnings are being derived in great measure from the deterioration of numerous properties.

Continuing in its editorial, the Omaha Daily News refers to the extra 10 per cent dividend declared by the directors of the Burlington on August 3, and quotes some statements from the Daily News Record, which it refers to as "a New York financial and commercial sheet."

"This is only a very small slice," says the Daily News Record in the article quoted, "of the Chicago, Burlington & Quincy melon, which will some day come to the holders of stock. As a matter of fact, extra surplus is estimated in

excess of \$100,000,000, and this 10 per cent extra dividend is only 10 per cent of that estimated surplus."

The implication is that stockholders will ultimately get all of the Burlington surplus. They would have some difficulty in getting it very soon in the form of cash dividends, since practically all of it is invested in physical improvements in the property. "If the improvements, which have been paid for out of earnings, were capitalized," the Daily News Record adds, "the surplus would be very much larger." We suppose this sentence is meant to suggest that the way the Daily News Record expects the stockholders to get the rest of the melon is in the form of stock dividends.

"The same journal, talking frankly, because," as the Omaha Daily News remarks, "it is read only by those who profit from the conditions it describes," continues:

"The significance of it (the Burlington dividend) was that perhaps prosperous railroads would do something more for stockholders than pay dividends of the past few years, now that it was no longer necessary to join the hue and cry of railroad poverty and impending bankruptcy. There is a long list of railroad properties in this country which can declare larger dividends, extra dividends, rights, etc., dividing up accrued surplus, provided that directors are willing to do so. Railroad etiquette demanded that in the campaign for increased rates there should be no such distribution, but now that the ice is broken, other directors may be willing to take the plunge."

As the Omaha Daily News truly remarks, "Quite different from the talk made by the railways when they asked for permission to raise rates!" But the Omaha Daily News should note that all this talk about railroads that are so rich they can afford to increase dividends, cut "melons," etc., does not come from the managers of the railways. It comes from a publication in New York for whose views most of the railway managers would be only too glad to disavow responsibility.

The quotations we have made from the Omaha Daily News and from the Daily News Record of New York illustrate two kinds of utterances which do the railways much harm. There is one class of publications which constantly exaggerates the prosperity of the railways in order to create public sentiment against them. There is another class which constantly exaggerates the probable, and even the possible, dividends of railways, apparently to subserve the purposes of the speculative element among investors and of that other large class of investors who have never become reconciled to the principle that great conservatism in financial management is as indispensable to the future welfare of the railway companies as efficiency in operation.

The managers of the railways know, first, that there are not many roads in this country that could now, or are likely ever to be able in future to cut melons. They also know that it is most inexpedient for the railways as a whole that those which can do so should do so. Unfortunately, the hands of the responsible managers are often forced by men in Wall street whose avarice is only surpassed by their ignorance of the state of public opinion west of the Allegheny mountains.

To any men having influence in the financial affairs of railways who believe with the Daily News Record of New York that there are numerous prosperous railways which could and should go into the melon-cutting business, the *Railway Age Gazette* suggests that they travel for a while over the lines of the railways of the South and West and familiarize themselves with the sentiment which prevails among the people of those territories, especially those in the agricultural communities. If they will do this, they will return to their desks realizing that so far as the future of private ownership and management of railways in the United States is concerned, they had just as well go out and dynamite every mile of road in the country as to attempt to revive the melon-cutting industry.

The *Railway Age Gazette* does not believe in railroad melons, whether in the form of stock dividends or cash dividends or in any other form. We do not believe in them either as a matter of railroad policy or of principle. The

melons which a few railways cut 10 years or more ago, have, by the effect they produced on public sentiment, cost the railways as a whole hundreds of millions of dollars, and, if as a result of such emanations from Wall street as that published by the Daily News Record of New York, the impression goes abroad that melon-cutting is to be revived in the railroad business, those who are now trying to secure reforms in our present system of railway regulation had just as well shut up shop and engage in some other line of endeavor.

There is no good reason founded on public policy, economics, law or morals why a railway which has been conservatively financed, is being efficiently operated and well maintained, is giving the public good service and is earning enough money to do so should not pay dividends of 6, 8 or 10 per cent; but proposals to pay big extra dividends or to capitalize invested surplus by the issuance of large stock dividends are dangerous in the extreme, and if any of the financial powers in Wall street don't know this they need education regarding railway affairs even more than do the radical politicians of the Middle West.

MATERIAL FOR THE MECHANICAL DEPARTMENT

THE mechanical departments on most railroads have for a number of years been giving more and more attention to the conservation of material. This tendency was quickened during the hard times, preceding the world war; as a result a great many roads had a more or less thorough housecleaning of material. Some of it was found to be obsolete or entirely useless and was sold as scrap; other parts were such that they could be repaired or reworked and put back into service; a large amount of material was suitable for immediate use and was turned back into the storehouses for distribution to points where it was most needed. After the entry of this country into the war the price of materials rose to a still higher level and further incentive was given to clamoration. Certain classes of material became exceedingly difficult to get at any price and the railroads were forced to use all their ingenuity in piecing out, reworking and utilizing scrap material of this sort.

In not a few cases radical changes have been made in the design of parts in order to substitute materials which were more easily obtainable. There are limits, however, to which the conservation of material may be carried in these days when the cars and locomotives are making new records each month for service performances, and this is particularly true now that skilled labor, or labor of any kind, is so scarce. A new factor has also entered into the problem in the past few months; the output of a number of industries that supplied raw material to railway supply companies, and even some of those that furnished finished material to railways, has been commandeered by the government. More and more is expected of the railroads in the months to come, and yet it must frankly be admitted that the heavy and prolonged stress on the motive power and equipment is beginning to tell. A considerable part of the equipment is now in no condition to stand a severe winter. Because of the vital importance of transportation to the successful outcome of the war it is to be hoped that those in authority will see to it that a fair proportion of the needed materials is allotted for railway use. Indeed, it will do little good to commandeer it for other purposes if the railroads are unable to transport it. Those in charge of the railways have done everything in their power to help the nation in its time of need and doubtless have hesitated to put too much stress upon the needs of the railroads. It would seem, however, that the time has come for concerted action in order that sufficient provision may be made to see that they are properly equipped to meet the greater demands that will be made upon them.

Railway Land Grants Now Save Public Millions

"Bread Cast Upon Rails" Gives \$50,000,000 a Year to Government in Military Transportation Charges

By John W. Kean

Transportation Clerk, Navy Department, Washington, D. C.

UNCLE SAM was busy with a short pencil when I entered his office and there was such a pleased expression on his face that I did not have the heart to interrupt him.

Evidently working out a satisfactory solution of the problem he put the pencil carefully away in the fancy vest and looking up with a smile asked, "What is it the Scriptures say, Son, about 'bread cast upon the waters'?"

"Bread cast upon the waters shall return after many days," I replied.

"I knew it was something like that," he said. Then, glancing down at the sheets upon which he had been figuring, he continued, "I have just made the strange and agreeable discovery that bread cast upon the rails also returns after many days."

"You will have to explain that remark to me, Uncle," I said, "I'm not very good at riddles."

"With pleasure," Uncle said. "From 1850 to 1870 I was on a regular Santa Claus spree and gave away over one hundred million acres of land to ambitious nephews with an itching to build railroads. There was a string attached to the gifts, however, in the shape of a proviso that my troops and property were to be granted reductions in rates. Not much importance was attached to the string at the time, because who imagined I would be transporting troops and property to the extent I am today? Here are some figures, however, which show that the little drawback inserted in the grants will bring in fully \$50,000,000 this year. Is that plain talk, Son?"

"It certainly is, Uncle," I answered, "and I imagine fifty million makes quite a nice bouquet of yellow beauties."

A \$50,000,000 RETURN

"Yes, and I must say the boys are presenting it with good grace, as they can well afford to do. My transportation bill this year is simply a whopper. Take the war department alone. My original appropriation for the army was \$4,350,000. We thought it was quite some appropriation at the time, but it turned out to be chicken feed, to talk plain for you, Son."

I acknowledged the corn and Uncle continued: "Then I sat in the Big Game and in June Congress, my banker, gave me a \$221,963,745.42 stack of chips for the Transportation of the Army and its Supplies. That went before I had the seat warm and on September 6 the banker began considering a little request for \$350,000,000 more. The way the game is going I will spend \$500,000,000 for railroad transportation for the army alone. The navy and other departments will cost me \$25,000,000 more."

"You evidently figure then, Uncle," I said, "that the drawback in the grants will bring you in about 10 per cent?"

"Yes, that's a very conservative estimate," Uncle replied. "It has always been a mystery to me why the roads did not keep an accurate record of such deductions, but they never have and there has been no reason why I should keep such a record."

"I understand, Uncle," I said, "that the lines contemplate the establishment of a clearing house in Washington for all government business. If they do I presume they will keep better records on this class of travel which will be very heavy for years to come."

"No doubt, and they should do so," Uncle said. "It was a realization of the value of the grants to me this year, however, that started me on a little historical research and I have certainly come across some very interesting and amusing documents."

"Please tell me about them, Uncle," I said, "I am always interested in anything that affects the railroads."

"Gladly," Uncle said. "You understand, of course, the general history of the grants and that they were made in the first place primarily to promote the sale of the public lands. Then, later, from a humanitarian standpoint; railroads were necessary to provide the early pioneers with a means of protection against the savages. Still later, before there was any means of transportation across the continent, except by prairie schooner, gold was discovered in California, and I donated millions of acres of the public lands to aid in the construction of railroads to the Pacific Coast. In the construction of these transcontinental lines, which were also a military necessity, there are volumes of history that is more thrilling than any fiction."

Uncle interrupted his story, apparently recalling those early days and the brave men and women who laid the foundation of his great democratic country. The story of the land grants promised to be more interesting than I expected, so, after a moment, I said, "Go ahead, Uncle, I thought you were going to read me a lot of dry laws filled with statistics, but you are telling a real story."

"No," Uncle said with a smile and shake of the head, "I haven't told you a story, I have just told you where there were stories. However, I will sketch the land grant history for you in the form of a story if you like—a sort of moving picture as it were."

SOME LAND GRANT HISTORY

"Stephen A. Douglas, 'The Little Giant,' of Illinois, induced me to make the first grant in 1850 to the states of Illinois, Mississippi and Alabama for the construction of a railroad from Dubuque and Chicago to the Ohio river and from the Ohio river to Mobile. 'The Little Giant' is, therefore, our hero. As a result of this grant the Illinois Central and the Mobile & Ohio Railroads were constructed."

"Now, of course, you understand, Son, that we cannot have a story without a villain and the papers and it was right in this first grant that the rascal came upon the scene. To work upon his entrance properly, however, I must go back to the year 1802. In that year I authorized the Secretary of the Treasury to 'view, mark and open such roads in the territory northwest of the Ohio river as, in his opinion, might best promote the sale of the public land.' Then, for the next scene, moving westward to Indiana, in the year 1824, I made a grant of land to that state for a canal to connect the Wabash river with Lake Erie. The grant contained this proviso:

AND PROVIDED FURTHER, that the said canal, when completed, shall be and forever remain a public highway for the use of the government of the United States, free from any toll or other charge whatever, for any property of the United States or persons in their service on public business passing through the same.

"This was the first proviso with reference to reductions in fares and it covered my property and all persons in my service."

"And now we are back to 1850, and the villain. I have

made a thorough search of the records but, so far, have been unable to identify him. The grant of 1850 for the railroads followed the wording of the canal grant with this single exception—the words 'persons in their service' were changed to read 'troops of the United States.'

"All the succeeding grants to the roads also read 'troops of the United States.' As I said, I have been unable to learn who made the change or why it was done. Had no change been made I would today be receiving reductions in rates for all my family instead of for my troops only. It may be the framers of the grant figured such a clause might encourage civilian travel and that it was only necessary for me to transport troops. If that was the reason, they left out the civilians they made a bad guess for I will spend \$500,000 this year for the transportation of my farmer boys in the Department of Agriculture alone. When you consider what I will pay for the rest of my civilian family you can imagine what the rascal cost me."

"He was a regular villain, Uncle," I said with great sympathy, "to change the papers on you like that, but let's forget him if you please and introduce me to the heroine, I am anxious to meet the lady."

I think Uncle realized I was trying to corner him in his little plot of telling the land grant history as a story but he just smiled and reached for another paper, "I have here," he said, "a decision of the Supreme Court, part of which I will read to you:

Was the plaintiff, by reason of being a land grant railroad, bound to transport the troops and property of the United States free of charge, or had SHE a right to a reasonable compensation for such services.

"There SHE is, Son—the railroads. Just at present the damsel is very busy bustling around attending to business but ordinarily she requires her full share of attention."

"Well, we must admit she makes a good heroine, Uncle," I said, "and it is proper that she should receive attention. Now you know, of course, Uncle, that a story must have a comedian,"—"Here," I thought, "is where I have him cornered,"—"May I ask who is your funny man?"

Again Uncle smiled and reached for a paper. "Before I introduce my comedian," he said, "I am going to give you some advice. No doubt, you have frequently wondered why government documents—with a few notable exceptions—were such dry reading. I know you have and I am going to tell you the reason and then introduce my comedian.

"Documents in commercial life are comparatively short lived, but some literary ghoul is always poking through my vaults and bringing to light my past history. A prospector who discovers a pocket of virgin gold is no happier than one of those chaps when he comes across a flowery document that has missed history a million miles. He immediately reproduces the masterpiece for the edification of a humor-loving public, while the disgusted author mutters strange words and turns over in his grave. So be careful what you write, Son, when you are a United States Senator, or some day it will be dug up on you as was this report of the Select Committee of the House on Pacific Railroads and Telegraph, August, 1856. Just to carry out our little plot I will pick the author of this report as my humorous character.

WHEN LAND WAS WORTH 12½ CENTS AN ACRE

"After expressing grave doubts as to whether a railroad could ever be built across the continent 'through those vast mountain regions whose aspiring summits present 12 feet of defying snow to the burning rays of the July sun,' the report continues:

So rapid is the fall of snow, and so resistlessly do the winds sweep over those almost boundless plains, it is quite impossible to gain a distant shelter.

So with a train of cars running up the plain from Iowa or Missouri to the foot of the Rocky mountains, a distance of some 800 miles, how, in a storm, is shelter, or wood, or water, or food to be gained? Arrested 800 miles from Iowa in November, how is a train of cars to be relieved before May? By what means could it even be visited? In such a case the sheltering skill would be useless. To talk of doing business in the

winter season on a road through such a region, though every conductor was a Kit Carson and every traveler a Fremont, would seem to be idle and preposterous.

"He certainly didn't think much of the idea, did he, Uncle?"

"No, but we must make allowances, Son. A minority report is a thankless task. I hope, however, you will take the lesson to heart and if you are ever tempted to do any fancy writing be very, very careful."

"I will certainly do so Uncle," I said. "But just what was your part in the land grant story, to get back to our bacon, or rather bread?"

"Well some of the boys thought I was the Goat," Uncle replied smiling, "and no wonder. But they only saw part of the picture.

"In the 20 years following 1850 I gave away or granted 107,722,553 acres of land to aid in the construction of railroads. This was a territory equal in size to the New England states with New York and Pennsylvania added for good measure. This immense territory was divided among the following 35 railroads:

Alabama & Vicksburg.....	199,102
Alabama Great Southern.....	653,809
Atchison, Topeka & Santa Fe.....	3,007,839
Atchison, Topeka & Santa Fe Coast Lines.....	3,157,473
Central of Georgia.....	302,191
Chicago & North Western.....	3,954,934
Chicago, Burlington & Quincy.....	3,363,297
Chicago, Milwaukee & St. Paul.....	1,465,554
Chicago, Rock Island & Pacific.....	839,404
Chicago, St. Paul, Minneapolis & Omaha.....	3,271,091
Duluth, South Shore & Atlantic.....	434,231
Grand Rapids & Indiana.....	852,521
Grand Trunk.....	6,469
Great Northern.....	2,924,263
Gulf & Ship Island.....	139,113
Illinois Central.....	3,611,620
Lake Shore & Michigan Central.....	141,320
Louisville & Nashville.....	1,580,402
Michigan Central.....	602,468
Minneapolis, St. Paul & Sault Ste. Marie.....	838,228
Missouri, Kansas & Texas.....	705,622
Missouri Pacific.....	397,263
Mobile & Ohio.....	1,156,659
Nashville, Chattanooga & St. Louis.....	67,785
Northern Pacific.....	31,658,331
Pere Marquette.....	412,887
St. Joseph & Grand Island.....	562,933
St. Louis & San Francisco.....	1,280,784
St. Louis, Iron Mountain & Southern.....	2,442,398
Seaboard Air Line.....	1,460,984
Southern Pacific.....	16,012,228
Southern Railway.....	458,556
Texas & Pacific.....	1,001,017
Union Pacific.....	18,306,036
Vicksburg, Shreveport & Pacific.....	463,747
Total Number of Acres.....	107,722,564

"The last grant was made in 1871 and in that year the state legislatures of Indiana, Missouri, Ohio and Pennsylvania passed resolutions protesting against any further grants."

"You were really not surprised were you, Uncle?" I asked. "That certainly was a Santa Claus spree."

"No, I was not surprised," Uncle said. "I must say that once I get started I do not believe in half-way measures. But don't forget that the drawback provision in the grants will be at work as long as the railroads are in existence. I think when the day of final accounting comes Uncle Sam will have a credit on the right side in these land grant deals. Let me also read you part of the majority report of the Select Committee of the House on Pacific Railroads and Telegraph, August, 1856:

No better example can be given of the benefits resulting from the construction of railroads to both public and private property, than that of the Illinois Central Railroad. On the line of that railroad the public lands had been offered for sale for many years without finding a purchaser, and were at last reduced to the lowest minimum price, 12½ cents per acre—

"Think of that," Uncle interrupted his reading to remark. "An eighty in the heart of Illinois going begging for ten dollars. Now listen—"

but after the government had given away one-half to assist in building the road, the other half very readily sold for \$2.50 per acre.

"So you see there are two sides to the picture and I did not make such a bad bargain after all. Nor did the State

of Illinois, judging from the following article in the Chicago Evening Post of May 30, 1856:

The official returns of the new census of Illinois (1856) have just been received. The entire population is over 1,300,000, which is a gain of about 50 per cent upon the census of 1850. By comparing the increase through the several decades and semi-decades since the census has been taken it will be seen that the gain has been much larger during the past five years than in any former period. The railroad system has been developed in Illinois within the last five years, and one of the fruits has been to double the population. A correspondent showed the other day that another way to estimate the value of her land. Add to these the improved society, the multiplied educational and moral influences which follow population, and take advantage of all cheap methods of transportation, and then one may begin to appreciate the advantages of the modern railway system as an engine of civilization.

"You see," Uncle said smiling, "there were publicity experts in those days looking after the interests of our leading lady."

"And the experts of today are no better, Uncle." I said, "only now they get a lot of pictures to help along the good work. Did the building of the lines have the same good effect in increasing the value of your land in other cases as in Illinois?" I asked.

"Yes," Uncle answered. "Of course, the benefits were not always so immediate. Nearly all the acts provided for a grant of every alternate section for six miles on each side of the road and nearly all carried a further proviso that the remaining sections should be sold to settlers at not less than double the minimum price per acre."

"Has the value of the lands granted to the lines ever been figured, Uncle?" I asked.

"No," Uncle answered, "but estimates have been made of the amount received by the lines for lands sold that are fairly accurate. This estimate averages \$10 per acre, or about \$1,000,000,000 for the 107,000,000 acres. Most of the grants excepted mineral lands (other than coal and iron) and this exception has been the source of considerable litigation. Oil, as you know, was discovered on the land granted to the Southern Pacific Company in California and many learned judges have had an opportunity to decide whether, in their opinion, oil was a mineral.

"Then you must not forget the military feature of the grants. The great transcontinental lines received millions of acres of land but their builders were brave men and entitled to help in the construction of lines which were an absolute military necessity but which were through a territory where, as our humorous friend wrote, 'the country was so sandy, sterile and desolate a wolf could not make a living.' This is the same country which the government and the lines have made the supply house for the world."

LAND GRANT RATES

"Your story has certainly taught me that it is dangerous to predict, Uncle," I said, "but there is one point that is not quite clear to me. The clause in the grants stated that you were to have the use of the lines free from toll or other charge and you keep speaking of reductions in rates. Will you clear that up for me?"

Uncle hesitated for a moment and then said with a twinkle in his eye, "You have touched on a rather delicate subject, Son, but I will explain. I sometimes think it was a case of the villain still pursuing me.

"There are two classes of land-grant roads now—free lines over which I pay absolutely no charge for the transportation of my troops and property, and lines over which I pay 50 per cent of the public rate.

"The first grants provided that I was to have the use of the lines free from toll or other charge. These are now the 50 per cent lines. Several of the latter grants contained an additional proviso reading, 'All property and troops of the United States shall at all times be transported over the said railroad and branches at the cost, charge and expense of the company.' These are the free lines and, unfortunately for me, they are not very numerous. The Southern Pacific,

from a point near Sacramento, Cal., to Portland, Ore., is the longest and perhaps the most valuable from my standpoint. There are also free stretches of line on the Missouri Pacific and the Rock Island in Arkansas that came in very handy in figuring rates on the movements to the Mexican border, which you will recall if you are good at remembering ancient history. There are a few more strips, but up to the present, at least, they have not been of much importance so far as my movements of troops and property have been concerned.

"It was the first proviso, however, that started all the trouble. The lines said, 'Go ahead. We admit we are a public highway for the use of your troops and property free from toll or other charge, but we deny that we are under any obligation to furnish motive power or equipment free of charge.'"

"It certainly did look like the fine Italian hand of the villain, didn't it, Uncle?" I said.

"I must confess it did," Uncle replied with a slight shake of the head. "The question, however, was finally submitted to the Supreme Court and I have just been reading the opinion which was handed down in October, 1876. It is very interesting. I have always been particularly fortunate in having in my immediate family experts in handling English and presenting facts in a clear and logical manner. Many of my public documents are masterpieces in this respect and it occurred to me while reading the opinion of the Supreme Court in this land-grant case that here was a document entitled to a place on the roll of honor. I will read you the vital parts of the opinion:

Congress in most of the legislative acts by which it has made donations of public lands to the states in which they lie, for the purpose of aiding in the construction of railroads, has stipulated that the railroads so aided shall be public highways for the use of the government, free from all tolls or other charge for the transportation of its troops or property. The question has arisen between the railroad companies owning these roads and the officers of the government whether this reservation includes the free use of the roads alone, or transportation also. The companies claim that if they give to the government the free use of their roads it is all that is required of them. The government claims that it is entitled to have free transportation on the roads, and that it is the duty of the companies to perform it; and Congress has refused compensation for such transportation, giving the companies, however, the right to appeal to the Court of Claims. That court having been appealed to, and having decided adversely before us for consideration, we have now before us the cases and are now

The manner in which the question arises is stated with sufficient accuracy by the counsel of one of the appellant companies as follows:

"I'll bet he was the villain, Uncle," I interrupted, but Uncle only smiled and continued reading:

Was the plaintiff, by reason of being a land-grant railroad, bound to transport the troops and property of the United States free from any toll or other charge, or had she a reasonable right to a compensation for such services?

"I knew it, Uncle," I interrupted, "see how the rascal called the plaintiff a 'she' just to work on their sympathies." Uncle continued reading:

The case turns upon the construction that should be given to the clause in the Act of 1864, which declares that "the said railroad shall be, and remain, a public highway for the use of the government of the United States, free from all toll or other charge for (upon) the transportation of any property or troops of the United States."

And the counsel for the appellants analyzes this provision as follows—

1. That this is a legislative declaration of three things—
2. That the railroad shall be a public highway.
3. That the United States shall have the right to use the same for the transportation of its troops and property.

3. That the United States, in the transportation of its troops and property over such railroad as a public highway, shall not be required to pay any toll or other charge."

"There is nothing like a good counsel, is there, Uncle?" I again interrupted.

"There certainly isn't, Son," Uncle said. "Now listen to the opinion of the Court:

It is somewhat singular that a provision apparently so simple in its terms should give rise to such wide differences of opinion as to its true construction. The difficulty arises from the peculiar character of a railway as a means of public travel and transportation. The case of a turnpike or canal would have furnished no difficulties whatever. Those thoroughfares are usually constructed and owned by companies who have nothing

to do with transportation thereon. They merely furnish the thoroughfare. Had the provision in question related to public works of this kind, it would have been clear that the right reserved to the government would have been merely the right to use the works themselves (the turnpike or canal) free from toll. The words "free from toll or other charge for the transportation of property or troops" would have referred, by necessary implication, to transportation performed by the government itself, either in its own carriages or vessels, or in carriages or vessels procured and employed at its expense. No one would imagine for a moment that the turnpike or canal company would be bound to furnish the means of transportation, much less the propelling power and labor for performing it.

"It does begin to look a little bit different, doesn't it, Uncle?" I said.

"Oh, yes," Uncle replied. "Each time I read that far I am ready to admit they were right, but the next paragraph advances some rather startling ideas and I will read it to you:

It is undoubtedly familiar to most of those whose recollections go back that far that railroads were generally expected to be public highways, on which every man who could procure the proper carriages and apparatus would have the right to travel. This was the understanding in England where they originated. The Railway Clauses Consolidated Act, passed in 1842, provided in detail for the use of railways by all persons who might choose to put carriages thereon, upon payment of the tolls demandable, subject to the provision of the statute and the regulations of the company.

"That is rather startling, Uncle," I said. "The recent car congestion would be a child's puzzle compared to the confusion that would occur if everybody who could afford a car and an engine should start over the tracks."

"It does sound like a joke, Son, but the learned Court explains in the next paragraph, which reads:

But the ascertained impracticability of the general and indiscriminate public use of these great thoroughfares does not preclude their use by transportation companies having no interest in the roads themselves. Such companies, in fact, are actually engaged in conducting a vast carrying business on the principal lines of railroad throughout the country. Nor does it preclude the idea that it may be of great importance to the government, in conducting its various operations in peace and war, to have the free use of railroads as thoroughfares whenever it chooses to assume the conduct and management of its own transportation business thereon.

We are of the opinion that the reservation in question secures to the government only a free use of the railroads concerned, and that it does not entitle the government to have troops or property transported by the companies over their respective roads free of charge for transporting the same.

"It really was a simple case when you come to think about it, Uncle. But I noticed that the Court stated that you had the right to use the roads as thoroughfares whenever you decided to assume the conduct of your own transportation business. Why was it you did not build the roads yourself instead of donating the land, and do you expect ever to take over the complete ownership and operation of the railroads?"

"What are you doing, Son, still trying to corner me?" Uncle asked with a terrible frown but with a twinkle in his eye. "However, I will explain the rate question a little more fully and then try to answer you.

"As a result of the decision of the Supreme Court in all cases where the grants provided that I was to have the use of the road free from toll or other charge, or where the acts provided that Congress was to fix the compensation, as was done in a few cases, I now pay one-half the public rate. The agreement to pay one-half was in the nature of a compromise to cover use of motive power and equipment. Where the act provided that 'All property and troops shall at all times be transported over the said railroad and branches at the cost, charge and expense of the company,' as I previously explained, there is no payment whatever.

UNCLE SAM AND HIS NEPHEWS

"With the rate question cleared up, Son, at least I hope I made it clear, we will take up your nice simple little question—Why didn't I build the railroads myself and am I ever going to take over the ownership and operation of the lines?" and I am going to answer you first in true Yankee fashion by asking you another. Did you ever hear how I got my name Uncle Sam?"

"No," I answered, "I never did. I always thought it came from the initial letters of United States."

"No," Uncle said, "it was not derived from United States. According to the most authentic records the name came about in this manner. Immediately after the declaration of war with England in 1812, Elbert Anderson of New York, a contractor, visited Troy and purchased a large quantity of provisions for sale to the government. He employed Ebenezer and Samuel Wilson as inspectors, Samuel being generally known as Uncle Sam."

"The Wilson family seems to continue to play a prominent part in our history," I interrupted Uncle to gently remark.

"Yes, it does, Son. It was the duty of the two Wilsons at Troy, particularly Sam, to inspect the provisions before packing them for shipment to the army. The boxes were marked E.A.-U.S., standing for Elbert Anderson and United States. One of the workmen was asked one day the meaning of the letters and he jokingly replied, 'Elbert Anderson and Uncle Sam,' by 'Uncle Sam' referring, of course, to Sam Wilson. The joke became popular among the workmen and Uncle Sam Wilson was frequently jollied by the men on the increase in his possessions.

"Many of these men later joined the Army and their joke accompanied them, boxes marked 'E.A.-U.S.' being invariably referred to as 'Uncle Sam's goods.' The joke soon appeared in print, took the popular fancy and I suppose I will always be Uncle Sam."

"That is interesting, Uncle," I said, "how do you like your name?"

"Oh, I like it very well," Uncle replied, "and I often think how appropriate it is. Have you a rich uncle in your family or do you know one among your friends? If you do you will better appreciate why I say it is appropriate. I certainly have a fellow feeling for all rich, old bachelor uncles.

"When my nephews decided that I was somewhat of a necessary nuisance they drew up a document called a Constitution, which informed me in very polite language just where I stood. Among a few of the so-called privileges granted me was the right to establish post offices and post roads. I suppose under this privilege I could have built the railroads, or, if not, they also gave me the privilege of promoting the general welfare of the family, and that was certainly quite a privilege. I am doing a little promoting of the general welfare in Alaska today.

"In the building of our railroads, however, and in the building of many of our other great commercial enterprises, those dear nephews of mine would come to me and say, 'Now, Uncle, you have enough trouble, why bother with this job?' The best way is for you to loan us the money, or help us out with lands or bonds, or high tariffs. Besides, we can do it better than you, anyway.' I'm a good-natured man, but some day that last remark is going to get a rise out of me and then the boys would better take to the tall timbers. I would not mind it so much if they would say they can do it as well, but when they brag about how much better they can do it, Uncle Sam gets a little sore.

"In a general way that was how it happened with the railroads. The boys came to me for help and I am proud today of the work they accomplished.

"The only thing that grieves me at times is the selfishness of some of the family. I must say, however, that this is not generally true of the railroad boys. But I help some of my nephews to get on their feet and then when they get rich and powerful they think they are bigger than I am and they would trim me for my whiskers if I did not watch them.

"And if the boys would not quarrel so much among themselves I would be happier—and this time I will not leave the railroad boys out. Then when I try to settle their disputes they turn on me like a fighting husband and wife and I get blamed for the whole fracas. I feel sometimes like the

little boy who said nobody loved him and he was going out in the garden and eat worms."

"Your name certainly does suit you, Uncle," I said with great sympathy. "I think rich, old bachelor uncles must lead a hard life. And now for my last question, and I promise not to try to corner you again—Do you think you will ever take over the ownership and operation of the roads?"

"You evidently believe, Son," Uncle said with a smile and the old twinkle in the eye, "in leaving the hard one for the last. I am not going to give you an answer to that question now, Son, but I will make a bargain with you.

"The railroad boys have been doing a great work for me so far in this terrible war that has been forced on us. If they keep it up—"

Again Uncle interrupted his story as in the beginning, when he stopped to think of the brave unselfish men who had laid the foundations of the Republic. This time he was evidently thinking of a few brave, unselfish men who were striving to protect the completed structure. In the first instance I had called his thoughts back to the story, but this time I did not have the heart to interrupt his thoughts. He finally rose from his chair and coming around with a smile, though a somewhat serious smile, to where I also stood he

bargain and we will shake on it—come around after the war is over and I will tell you if I think I ought to take over the railroads."

"All right, that's a bargain, Uncle," I said. Then, knowing he wouldn't mind a little joke, I continued, "but judging from the amount of money you say you will owe them, Uncle, maybe you will be lucky if the railroads don't take over the government."

"Oh, I guess not, Son," he said as he threw back his head and gave a good hearty laugh.

But I glanced back as I went out the door and he was back at his desk and feeling around in the fancy vest for the short pencil.

LOCOMOTIVE TERMINAL DETENTION RECORDS

The demand for power is now so great that every effort must be made to keep it working effectively a maximum percentage of the time. One of the largest sources of delay is at the terminal and any means by which this delay can be analyzed and corrected will serve to increase the total locomotive supply. The Pennsylvania Railroad uses a form for gathering this information which shows the movement

M. P. 99

PENNSYLVANIA RAILROAD COMPANY

MOVEMENTS OF LOCOMOTIVES AT _____ DIVISION

FROM MIDNIGHT TO MIDNIGHT _____ 191 _____

LOCOMOTIVES ARRIVING														
LOCO. NUMBER	DIVISION	KIND OF SERVICE	TRAIN NUMBER	ENGINEMEN	FIREMEN	TIME CREW IS AVAILABLE	ARRIVED AT TERMINAL	TIME FROM TERMINAL TO PIT TRACK	ARRIVED AT PIT TRACK	TIME FROM PIT TRACK TO ENG. HOUSE	ARRIVED AT ENG. HOUSE	TIME FROM ENG. HOUSE TO PIT TRACK	TIME FROM PIT TRACK TO ENG. HOUSE	REMARKS
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

LOCOMOTIVES DEPARTING														
TRAIN NUMBER	TIME ORDER WAS PLACED	TIME ORDER FOR SERVICE	ENGINEMEN	TIME REPORTED	FIREMEN	TIME REPORTED	TIME LOCO. LEFT STORAGE TRACK	TIME LEAVING PIT TRACK WITH TRAIN	TIME FROM SERVICE TO TIME ORDERED	TIME FROM SERVICE TO TIME ORDERED	TIME FROM SERVICE TO TIME ORDERED	TIME FROM SERVICE TO TIME ORDERED	TIME FROM SERVICE TO TIME ORDERED	REMARKS
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

Fig. 1—Daily Report for Recording the Movement of Locomotives Through Terminals

said, "There are many indications, Son, that out of this war will come not only a broader and better understanding between governments and the people governed, but between different classes of the people. We have been accused, and perhaps with some truth, of worshipping success and money and of ignoring the rights of others to gain our ends. There are many indications that out of this war will blossom a flower of higher and purer ideals; that success and money, for themselves alone, will not be the ultimate aim, but success and money interwoven with service.

"But I must stop preaching, Son. You will also recall that I taught you it was dangerous to prophesy. Here is my

of a locomotive from the time it arrives at the terminal until it leaves.

The form shown in Fig. 1 is made out daily by the round-house force and includes information of interest to the transportation department, as well as the mechanical department. This form furnishes a complete record of all locomotives arriving and departing from the enginehouse between midnight and midnight. At midnight all computations of time automatically cease and the locomotive numbers of all locomotives remaining within the enginehouse or yard territory are carried forward to the sheet for the following day and the computation of the time starts at 12:01 a. m. The

time shown under the column immediately preceding the column in which the midnight time is recorded should be carried forward to the next daily sheet for information. A second form, Fig. 2, gives a daily summary of the average time the locomotives spend in passing from one point to another in the terminal.

Referring to Fig. 1, the daily detail report of each locomotive: Columns 1, 2, 3, 4, 5 and 6 are self-explanatory. Column 7 shows the time at which the crew shown in columns 5 and 6 will again be available for service. Column 8 shows the time the locomotive and train arrive at the terminal, this time being taken from the engineman's time card or work report. In general the point at which this time is to be taken should be that at which the yard delays begin. Column 9 shows the time elapsing between the time of arrival at the terminal and the arrival of the locomotive at the pit track and is one of the items tabulated in column A (Fig. 2) of the summary. In case midnight intervenes between the time the locomotive arrives at the terminal and the time it arrives at the pit track, the time in column 9 is computed to midnight and the locomotive number and the time shown under column 8 are carried forward to the sheet for the following day. Column 10 shows the time that the locomotive arrives at the pit track or other points at which

between locomotives requiring under 24 hours for repairs and those requiring more than that.

Columns 16 to 23 are self-explanatory, column 23 being the time at which the locomotive and crew leave the engine-house territory. Column 24 shows the time that the locomotive and train clear the terminal yard for freight trains, or the time the train leaves the terminal for passenger trains. Column 25 shows the time between the time the locomotive was ready for service and the time it was ordered, being the difference between columns 14 and 18. This is shown in column D, Fig. 2, of the daily summary. Column 26 shows the time between the time the locomotive is ready for service and the time it leaves the terminal with its train. This time is shown in the summary sheet under E. Column 27 shows the time the engine has spent in the hands of the mechanical department from its arrival at the pit track to the time it is ready for service, or, in other words, the time elapsing between that recorded in columns 10 and 14, or, again, the sum of the computed time shown under columns 11 and 13. This information is shown in column F on the daily summary, Fig. 2. Column 28 shows the time the engine is at the terminal for which the transportation department is responsible, it being the sum of the time shown in columns 9 and 26. This information is shown in the

AVERAGE MOVEMENT OF ROAD FREIGHT LCOMOTIVES.....DIVISION. AT.....ENGINEHOUSE.										
MONTH OF.....1917.										
Date	Number of Locomotives Despatched	Column 9	Column 11	Column 13	Column 25	Column 26	Column 27	Column 28	Column 29	Remarks.
		A	B	C	D	E	F	G	H	
		Hrs. Mins.	Hrs. Mins.	Hrs. Mins.	Hrs. Mins.	Hrs. Mins.	Hrs. Mins.	Hrs. Mins.	Hrs. Mins.	
1										
2										
3										
30										
31										
Notes: Column 9 Letter A—Time from Terminal to Pit Track. Column 11 Letter B—Time from Pit Track to Enginehouse. Column 13 Letter C—Time from Arrival at Enginehouse to Ready for Service. Column 25 Letter D—Time from Ready for Service to Time Ordered. Column 26 Letter E—Time from Ready for Service to Leaving Terminal with Train. Column 27 Letter F—Time from Arrival at Pit Track to Ready for Service. Column 28 Letter G—Total Time from Arrival at Terminal to Arrival at Pit Track, Plus Time from Time Ready for Service to Departure from Terminal. Column 29 Letter H—Total Time from Inbound Terminal to Departure from Outbound Terminal.										

Fig. 2—Summary of Average Movement of Locomotives Through Terminals

the engine crew is relieved, this time to be noted by the engineman on his work report. Column 11 shows the time the locomotive takes in passing from the pit track to the enginehouse or the point at which the repairs are to be made and is the difference of the time shown in columns 10 and 12. Column 11 is shown in Fig. 2, the summary, as column B. The same rules apply regarding midnight as before described. Column 13 shows the time elapsing between the time the locomotive arrives at the enginehouse (column 12) and the time it is ready for service (column 14). This information is shown in column C in the summary. Column 15 is used to make any notations that may seem desirable.

Where a locomotive arrives at an enginehouse and is to be sent to the shop, it is to be dropped from the daily report sheet after the time shown under column 12, and locomotives arriving at a terminal from the shop begin their record on the daily sheet at column 12. Where locomotives remain at enginehouses for heavy repairs, a record of the repairs to be made is noted on each daily report. The time in column 13 may or may not be kept separate for locomotives requiring over 24 hours for repairs and separate averages computed as

daily summary sheet under column G. Column 29 shows the total time the locomotive spends in the terminal which is equivalent to adding the computed time shown under columns 27 and 28 of Fig. 1, or columns F and G in Fig. 2.

By this means the movement of each locomotive and the average movement of all locomotives through a terminal is readily determined. The performance may be analyzed and the work of various terminals checked. Conditions, of course, will vary at different engine terminals, which makes the comparison of one terminal with another difficult; but where a locomotive seems to spend too much time either in the hands of the mechanical or the transportation department, a positive record of just what has transpired is at hand and opens the way for a satisfactory investigation. This information is usually gathered by the clerk at the roundhouse who keeps the enginemen's reports. At large terminals, separate sheets may be used for locomotives in each kind of service, such as passenger, freight and work or shifting. Each daily report is in the hands of the superintendent of motive power early the next morning with the averages determined, so that he is able to get a general idea of each terminal under his jurisdiction.

Three New Interstate Commissioners

**Majority of the Commissioners Are Lawyers as Before;
New England and the Pacific Coast Are Represented**

ROBERT W. WOOLLEY, former director of the mint; Clyde B. Aitchison, solicitor for the valuation committee of the National Association of Railway Commissioners, and George W. Anderson, United States district attorney for Massachusetts, were nominated by President Wilson on September 29 for appointment to the Interstate Commerce Commission; Mr. Woolley for a term ending December 31, 1920, to succeed the late Judson C. Clements; Mr. Aitchison for a term ending in 1921, and Mr. Anderson

was appointed from Colorado. Commissioner Daniels from New Jersey and Commissioner McChord from Kentucky, the commission would seem to be fairly representative geographically. The only large group of states not represented is the Southwest, which circumstance may or may not be accounted for by the attempted secession of the largest one of the neglected states, so far as matters of railway regulation are concerned.

It is expected that announcement will shortly be made, if the President's appointments are duly confirmed by the Senate, of a reorganization of the commission into divisions, as authorized by the new law, to have special jurisdiction over various departments of the commission's work, with the full powers of the commission, subject to its review.

Robert Wickliffe Woolley, of Fairfax, Va., has recently been director of publicity for the first Liberty Loan. He was born at Lexington, Ky., April 29, 1871, attended the State University of Kentucky in 1886 and 1887; left college on account of ill health and engaged in newspaper work on the Lexington Leader in 1893. He was sporting editor of the



Robert W. Woolley

for a term ending in 1922, these for the two additional commissioners authorized by the law of August 9, bringing the membership up to nine. The nominations were sent to the Senate and referred to the Committee on Interstate Commerce with no likelihood of opposition. Mr. Woolley's experience has been principally that of a newspaper man. Mr. Aitchison is a lawyer and was formerly chairman of the Oregon Railroad Commission. Mr. Anderson is also a lawyer and was a member of the Massachusetts Public Service Commission for one year (1913-14).

With a 50 per cent infusion of new blood the commission will, therefore, have a majority of five lawyers, including Commissioners Harlan, Hall and McChord, also a majority of five former state railway commissioners, including Commissioners McChord, Meyer and Daniels. As the law provides that no more than five of the commissioners shall be of the same political party, it is proper to remark that Mr. Woolley and Mr. Anderson are Democrats and Mr. Aitchison a Republican.

It is understood that one of the considerations influencing these appointments was a purpose to give representation on the commission to the Pacific Coast and to New England. Mr. Woolley is a resident of Virginia. As the central west is now represented by Commissioners Clark of Iowa, Harlan of Illinois and Meyer of Wisconsin, while Chairman Hall



George W. Anderson

Chicago Tribune in 1896 and 1897, and on the staff of the New York World in New York and Washington from 1897 to 1905 and from 1907 to 1909. From 1909 to 1911 he was engaged as magazine writer, and in 1911 and 1912 he was chief investigator for the Stanley Commission, investigating the affairs of the United States Steel Corporation. In 1912 he became chief of the bureau of publicity for the Democratic National Committee, and in 1912 and in 1914 he also edited Democratic campaign textbooks. From April 30, 1913, until March 3, 1915, he was auditor of the treasury for the In-

terior Department, and on the latter date he was appointed director of the mint, which position he resigned to take charge of publicity for the Liberty Loan.

Clyde B. Aitchison was born February 22, 1875, at Clinton, Ia. He practiced law at Council Bluffs, Ia., from 1896 to 1903, and at Portland, Ore., from 1903 to 1907. He was clerk of the State Tax Commission of Oregon from June, 1905, to July 1, 1906, and was one of the authors of the Oregon Railroad Commission law adopted on February 18, 1907. He was appointed a member of the Railroad Commission of Oregon on February 18, 1907, for a short term, was again elected a member in June, 1908, made chairman in January, 1911, and re-elected on November 5, 1912. He resigned from the Oregon Commission last year to become solicitor for the valuation committee of the National Association of Railway Commissioners, and in this position has maintained an office in Washington and taken an active part in representing the interests of the state commissions in connection with the valuation of railroads being made by the Interstate Commerce Commission.

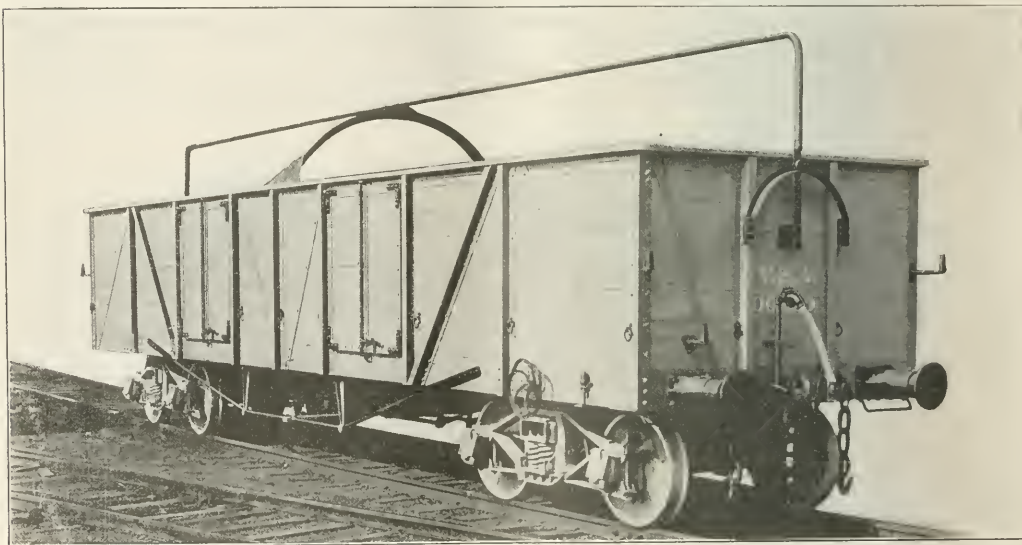
George Weston Anderson was born at Acworth, N. H.

THE FIRST U. S. A. CAR FOR SERVICE IN FRANCE

The car builders have completed the first car on the government's orders for about 13,000 cars for the American forces overseas. The car shown in the illustration is a standard gage high side gondola and is one of the original order of 6,000 standard gage cars reported in the *Railway Age Gazette* of August 17. The car is stenciled "New 9-17," apparently meaning that it was completed some time in September.

The car has a capacity of 33 tons, this comparing with the usual four-wheel French car of not over 20 tons capacity. It is 36 ft. in length, its cubical content is 1,386 cu. ft., and its weight is 32,800 lb.

The car body is built largely to French standards with side buffers and screw couplings, the last being necessary as it will operate with French rolling stock. It is, however, carried on American arch bar trucks with standard M. C. B. journal boxes and is fitted with standard American air brake equipment. The rod over the top of the car is to support



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This Is the First of 13,000 Cars Now on Order for the Government

September 1, 1861, was graduated from Cushing Academy, Ashburnham, Mass., in 1882, from Williams College in 1886 and from Boston University Law School in 1890. He has been engaged in the practice of law at Boston since 1890, and was Democratic candidate for the office of attorney general of Massachusetts in 1911. On July 1, 1913, he became a member of the Public Service Commission of Massachusetts, resigning on November 1, 1914, to become United States district attorney for Massachusetts. Last winter he was appointed special assistant to the attorney general of the United States in charge of the conduct of an investigation of matters pertaining to the prices of food supplies. As public service commissioner he had a reputation for independence and public spirit, and both in that position and in the district attorneyship he has had opportunity to familiarize himself thoroughly with the peculiar transportation conditions which now prevail in New England and which, no doubt, were in the President's mind when he chose a Boston man for the new commissionership.

a tarpaulin to protect the car's contents, this rod being adjustable so that it may be swung down along the side when necessary.

EQUIPMENT EXPORTS IN AUGUST.—Exports of cars and parts from the port of New York in August, 1917, amounted to \$1,095,476, as compared with \$768,960 in August, 1916, according to a report of the National City Bank of New York. Locomotive exports for the same month totaled \$898,387, as compared with \$1,299,992 in the previous year. Steel rails exported totaled \$813,746, as compared with \$350,189.

TRANS-AUSTRALIAN RAILROAD NEARLY FINISHED.—Although hindered by the war, construction of the great Trans-Australian Railroad is nearing completion, and advices from Melbourne state that it will be finished this year. The work was begun in 1912. The line will connect eastern and western Australia, and will have cost the builders upward of \$30,500,000. The new line is 1,063 miles long.

The Government Position on Valuation*

The Attitude of the Federal Forces on the More Important Questions Presented by the Texas Midland

By C. A. Prouty

Director, Division of Valuation, Interstate Commerce Commission.

THIS memorandum is in no sense intended as a brief upon the law questions involved. The solicitor of the commission has filed such a brief, which must be accepted as stating the legal claim of the division of valuation upon all points. But many of the questions presented are not legal in any proper sense. Assuming that the courts must finally decide the question, that decision will not be controlled by ordinary legal considerations.

Some of these questions are administrative and refer to the manner in which the valuation shall be made and returned to Congress. The Congress has indicated the thing to be accomplished; manifestly the commission with its practical knowledge must have a considerable discretion in determining the manner of that accomplishment.

The answers to other of these questions depend upon economic considerations. They are not governed by statutes or legal precedents. The law of valuation is still in a plastic state, and while courts and commissions may have discussed these questions and even decided what should be done in particular cases, the law itself can not be said to be established. The decision of this commission will go far toward fixing the law in many instances. It is therefore more important that the commission should clearly understand the practical question presented and the general considerations which should govern its disposal than that it be regaled with long extracts from judges and commissioners who have looked at the question from a single angle and who have had neither the information nor time to think the matter out to a correct conclusion.

It is mainly in this view that the present memorandum is prepared. I have not attempted to cite authorities, but rather to lay before the commission the practical situation and the reasons which have controlled the division of valuation.

As a member of the Interstate Commerce Commission I several times joined with my associates in recommending to Congress that it provide for a valuation of railroad property, and in so doing I for one understood that a valuation in dollars of the property as a whole was called for. There can be little doubt that a majority of the members of the Congress which enacted this measure understood that it provided for a statement of the value of the railroad properties dealt with in money and that the act was so accepted by the country at large.

It is still my own conviction that an ultimate value for rate-making purposes should be stated and that the full benefit of this valuation can not be realized unless this be done. The vice of the railroad situation today is uncertainty. If the present system of providing public service by private capital is to be continued, some way must be found to assure that capital of the treatment which it will receive. It is difficult to see how this can be done until the value of the property now devoted to that service has first been determined.

This does not, however, at all mean that any part of the work now being done or of the money now being expended is thrown away because the commission is not required to establish at this time such ultimate value. Before such a value can be named the facts which the Commission is collecting and reporting to Congress should be before the tri-

bunal which fixes it. The facts are being prepared under the present act and a final value can be quickly stated when Congress has determined by whom and possibly by what rule such value shall be determined.

The carrier claims that in showing cost of reproduction we must look back to original conditions and allow for the clearing and grubbing which was actually done in building the railroad, while the division of valuation insists that only such clearing and grubbing should be allowed for as must have been done at the date of valuation. The question is one of principle and is: In showing cost of reproduction, shall natural conditions be assumed as they exist today, or shall we inquire what those conditions were at the time of the original construction? Both theories have found advocates in the past and both have been applied by commissions and courts. It can not be said that the weight of authority preponderates in favor of either.

There has been a manifest disposition upon the part of many courts and commissions to include in cost of reproduction everything which ought to be included in the fair value of the property. The evaluator seems to have assumed that cost of reproduction when ascertained would measure the value of the property and to have embraced in reproductive cost, for this reason, everything which ought to go into a final fair value.

This has not been the view of the division of valuation. The Supreme Court has said that cost of reproduction does not alone determine the fair value of the property, for rate-making purposes at least, but that other matters must also be considered. Congress by the valuation act has required the commission to state the principal facts which must be known and considered in determining fair value, including among these cost of reproduction. It has seemed of importance to report the exact thing called for by Congress.

The railroads of this country are the result of a process of development. They were not constructed by a single impulse, but have gradually grown into their present form. Steel and masonry have taken the place of wood. Trestles have been filled. Additional tracks have been added. To attempt to reconstruct the road in the manner in which it was constructed would be manifestly impossible. The attempt is to take the railroad as it exists today and to reconstruct that railroad in kind, for the most part, by one impulse in the most economical manner by present methods and under present conditions.

To attempt to reproduce these properties historically would involve much uncertainty and possible error. It is necessary to depend upon the statement and the record of the carrier in some cases, as in the location of hidden quantities which can not be seen and examined; but in so far as it is possible to see and observe it has been felt that the Government party should be required to note what actually exists and not to report as though it were a fact what merely comes to it as hearsay from some other source.

The objection to the adoption of this theory is that many items of expense which were actually incurred by the carrier in the construction of its property are not reflected in reproductive cost. This item of clearing and grubbing is an illustration. So also if a building were located upon the right of way which was moved at the expense of the carrier or if the location of a highway was changed for the benefit of the

* Abstracted from a memorandum filed with the Interstate Commerce Commission with reference to the valuation of the Texas Midland.

carrier and at its expense, these items would not appear in cost of reproduction.

It must be admitted that such items do not appear in reproduction cost upon the present-condition theory. The expense would not be incurred if the property were to be reconstructed today and therefore is not included. The land through which the road runs has been cleared and tilled and has thereby increased in value. The carrier is given the benefit of that change in conditions. If the land is to be valued in its present condition, why should not clearing and grubbing also be assessed under the same conditions?

No attempt is made to show as reproductive cost the actual cost of producing this property as it was produced. In some instances and in some respects the original cost was greater and in others less. The commission is required to show the original as well as the reproductive cost and all these items enter into such original cost.

It has been the belief of the division that reproductive cost should mean exactly what the statute calls for, and that is "cost of reproduction new." The division of valuation has attempted to report just that thing, namely, the cost of reproducing the property actually in existence under present conditions by present methods and at present prices. This cost of reproduction does not necessarily represent the fair value upon which the carrier is entitled to a return, but what it does represent is clearly and exactly known. If the carrier claims an allowance for anything not embraced by reason of what has transpired in the past, that particular thing can be made the subject of investigation and allowed for if it should be. By adhering steadfastly to this rule much uncertainty, confusion, and possible duplication will be avoided, and at the same time there will be no danger of omitting any item to which the carrier is entitled.

This would seem to be one of the matters about which the administrative discretion of the commission should prevail. Within certain limits the commission may certainly determine what it will show as a part of cost of reproduction new.

INDUSTRY TRACKS

There are in this country many spur tracks serving private industries. It is claimed by the carriers that in all cases where the locomotives of the carrier pass over these tracks for the purpose of making deliveries to and receiving traffic from the industry the track is used by the carrier and should be inventoried to it. The division of valuation does not concede this. Such tracks, in its opinion, are not used by the carrier for its purpose as a common carrier within the meaning of the valuation act, but rather are used for the joint benefit of the shipper and the carrier.

In the view of the division it should be assumed that these tracks will be constructed in the hypothetical reproduction of the property exactly as they were constructed and that the carrier should be allowed for its interest in the property and no more. These tracks have been constructed under a variety of contracts. Sometimes the carrier procures the right of way and constructs the track entirely at its own expense. In such case the track is the property of the carrier and should be inventoried to it. In other instances the industry constructs and maintains the track entirely at its own expense. In these cases the carrier is allowed nothing whatever on account of the track. The mere fact that its locomotive runs in and out over this track is no reason why the track should be inventoried as property used by the carrier for its purposes as a carrier. This is in no sense property which the carrier has devoted to the public use.

In the great majority of instances the track is constructed and maintained partly at the expense of the carrier and partly at the expense of the industry, and in such case each party is credited with the amount which belongs to it.

It generally happens that the carrier has under the contract of construction the right to remove, upon the termina-

tion of the use, the rails, ties, and other movable property. It usually enjoys that right even though these articles of property may have been paid for by the industry. If the carrier enjoys the right of removal, whether it furnished the property or not, it is credited with these items of property and also with the tracklaying and surfacing which would be required to put them in place. As a rule the land upon which the track is located belongs to the industry. The industry may at any time terminate the use, and in that event the land reverts to it. Upon this condition nothing is allowed the carrier for the land. It is not believed that it has any such title to it or interest in it as entitles it to make that the basis of a claim for earnings.

If property is jointly owned by two or more railroad companies that property appears in the inventory of each of the owners. Where property is owned by one railroad company but used exclusively by another it is inventoried to the owner but it also appears in the inventory of the using company. The details will be given but once and will ordinarily be found in the inventory of the owner, although in some cases they may appear in that of the user where the relation of the user to the property is really that of an owner. When property is both owned and used by one railroad company which gives to some other railroad company a qualified use in the property in common with itself, that property is inventoried to the owner and is classified as owned and used by the owner. While reference is made to the fact of such use in the engineering report and the tentative valuation, the property itself does not appear in the inventory of the company having the qualified use, and this is the thing of which the carrier in this case complains.

As a practical matter it would require an immense amount of work to separately inventory every piece of track and every facility in which and over which a railroad other than the owner may have some right of use. These track-age rights are so interlaced and so involved as to make it almost impossible to untangle them and to state separately the value of each piece of property involved. While this might be done it certainly ought not to be attempted in view of the enormous expense involved unless some good will result. Under the present system every piece of railroad property which is owned or used for common carrier purposes is valued and the statute in that respect has been literally complied with. It would serve no useful purpose to attempt to state separately and by itself the value of each piece of property in which some company other than the owner may have an incidental use in common with the owner.

APPRECIATION

Most units of property which enter into the construction and operation of a railroad improve at the very first under use. While, however, this is true at the very outset it speedily comes to pass that the different units which enter into the property begin to deteriorate. After a comparatively few days the property ceases to appreciate and begins to depreciate. Rails, ties, cars, engines, are all growing older and all become in a very short time less valuable than when new.

To this rule that the physical property of the railroad depreciates the roadbed forms an important exception. This item of property grows better with time instead of worse. Without inquiring for the moment just how or why this improvement occurs, the testimony in this case clearly shows and it must be admitted as a physical fact, that a seasoned roadbed is of more value than a new one. It costs less to maintain and the same amount of traffic can be handled over it at less expense. Should the commission attempt to ascertain and report the value of this appreciation?

There is nothing in the valuation act which expressly requires this. Clearly it should not be shown as a part of the cost of reproduction new, for it does not exist in the property when new. It is only with lapse of time and as the property

becomes old that the appreciation takes place. The natural connection in which to show this would be along with depreciation. Just as other parts of the property depreciate, so this part appreciates. The Supreme Court of the United States has said that appreciation should be added to and depreciation subtracted from the cost of reproduction new. The act, however, does not require this. Appreciation might perhaps be properly shown as an additional value or element of value, but this provision of the act seems to apply to intangible rather than physical property, and this appreciation is a physical fact which must be reported and valued as such, if at all.

It was the evident intention of the framers of this act to provide for the statement in some form of every fact which might have a bearing upon the final value of these properties. It was also the plain intent to show the condition of the property at the date of valuation so that its then value might be determined. This being so, it seems to me that the commission should, if it can be done, place a value upon this physical change which has taken place in the property since new. Unless that is done it will be impossible to show the physical value of the property which is being devoted at a given time to the public service. There is every reason to suppose that the Supreme Court would hold that no final value could be fixed upon which a fair return should be allowed without considering this element of appreciation.

How is the value of this appreciation to be ascertained? This is the serious question. The witness for the carriers are all positive in their assertion that appreciation does exist, and this is admitted, but no one of them clearly points out a basis for putting this physical fact into dollars. There is some attempt to show that it has cost the carrier a certain amount and that this cost is the fair measure of its value. Were it possible to state what appreciation has in fact cost, that probably would be the most satisfactory way of determining its value, but appreciation under the accounting rules of the commission costs the carrier nothing whatever. The entire expense of doing the things which have been done must under the rules of the commission be charged to cost of operation. No part of those expenditures can properly appear in the investment account.

Unless, therefore, the commission is prepared to change its accounting rules and to hold that a portion of these maintenance expenditures can properly be charged as an addition or betterment to the property, which can not be done and never will be done as a practical matter, there is no such thing as the cost of appreciation. The property has improved. It is of more value at the end of the five years than when operation began, but that improvement is due to natural processes; it has not been produced by any act of the carrier and it has not involved any expenditure of money upon the part of the carrier. On the whole, it must be apparent that if the carrier has earned that to which it is entitled—that is, an amount sufficient to pay its operating expenses, the depreciation in its property, and a fair return upon the investment—there is no reason in equity why it should be allowed anything on account of this appreciation, which is entirely a process of nature and for which no expenditure whatever has been made by the carrier.

But the question is not what effect shall be given to appreciation in determining the final value of the property. Appreciation is a physical fact; the seasoned roadbed is worth more than the new one. What in dollars is the value of this change? I have endeavored to show that this value can not be stated in terms of cost, because under the rules of the commission solidification and adaptation cost nothing.

In my own opinion the commission ought not to fix any definite figure for appreciation until some further study of that matter can be made by the division of valuation. The accounts of carriers have not been kept in such a way that

figures bearing upon this subject can be obtained without an analysis of the details. Just what or how reliable information could be worked up is uncertain but if the commission is of the opinion that some figure should be established in respect to this item the matter might well be re-committed to the division of valuation with instructions to investigate and report to the commission.

DEPRECIATION

The carriers claim that there is no depreciation so long as the property is maintained in a state of 100 per cent efficiency. The duty of the commission is, as they see it, to inquire whether there be deferred maintenance, and, if so, to report that; otherwise it should report no depreciation. This certainly is not true of a single simple unit of railroad property. Take, for example, a rail. This has a life depending upon the conditions of use and maintenance. Let it be assumed that the life of the rail under consideration is 10 years. At the end of the first year this rail carries the same load with the same safety as when new. It is at 100 per cent efficiency. Nevertheless one-tenth of its life has gone. At the end of five years it is still at 100 per cent efficiency but one-half its life has gone. No definition of depreciation has ever been formulated under which it could be said that this rail does not depreciate as its useful life expires.

It is conceded by the Government that a public utility has a right to demand from the public in the way of earnings an amount sufficient to cover depreciation. Will it be conceded by the public utilities of this country that nothing need be allowed for the wear of the rail or the ties? Certainly it will not be and ought not to be.

It is true that in case of a composite property like a railroad, made up of different units of various kinds with a life of varying lengths, there comes a time when renewals will offset depreciation, so that if the property is properly maintained it does not depreciate as a whole below that point.

That this is so appears from the fact that the total depreciation in case of an old railroad may be even less than in case of a much newer one. The per cent of depreciation in the highly maintained Pennsylvania line, which is 50 years old, may be less than that in some newly constructed line which is not 10 years old. This is a fact of great significance which may play an important part when it comes to devising some proper way in which to state depreciation and determine a proper depreciation allowance. It does not support the claim that there is no depreciation until a falling off in efficiency occurs.

The contention of the carriers is that to depreciate their properties and to make the depreciated value the basis for rate making is virtually to confiscate those properties by this amount; but if this be so it is because the carrier has not in the past earned, as it should, an amount sufficient to cover depreciation. A railroad should earn from the day it begins operation an amount sufficient to pay its operating expenses, the depreciation of its property, and a fair return upon that property invested for the public benefit. If it has earned that amount and if its property has depreciated 15 per cent, then it has somewhere in some form the amount of this depreciation, and the depreciation itself ought to be charged against it. It may be that in the majority of cases the railroad did not earn in its early years and could not have earned under reasonable rates a sufficient amount to take care of this depreciation; but this does not show that the depreciation itself does not occur.

The act requires the commission to show in detail, with respect to each piece of property, the cost of reproduction less depreciation. This is exactly what the division of valuation is attempting to do. No attempt has been made to depreciate each tie or each rail, but the ties upon a valua-

tion section are regarded as one piece of property, so of the rails, other track material, etc. Each building of considerable size is depreciated as a unit, and the same thing is true of shop machines, of engines, and of cars. It is inconceivable that the commission will seriously entertain the proposition of the carrier to find no depreciation unless there be deferred maintenance.

The commission uses what is known as the "straight-line" method; that is, it assumes that the total service units are equally distributed over the entire life of an article. Some suggestion has been made by counsel that this method was unjust to the carrier and ought not to be employed. No testimony has been introduced in support of this proposition. The commission is without information as to what other method might be employed or as to how it could be applied.

The straight-line method has been used generally, if not uniformly, in valuation proceedings where depreciation was shown. That was the method employed in the cases which went to the Supreme Court of the United States. It would seem to be fair to all parties, since it expresses the exact condition of the property.

CONTINGENCIES

In most estimates of the cost of reproduction in the past an allowance has been made in the nature of an overhead charge for contingencies. This has generally been computed as a percentage and has varied from 2 to 10 per cent. Some times the same percentage has been computed upon both road and equipment accounts, while in other cases a larger percentage has been used for the road accounts than for equipment. No allowance has been made for contingencies, as such, by the commission in the tentative valuation of the Texas Midland and this is alleged as error.

When the building of a railroad is in contemplation the engineer locates his railroad, ascertains what facts he can as to physical and commercial conditions under which that railroad is to be built, makes his surveys, draws his plans, and from these surveys and plans determines the quantities which will enter into the construction of the road. He then applies to those quantities what he believes to be a proper price, and thereby shows the total expense of building the railroad.

The accuracy of this estimate will depend upon the character of the man who makes it and the care with which it is made; but even though the engineer be competent and the work done with care, it is still found necessary by experience to add to the estimate from 5 to 10 per cent for contingencies to cover matters which have not been foreseen. No question can be made that the prudent engineer and the prudent investor will do this and that experience demonstrates the practical necessity for such an addition. But what are the reasons for this allowance and do those reasons apply in case of a reproductive estimate?

There are perhaps two general classes of items which justify the allowance for contingencies in case of the road to be constructed. It is almost inevitable that some things will be forgotten which are finally necessary to the completion of the property. If a complete detail of the construction expense as actually incurred be compared with the detailed estimate, it will be found that certain items in the former do not appear in the latter. These omitted items make up a considerable part of the allowance for contingencies.

In the building of the railroad unexpected difficulties are encountered. The character of the excavation is not what was anticipated. Rock is found where earth might have been expected. Bridge piers must be given a greater depth of penetration than was indicated by the borings and soundings. These and numerous other unforeseen conditions add to the total cost of the work.

Neither of these two classes of items which make up the greater part of the sum total of contingencies in new construction are present in the reproduction of the property. The road has been constructed. Every item which enters into the property is present and can be seen and inventoried. Those things which were omitted in the estimate of original construction are all here before the eye in case of the completed property. The first class of items which renders an allowance for contingencies imperative in case of new construction disappears in case of reproduction.

It may be said, although that claim has not been very clearly urged in testimony by the carriers, that it is impossible to enumerate all the items of property which enter into the construction of a railroad and that some allowance must be made to take care of inevitable omissions. While this might be so in case of an inventory hastily taken, it is not true of the inventory which is being made in this valuation.

It should be further noted that certain matters which might be termed contingencies are taken care of in the price. This is illustrated by the building accounts. In determining the reproductive cost of a building a bill of materials is prepared and prices are applied. To this an addition is made on account of contingencies or contractor's profit or both. This is to cover that element of uncertainty which exists in every estimate. The result is the outside figure for which the building could be built by the carrier or for which it could be contracted to a responsible contractor if that method were preferred. Certainly nothing further should be added to the cost thus determined on account of contingencies.

In some of the primary accounts there is no contingency. This would be so of rail. It would be true of ties if properly handled and cared for. Wherever there is a liability to loss an allowance is made on this account. In the laying of rail, for instance, a certain number of spikes will be lost. The carrier to produce a mile of track must purchase more spikes than will be found in the completed track. An allowance is made on this account, the quantity of spikes actually found being increased sufficiently to cover the quantity which must as a practical matter be purchased. The same sort of an allowance is made in other cases where necessary. It has been felt that much more accurate results can be reached in this way than by a general allowance based on an analogy which does not exist to cover something the amount of which can only be guessed at.

ENGINEERING

In determining cost of reproduction it has been the general practice to allow a gross sum for engineering in the nature of an overhead expense. It is claimed that this is not correct. The Kansas commission in its protest against the tentative value of the Kansas City Southern insists that engineering ought not to be included in one general item but should be assigned to particular pieces of property, and the first inquiry is, What practice should be followed in this respect?

The conclusion was reached after the most careful consideration with the engineers of the commission that to attempt to allocate the cost of engineering to particular pieces of property would be a refinement not practiced in the past, not called for in the present work, and which for lack of supporting data would introduce an element of greater uncertainty rather than greater certainty. It was therefore determined to adopt the almost universal practice of the past and to treat engineering as an overhead charge which could be properly stated in a single gross amount.

For the determination of this amount two methods are open, the synthetical and the historical. Under the synthetical method an attempt is made to determine the amount of engineering service which will be required and its cost.

A construction program is mapped out; the number of engineers required is determined; their grade and salaries are fixed; the length of their service is stated; and in this way the total amount of the expenditure is arrived at. This method was actually tried by the division of valuation in case of all the properties first valued with the result that we became convinced that it was neither satisfactory nor safe. The objection is that no supporting data can be found. Reliance must be placed entirely upon the judgment of the man who makes the estimate. It is not possible to bring that judgment to the test of actual experience as disclosed by the records of the carriers.

The historical method inquires what this expense has been in the past and seeks to determine in this manner what it would be today. For years engineering has stood as primary account No. 1. It is one of the few accounts which have never been changed. It has been easy to distinguish those items which should go to this account. The actual cost of engineering is therefore known with substantial accuracy as to many railroad properties.

Assuming that engineering is to be computed as a percentage, upon what base should it be reckoned? Should the entire cost of the property be taken or should the percentage be applied to certain items of cost?

The investment accounts of a railroad are divided into three general classes, road, equipment, and general expenditures. It is evident that there is no connection and therefore no necessary relation between engineering and general expenditures. This class of accounts should therefore be omitted in computing engineering.

In some cases engineering accrues as an expense in connection with equipment and in others it does not. With smaller roads and with many of the larger roads equipment engineering is furnished by the builder and becomes a part of the price paid for the completed article. It often happens, however, that equipment is furnished according to specifications prepared by the carrier and this involves an item of engineering expense. Considered as a whole, the proportion of engineering cost assignable to equipment is almost negligible.

Now, the relation between the cost of equipment and the cost of roadway varies greatly with different properties. The New Orleans, Texas & Mexico, for example, shows a reproductive cost of its roadway of approximately \$4,407,868 and of equipment of approximately \$3,997,808, while in case of the Winston-Salem Southbound the reproductive cost of its roadway is \$4,493,137 and of its equipment \$292,165. It will be seen, therefore, that there is no definite relation between the cost of engineering and the cost of equipment and therefore equipment should be disregarded in seeking a satisfactory base for the computing of engineering as a percentage.

This would leave the road accounts only and from these engineering itself should be excluded. The same is also true of land in connection with which there is little or no engineering proper. Whatever might go into that account is more properly chargeable to the cost of the land.

It would seem, therefore, that the road accounts exclusive of land and engineering afford the most reliable base for the computation of engineering as a percentage.

For the purpose of ascertaining whether engineering could properly be stated as a percentage of the above road accounts a study was early begun by the division of valuation, the results of which were exhibited to the commission by its supervisor of accounts. The property of 70 different corporations was covered. One hundred and twenty-one different projects ranging from 2½ to 900 miles in length were involved. The total number of miles of railroad construction was 9,617, the cost of which was \$302,000,000.

These projects were selected by the supervisor of accounts by taking first those properties upon which the accountants

of the commission were then engaged, and next selecting certain other properties which were pointed out by our engineers in the various districts as probably instructive. No one knew when the property was selected what the figures would show. No attempt was made to support any preconceived theory, the sole desire being to ascertain the fact, and it is believed that the result is fairly reliable. Our stock of information is being added to day by day and the sum total may somewhat change the present result, but not much.

An examination of the figures given by Mr. Brown shows that in 6 cases the per cent of engineering exceeds 6 per cent; in 10 cases it is between 5 and 6 per cent; in 4 cases it is below 1 per cent; and in 16 cases between 1 and 2 per cent. An examination of the chart introduced in connection with Mr. Brown's testimony, upon which the percentages are graphically shown, demonstrates that the great bulk falls between 2 and 5 per cent. Mr. Brown testified that a weighted average showed approximately 3.6 per cent.

The deduction from the study of the division of valuation is confirmed by the studies of the carriers, and the information accumulated by them. Mr. Hansel is chairman of a committee appointed by the president's conference committee for the purpose of dealing with the subject of engineering. He had before him while giving his testimony a compilation of data furnished him by the carriers from all parts of the country. Those figures given by the carriers themselves, and therefore not unduly low, showed an average of 4.4 per cent as stated by Mr. Hansel. It is not believed that the returns from which Mr. Hansel testified are as representative as those of the commission, for while they cover a greater mileage they only embrace 38 different corporations as compared with 70 in the compilation of the division of valuation.

Acting upon the strength of what our own studies disclosed the Washington office issued to members of the engineering board an instruction to allow for engineering a percentage of the road and track accounts, exclusive of land and engineering, which should be not less than 2 per cent nor more than 5 per cent under ordinary circumstances. If the member of the engineering board believes that there are peculiar circumstances which justify the applying of a percentage either above or below the limits thus fixed he calls the case to the attention of the Washington office, giving his opinion and his reasons in support of the same. It is then determined upon conference what percentage shall be allowed. It is believed that this is the fairest—indeed the only possible—way in which engineering can be treated in a valuation upon the scale of this one, and where it is required that the valuation shall be distributed between the several States, and it is further believed that the figures fixed are not open to serious question.

Assuming that the above rule is correct, how shall it be applied to a particular property? How shall the engineer determine whether 2 per cent or 5 per cent is the proper figure to allow?

Plainly, he must inquire as to the character of the road and the amount of engineering required. If the road is of extremely simple construction and the expenditure is ordinary in amount, the percentage would be low, while if the difficulties are many it would be high, although it should be noted that some of the most difficult projects show a comparatively low percentage of engineering cost, for the reason that the total cost upon which the percentage is reckoned is large. For example, the Florida East Coast extension from Homestead to Key West involves unusual engineering difficulties, and yet the percentage of engineering is but 2.52 per cent.

GENERAL EXPENDITURES

The best examination we have been able to give the matter indicates that 1½ per cent would be about right for the

average case, but this is computed upon all the road accounts except land. In some States a large charter fee is required, depending usually upon the amount of the capital stock and bonds named in the articles of incorporation. Our engineers are instructed to ascertain the amount of such fee and to add it to the $1\frac{1}{2}$ per cent where it is more than nominal.

It was felt at the outset that it might be necessary to determine in each case the cost of obtaining money; that is, that inquiry must be made into the credit of the company and the circumstances which would surround its financing. Further reflection, however, showed that this would be an almost impossible task and that the result would be misleading rather than informing. On the whole it seemed best to assume that the credit of all companies whose property was being reproduced was good and the same; that they could all obtain money at the same rate and purchase supplies for the same price. Upon no other theory would the cost of reproducing the different properties be fairly comparable.

This being settled the next question was, what rate of interest should be adopted? Six per cent is the legal rate of interest in a large section of this country where no other rate is specified. An examination of the sale of bonds of various kinds for the five years preceding June 30, 1914, led to the belief that this rate would be ample to cover not only the interest on the money but any brokerage which would usually be charged for the obtaining of the money. It has been assumed, therefore, that at 6 per cent whatever money is needed can be obtained and that this rate of interest will cover the entire cost of obtaining the money.

CONSTRUCTION PERIOD

The only importance of the construction period is in its bearing upon interest during construction and to an extent perhaps upon certain other overhead charges like engineering and general expenditures. While there can be no serious question as to this period in case of the Texas Midland, there will be a wide difference of opinion in many, and perhaps in most cases. The length of the construction period will be one of the debatable questions which will run into money more rapidly than almost any other and what is meant by it should be clearly defined.

With respect to the determination of the length of the construction period two observations may be made.

(1) An examination of the construction history of many railroads shows that construction has seldom proceeded as rapidly as it might economically have done. Delays have been due to a great variety of causes but oftenest to financial difficulties. For this reason the period of construction as it has actually existed in case of particular properties is not a fair measure of what the construction period for those properties should be, nor is the average construction period a fair test. The construction period as determined by our engineers is not supposed to represent the shortest period in which the railroad could be constructed but rather that period within which the work might be economically done. The usual delays which occur on the average in normal times due to labor and market conditions are assumed to exist, but unusual delays due to financial troubles and to other causes peculiar to individual properties are eliminated.

(2) All existing means of transportation aside from the property itself which is under reproduction are assumed to exist. The Texas Midland, for example, is crossed by several different roads, which makes possible the bringing in of men and materials at these junction points. This enables the engineer to proceed with his hypothetical reconstruction at several different places at the same time. Assuming that conditions are the same along the entire line a road 300 miles in extent might be reproduced in nearly the same time as a road 100 miles long.

INTEREST DURING CONSTRUCTION

It has already been stated in discussing cost of securing money that 6 per cent had been fixed upon as the rate of interest which should be allowed; it remains to consider the length of time for which this rate should be applied. In the valuation of public utilities like a railroad it has been customary in the past to allow interest for one-half the construction period. This is apparently done upon the theory that expenditures would run over the entire period of construction at about the same rate. Following this practice the division of valuation at first determined that interest should be reckoned upon the entire reproductive cost for one-half the full construction period.

The equipment of a railroad very often makes up a considerable part of its entire cost. This is not usually purchased for the most part until the road is practically completed and but little if any interest is actually paid on expenditures on this account up to the time that operation begins. For this reason it did not seem proper to treat the payments for equipment exactly the same as payments for other items of construction. It was finally decided to allow in most cases interest upon equipment for three months.

Interest was computed upon the above basis in case of the Texas Midland. In reckoning interest the entire construction period was used and interest was computed for nine months upon all accounts except land and interest.

My own opinion is still what it has been from the first. It is hardly conceivable that a railroad would be built without having provision in cash for on the average at least three months' expenditures. In addition, it must be remembered that no interest is allowed on expenditures during the preliminary period until the end of that period or until actual construction has begun. A deposit averaging that amount would undoubtedly carry with it some small allowance on account of interest from the bank, and 6 per cent is perhaps more than the average railroad has paid; but remembering that this covers not only interest on the money but the expense of obtaining the money it seems to me that the rule, while certainly a liberal one, is perhaps none too liberal.

LANDS

Some of the most important and at the same time the most doubtful and difficult questions presented arise under lands. No attempt is here made to discuss the legal phases of these questions, but simply to consider what should be done from an administrative standpoint.

Paragraph *First* of the valuation act requires the commission to report original cost, cost of reproduction new, and the cost of reproduction less depreciation of each piece of property owned or used by a common carrier for its purposes as a common carrier. If this paragraph stood alone, it would clearly impose upon the commission the duty of reporting the cost of reproducing the operative lands of the carrier.

Paragraph *Second* enumerates in detail the things which are to be reported as to the operative lands of the carrier. It is a maxim of statutory construction that a general provision may be modified by a particular provision in the same statute, and when these two paragraphs are considered together it seems evident that all the facts as to which Congress desired a report touching the right of way of the carrier are enumerated in Paragraph *Second*. If this is so, the commission is not required to report in terms the cost to the carrier of acquiring at the present day its common-carrier lands.

This, however, is not of much practical importance since paragraph *second*, as ordinarily interpreted, requires the commission to report, if not the cost of reproduction, at least what amounts to the same thing. Paragraph *second*,

which may for convenience be repeated here, is as follows:

Second. Such investigation and report shall state in detail and separately from improvements the original cost of all lands, rights of way, and terminals owned or used for the purposes of a common carrier, and ascertained as of the time of dedication to public use, and the present value of the same, and separately the original and present cost of condemnation and damages or of purchase in excess of such original cost or present value.

Every effort is being made both by the carrier and by the commission to ascertain and report the original cost of lands. The carrier is required to make return showing such cost in detail and this return when received is carefully examined and verified by the accountants of the commission. The records of the carrier, municipal land records, court records, and any and every source of information which tends to show what the carrier did actually pay for its right of way are consulted.

When it is impossible to ascertain what the carrier did in fact pay no attempt has been made to estimate the value of the lands acquired at the time of their original acquisition. Certain lands of the Texas Midland were donated and an attempt was made to ascertain the value of these lands at the time of the donation. About 20 years had elapsed. It was found exceedingly difficult to obtain reliable information and it was felt that the result did not justify the effort; since then no similar attempt has been made unless it was possible to reach a fairly reliable conclusion.

Our accountants attempt to classify this original cost; that is, to show how much was paid the landowner and whether as a purchase price or as condemnation damages, the cost of taking and recording the title, the fees paid lawyers, land agents, etc. These classified costs are assigned so far as possible to specific parcels. In a word, all the information available upon the subject of original cost is being compiled and reported in as much detail as would be profitable.

The commission has reported in the tentative valuation of the Texas Midland and in all other tentative valuations to date a present value which is arrived at by ascertaining the number of acres of land owned or used by the carrier for its purposes as a common carrier and multiplying this acreage by a market value determined from the present market value of similar adjacent and adjoining lands. Due allowance is made for any peculiar value which may attach by reason of the peculiar adaptability of the land to railroad use. Nothing is included for the expense of acquisition, nor for severance damages, nor for interest during construction.

I have myself doubted whether this was in all cases the *present value* called for by the statute. It is the market value by the acre of the lands taken; what an entire tract of such land would sell for; it is not the present value of the right of way of the carrier if that is to be determined either by what it would ordinarily cost the carrier to acquire a piece of that peculiar shape and for that use, or by the lessening of value to the entire tract of the land owner.

The purpose of the valuation act seems to have been to require from the commission a report of all those facts needed to establish the value upon which a carrier is entitled to earn. In this view it is said to be well enough to report acreage value as present value, since original cost is also reported, and if original cost is to govern, the tribunal which fixes the ultimate value can use the proper figure.

It has seemed to me that under the decision of the *Minnesota Rate case* some further investigation should be made where the original cost exceeds the acreage value and that after such investigation a present value should be determined which might or might not, according to circumstances, be the original cost or some figure differing from that. The original cost would be merely an item of evidence bearing upon present value.

No attempt has been made to show the cost of originally procuring right of way in excess of then acreage value and none should be made for the reason that it can not be shown with sufficient accuracy to be of service. To attempt to go back more than 10 to 15 years and to state the acreage value of the lands of the carrier at the time of their appropriation would be to enter the realm of speculation. Any conclusion reached would be little better than a guess. Congress certainly does not intend to require what is practically impossible. If this is to be attempted at all it could probably best be done by applying a percentage or multiplier as hereinafter indicated.

No attempt has so far been made to show the cost of procuring right of way at present time in excess of acreage value for the following reasons: (a) The meaning of the statute is extremely uncertain. (b) The *Minnesota rate case*, decided after the passage of the valuation act, has upset many theories as to the valuation of railway lands and thereby rendered unimportant facts which were previously considered to be significant. If this provision be construed as requiring the commission to show the cost of acquiring the lands of a carrier at the present time in addition to the acreage value of the land itself, then that decision has apparently rendered this work unnecessary.

Carriers insist that such is the meaning of this provision and have given evidence tending to show that it is possible to ascertain and report the fact. It is claimed that each parcel should be considered by itself, that the acreage value of the land taken should be determined, and that it should be further determined what the damages to such parcels are in addition to such land value. This is the question submitted in every condemnation proceeding and to adopt this course of action would mean that a condemnation proceeding should be instituted as to every individual parcel. I have made myself and have caused to be made by others some estimate of the expense of determining these values in that way, and the general opinion is that a conservative estimate would be from \$2,000,000 to \$4,000,000 in addition to the land work which we are now doing. My own belief is that it would be considerably more than this sum if we were to include the subsequent expenses of litigation after the tentative report of the commission had been published.

The carriers seem to assume that the commission would be satisfied to accept the showing which they might make but this can not be done. If this fact is to be determined it must be determined by the representatives of the commission. Today we have no rules or methods for the handling of this matter nor are many of our land appraisers competent to handle it. If this thing is to be done a new method of procedure must be marked out, new rules must be formulated, and a new corps of employees must be drilled.

When all this has been done and a result has been obtained, what supporting data can be marshaled to sustain it? Absolutely nothing except the opinion of some man. This is not at all so of the present land values which we are obtaining. Back of these values are opinions and assessments and of more importance than all else actual sales. It is becoming evident that the acreage values which the commission fixes either in country or in city can not be successfully attacked. The commission may publish these with some assurance that they will stand the test of the most rigid investigation. Not so with these severance damages which will have nothing but a mere opinion founded on no intelligent experience behind them.

I have never contended myself that it was impossible to report this fact. This is the issue in every condemnation case. Upon that issue witnesses are called and a conclusion is finally reached. It can hardly be said that the commission could not investigate and report its conclusion. My

thought has been that the commission was not justified in throwing away millions of money to establish a fact which the Supreme Court of the United States has held since the passage of the act to be of no account when ascertained.

If the commission is of the opinion that the act does require it to report this fact, and that this requirement of the act should be complied with before calling to the attention of Congress the decision of the Supreme Court, this can probably be done by another method, which will produce a more accurate result and will not involve much effort or expense.

It is generally understood that a railroad must pay for its right of way something more than the acreage value of the land which it takes. It has been the general impression that the value of the right of way of a railroad was determined by the cost of acquiring that right of way at the time in question under the then land values. Therefore in order to determine the value of its right of way it has been necessary to first determine this excess which the railroad must pay over and above the acreage value.

For this purpose studies have been made by State commissions and others. The actual expenditure by a railroad for its right of way in a particular case is known. The acreage value of the land acquired can be determined with substantial accuracy in just the way that our people are determining that fact today. The difference between the amount actually paid by the railroad and this acreage value represents the excess cost.

The result of these studies has usually been stated in the form of a percentage or multiple; that is, the excess cost would be as much as the acreage cost, or it might be one-half as much or twice as much. In any event it was stated in terms of a percentage of the land cost and was ordinarily known as a multiple.

If any attempt is to be made to show cost of procuring right of way, it should be done in this manner. The result would be more reliable, it would cost but little, and when once determined would leave less room for dispute and subsequent litigation.

Below is a statement of my own opinion as to what the commission should report touching the operative lands of a common carrier:

1. It should ascertain and report the acreage value. This is the basic fact upon which all other facts must depend. Whatever else is done this is the first and principal thing. The division of valuation has felt that if this fact could be accurately ascertained anything else which needed to be done or could be done would involve comparatively little effort. Up to the present time this is practically all which the land section has attempted to do.

2. This value is being reported as the present value called for by the statute, but I doubt whether this is correct. In some cases, and perhaps in most cases, the acreage value and the present value are the same, but there are instances in which this is not true. In my own opinion it would be better to report an acreage value and also a present value.

Should this be done the acreage value would be the present value in all cases where original cost, including the expense of acquisition and adding a reasonable amount for interest during construction did not exceed such acreage value. If original cost did exceed the acreage value, then some further investigation should be made. If the value of these lands had not declined since the date of their acquisition, if they were acquired with reasonable prudence, and if no unusual or abnormal condition appeared, then original cost would be stated as present value, not because original cost is present value, but because under the circumstances it would be the best evidence of such reasonable value.

3. If the commission believes that it should report cost

of acquisition at the present time, that should be stated as a percentage of the acreage value. Such percentage should be determined for each carrier and there would be no objection to giving the amount in dollars produced by the percentage.

OTHER VALUES AND ELEMENTS OF VALUE

The commission is required to investigate and report other values and elements of value, if any. Before the making of a tentative valuation upon the Texas Midland a communication was addressed to that carrier stating that it might file with the division of valuation, if it desired, a statement of the particulars in which it claimed an allowance of this character. In reply that company did file such statement, claiming an allowance on account of the following items:

- (a) Going concern value.
- (b) Connection with other lines.
- (c) Good station facilities.
- (d) Gradients.

No testimony was introduced in support of its claim by the carrier and the commission stated in the tentative valuation that upon the record thus presented it was unable to find that the carrier was entitled to any allowance on account of other values and elements of value.

It follows that since the commission is not finding an ultimate value there should be no attempt to state at this time in dollars the other values or elements of value which might be considered in the determination of a final value of this property.

NEW PENNSYLVANIA ELECTRIC LOCOMOTIVE HAULS ITS FIRST TRAIN

An electric locomotive, which was built at the Altoona shops of the Pennsylvania Railroad for use in hauling heavy trains on the Horseshoe Curve and over the Allegheny Mountains, when the main line between Altoona and Conemaugh is electrified, was given its first trial trip on August 24.

The test was conducted on the electrified portion of the main line between Overbrook and Paoli. The freight train.



The New Locomotive Under Test on the Paoli Electrification of the Pennsylvania.

which was drawn by the electric locomotive, consisted of an idle steam locomotive, 68 loaded freight cars and a cabin car. Similar tests were conducted for several days.

The new locomotive, known as class FFI, is provided with four motors and has an hourly rating of 4,800 horsepower. It can be operated in either direction, and was designed to give great power at low speed. The locomotive

measures 76 ft. 6¼ in. over-all, and has a wheel base 63 ft. 11 in. long. The driving wheels are 6 ft. in diameter. The total weight of the engine is 240 tons and the effective weight on drives is 198 tons. It is designed to operate from an 11,000 volt, single-phase overhead contact wire, taking current by means of a pantograph similar to that used on the suburban electric motor car trains in service between Philadelphia and Paoli. A detailed description of this locomotive was given on page 1199 of the *Railway Age Gazette* for June 8, 1917. The cab, frame, trucks and other mechanical parts were built by the railroad at the Altoona shops; the electrical equipment was supplied by the Westinghouse Electric & Manufacturing Company of East Pittsburgh.

The locomotive was built with the idea of developing a standard type for handling tonnage trains electrically over the grade west of Altoona, Pa., known as the Altoona Hill. This hill includes 24 miles of 1 per cent, and 12 miles of 2 per cent grade, and contains the famous Horseshoe Curve. Although the trial electric locomotive has been built and is being tested, the actual work of electrifying the section of main line referred to has not yet been authorized.

WASHINGTON CORRESPONDENCE

WASHINGTON, D. C., October 3, 1917.

NEWLANDS COMMITTEE CONSIDERING WESTERN TRIP

The Newlands Joint Committee on Interstate Commerce, whose inquiry into questions pertaining to railway regulation and control and government ownership has been subjected to so many vicissitudes, is giving consideration to a plan for resuming its activities during the brief interval between the prospective adjournment of the special war session of Congress and the opening of the regular session in December. While it is understood that nothing definite has yet been decided the leaders in the committee are planning a trip to the Pacific Coast for the purpose of holding hearings in San Francisco, possibly at other western cities, and also in Chicago. Such a trip would hardly place the committee in a position to make even a partial report to Congress that would be worth while, because its investigation has been so interrupted that it has thus far been able to hear but little evidence beyond the preliminary testimony on behalf of the railroads; but many members of the committee are anxious to take advantage of the opportunity to hear from western shippers and others during the brief respite from legislative activity.

Under the resolution passed last winter extending the time for the committee's inquiry a report is required to be presented at the opening of the next session, but by an amendment to the urgent deficiency appropriation bill passed by the Senate last week, the committee is continued for another year and the time for reporting is extended until the first Monday in December, 1918. The bill was sent to conference on September 28.

The joint resolution authorizing a general inquiry into the subject of railroad regulation was passed in July, 1916, and hearings were expected to be held during the summer. At its first meeting the committee outlined a tentative itinerary for an extensive western trip but the Congressional session was so delayed by the threatened railroad strike and other matters that the hearings were not begun until November 20, continuing until December 9; and it became necessary to ask for the extension. Hearings were also held during March and May, but the declaration of war with Germany and the calling of the busy extra session now drawing to a close put further progress out of the question.

The new conditions created by the war and the concentration of the nation's energies on its prosecution are also considered to have made it inadvisable for the committee to attempt to make any final report this year.

WAR REVENUE BILL

The war revenue bill, designed to yield \$2,700,000,000 in revenue during the next year, after having been considerably revised in conference from the form in which it was originally passed in the House and from that in which it was passed by the Senate, was reported back to the House on Saturday and passed on Monday. It was passed by the Senate on Tuesday. The most important change in the provisions affecting the taxation of railroads was made in the war profits tax, for the purpose of allowing an exemption of from 7 to 9 per cent of the invested capital, as defined by the bill. The graduated scale of rates is also changed to range from 20 to 60 per cent of various percentages of the so-called excess profits. The House bill levied an excess profits tax in addition to the excess profits tax now upon the statute books of 8 per cent. of the average net income of corporations and partnerships in excess of 8 per cent of the capital actually invested and an additional exemption of \$5,000. The Senate substituted a war profits tax providing graduated rates ranging from 12 to 60 per cent upon incomes in excess of the average income during the years 1911, 1912 and 1913. The Senate provision, however, limited the exemption to an amount not less than 6 nor more than 10 per cent of the actual capital invested. The conferees on the part of the House receded from the disagreement to this amendment with an amendment levying an excess profits tax upon the excess profits ranging from 20 to 60 per cent. In arriving at the excess profits an exemption from the net income as shown by the income tax returns of not less than 7 nor more than 9 per cent of the actual capital invested is to be allowed. In addition, domestic corporations are allowed a flat exemption of \$3,000.

The bill still provides for an increase of the corporation income tax to a total of 6 per cent and also provides a tax of 10 per cent upon the amount of corporate income remaining undistributed six months after the end of each year, with an exemption of the amount actually invested and employed in the business or retained for the reasonable requirements of the business. One amendment adopted by the conferees provides that the normal tax of individuals on the income derive from interest from bonds containing a tax free covenant provision shall be deducted and withheld at the source of the income, providing that this shall not apply to the new 2 per cent normal tax until on and after January 1, 1918. The effect is to require the withholding of only 2 per cent on the income from the corporate bonds.

The compromise rates of the war tax are as follows:

20 per cent of the amount of the net incomes in excess of the deduction allowed and not in excess of 15 per cent of the invested capital for the taxable year.

25 per cent of the net income in excess of 15 per cent and not in excess of 20 per cent.

35 per cent of the net income in excess of 20 per cent and not in excess of 25 per cent.

45 per cent of the net income in excess of 25 per cent and not in excess of 33 per cent.

60 per cent of the net income in excess of 33 per cent.

The invested capital is defined as: (1) Actual cash paid in; (2) the actual cash value of tangible property paid in other than cash, for stock or shares at the time of such payment (but in case such tangible property was paid in prior to January 1, 1914, the actual cash value of such property as of January 1, 1914, but in no case to exceed the par value of the original stock or shares specifically issued therefor), and, (3) paid in or earned surplus and undivided profits used or employed in the business exclusive of undivided profits earned during the taxable year.

Several changes were also made in the proposed taxes on freight, express and passenger transportation. The tax on freight bills is left at 3 per cent. The House bill provided a tax on express of 6 per cent of the amount paid for the

transportation. The Senate amended this by proposing a tax of 1 cent for each 25 cents or fraction thereof. The compromise provides for a tax of 1 cent for each 20 cents or fraction thereof. The House bill provided a tax equivalent to 10 per cent of the amount paid for the transportation of persons by rail or water. The Senate reduced this to 5 per cent and the compromise amendment provides for 8 per cent. This applies to any form of mechanical motive power on a regularly established line in competition with carriers by rail or water. The House bill provided a tax equivalent to 10 per cent of the amount paid for seats, berths or state-rooms in parlor cars, sleeping cars or on vessels. The Senate reduced this to 5 per cent but the Senate conferees receded. The compromise amendment applying to transportation of railroad company material provides that the tax shall not apply to the transportation of company material transported by one carrier which constitutes a part of a railroad system for another carrier which is also part of the same system.

MOBILIZATION OF THE ARMY

Up to Wednesday of this week, at the time of the start of the third division of the new National Army for the training camp cantonments, the railroads had moved approximately 720,000 soldiers from their homes or quarters to training camps or embarkation points since early in August, including the regular army, the National Guard and the selective draft army. The total up to Saturday night, September 29, was 705,000. The great bulk of this army, according to a statement issued by the Railroads' War Board giving a general description of the part played by the railroads in handling the biggest troop movement ever attempted in this country, has required special train service, involving the use of 13,500 passenger cars, including 1,500 Pullman standard and tourist sleeping cars, 2,000 baggage cars and 4,500 freight cars. The part that did not require special train service was the 32,549 men included in the first 5 per cent of the National Army that moved by regular trains on September 5.

Approximately 40 per cent more, 275,000 men, were entrained from September 19 to 23 and 25 per cent more, or approximately 172,000, are included in the division to be entrained from October 3 to 7. It is expected that the balance of the citizen soldiers will begin to move to the cantonments beginning October 17 and there are some additional units of the National Guard to be taken care of.

The figures as to the percentages of the National Army to be moved on different dates as originally planned are somewhat larger than the number actually moved on those dates because of the fact that some of the cantonments were not quite ready to receive the complete quotas and because of the complications introduced by the plan of moving the colored men in separate trains. As a result the balance to be moved beginning October 17 will be somewhat larger than originally contemplated. This, however, is in no way the fault of the railroads as they have displayed a remarkable example of efficiency throughout the entire performance, which has progressed "with smoothness and success," according to a statement by Secretary of War Baker.

The troop movement problem has been a most difficult one to handle. Some conception of what it has meant may be deduced from the fact that in the National Army movement alone the railroads have had to prepare special schedules covering the 4,531 towns and cities designated by the Provost Marshal General as the points of local concentration from which the recruits proceed to their cantonments, and the special train movements have had to be so directed as to prevent interruption to the regular passenger service.

These schedules were prepared by the various territorial passenger associations and the extent of the work involved may be appreciated from the fact that in the office of the

Transcontinental Passenger Association, under the direction of Chairman E. L. Bevington, which had the longest hauls to arrange for, 75 clerks have been employed for several weeks on their preparation; and in the office of C. L. Hunter, vice-chairman of the Trunk Line Association, a force of 60 was employed. Of the local concentration points, those where the largest number of men were to start were designated as extra coach or special train points, while the men from the smaller towns started on regular trains. The points at which additional men were to be taken on the trains were all provided for in the schedules, as well as those at which extra coaches were to be added. At certain concentration points the extra coaches were made up into special trains to run through to the cantonments. All of these schedules were worked out well in advance, submitted to and approved by the War Department and then distributed to each of the local boards in charge of the entrainment. In many cases they were prepared sufficiently in advance to have them printed. The longest haul made in the new National army movement to date, according to the statement of the Railroads' War Board, was that of the special train which moved the citizen soldiers from Yuma, Arizona, to Fort Riley, Kansas, a distance of 1,514 miles. This trip occupied 48 hours.

The shortest distance traveled by any unit of the new National Army was that of the District of Columbia unit to Camp Meade in Maryland, a trip of less than 25 miles.

Practically all of the National Guard movements to date have been of great length. The longest one was that made by a battalion of San Francisco engineers from San Francisco, California, to a point on the Atlantic Coast. This battalion included 506 men and 18 officers. They occupied a special train comprising one standard sleeper, nine tourist sleepers, one baggage car, two kitchen cars and three box cars. Their train left San Francisco at 4 p. m. on September 1 and arrived at destination at 10:15 a. m. September 8.

The railroads have taken every step possible to safeguard the lives that the government has entrusted to them, and to complete the troop movement without delay and also without interfering with the abnormal amount of commercial traffic that the war has produced.

The railroads have experienced some difficulty in certain cases because of a lack of complete control by the military authorities over the drafted men en route and reports have been made of a number of specific instances of wanton damage to passenger cars by troops. This has been particularly noticeable in the case of some of the men from the Northwest. A report was received stating that a large number of the selected men who boarded a train in Montana were "crazy drunk" and not only seriously injured several of their own number in a scrimmage on the train, but murdered one train porter and threw another off the train while it was running 50 miles an hour. They also broke into a baggage car and took \$300 worth of food supplies. The railroads have taken up with the War Department the question of securing protection from incidents of this kind.

A bulletin issued on June 15 by the acting chief of staff of the army stated that the many complaints received and claims filed for damage to railroad equipment in recent movements of troops would indicate that commanding officers of troop trains are not complying with the field service regulations regarding the keeping of order on trains. One of these rules requires the commanding officers of each troop train to take such action as may be necessary to prevent railroad equipment from being defaced or injured in any way by his command and that he will particularly caution all concerned against throwing articles from cars, a serious accident having occurred from this cause. Where any damage or defacement is noted, a report is to be made through proper military channels to the adjutant general of the army and the railroad representative is to be given an acknowledgment. Railroad officers have been directed to arrange to have a joint inspection made at destination.



The Twenty-ninth Annual Meeting.

American Railway Accounting Officers Meeting

Universal Through Interline Waybilling, Accounting
for Government Business and Other Important Reports

THE twenty-ninth annual meeting of the Association of American Railway Accounting Officers was held at the Congress Hotel, Chicago, on September 26 and 27. Of the approximately 700 members of the association there were over 200 present. The meeting was a strictly business one; there were no entertainment features provided. Every effort was made to carry out the work of the association with all the speed consistent with a thorough consideration of the subjects discussed.

EXECUTIVE COMMITTEE

UNIVERSAL THROUGH INTERLINE WAYBILLING, THROUGH
RATES AND SIMPLIFIED DIVISIONS.

There exists at this time and probably will continue to exist for an indefinite period an urgent necessity for:

(a) The conservation and minimization of clerical man power.

(b) The conservation of revenues by reducing operating costs.

(c) The prompt and expeditious movement of freights.

(d) The continuous movement, without intermediate delays for rebilling of freights, of all freight cars moving under inter-road loads.

Local waybilling to and from intermediate junctions or inter-road freights, both car load and less car loads, act as a means of preventing the accomplishment of those necessities above referred to. Complicated divisions and the absences of inter-road rates act as a deterrent to the establishment of through interline waybilling and to the minimization of clerical costs incident thereto.

The Association of American Railway Accounting Officers, realizing all the benefits to be gained from such through interline waybilling has for years past strongly advocated its universal adoption with, thus far, but little substantial success. The difficulty would seem to be largely in its inability to forcefully interest the several freight traffic officers and traffic associations in its importance.

The association has through its standing Committee on Freight Accounts created a sub-committee, charged with the duty of meeting and conferring with the several freight traffic committees and associations for the purpose of impressing upon the members of such committees and associations the importance of the simplification of inter-road divisions and the establishment of through rates, to the

end that interline waybilling may be universally adopted.

While that sub-committee has been both progressive and aggressive in its work, it has apparently met with but lukewarm success, and but little, if any, substantial progress has thus far been made.

The needs herein stated are so pressing and the benefits to be derived from universal through interline waybilling are so apparent that this association deems it to be its duty not only to continue its present activities, through its freight committee, but to strengthen the hands of that committee and to bring the question to the attention of the chief executives of the railroad, and to those ends, be it:

Resolved: The president of this association be, and he is hereby directed to direct the standing freight committee to continue until otherwise directed, the sub-committee created by it to confer with freight traffic committees and associations urging the simplifications of inter-road divisions and the establishment of through rates to the end that the universal adoption of through interline waybilling may be made at once practicable as well as economical. Be it further

Resolved: The president of this association be, and he is hereby directed to appoint an associate committee, consisting of five chief accounting officers, to be territorially selected, whose duty it will be to act with and to as far as possible aid the sub-committee of the freight committee in accomplishing the ends sought by it to be accomplished; and be it further

Resolved: That the president of this association be, and he is hereby directed to, either direct or through the sub-committee on Military Transportation Accounting, bring these preambles and resolutions to the attention of the Special Committee on National Defense of the American Railway Association.

BILLS FOR CAR REPAIRS

The committee approved the recommendation that there be added to the accounting officers rules printed in the rule of the Master Car Builders' Association the following sentences: "All bills should be rendered promptly. Bills rendered after one year from date of repairs may be declined."

CHARGING HIGHER RATES ON FREIGHT SHIPPED "TO ORDER"

It was resolved that while the committee appreciates the question of additional expense and responsibility involved

in connection with "order notify" shipments the Association of American Railway Accounting Officers, not being a rate-making body, the matter does not come within its province.

MEMBERSHIP CHANGES

During the year the committee has admitted 77 new members to the association and on April 21, 1917, the association had 695 active members, representing 298,852 miles of railroad and certain express companies and water carriers. This is an increase of 52 active members as compared with April 21, 1916. The association has 69 honorary members.

CORPORATE, FISCAL AND GENERAL ACCOUNTS

A MINIMUM FOR ADDITION AND BETTERMENT CHARGES

The chairman of the committee is in receipt of a letter dated June 10, 1916, from Thomas W. Hulme, general secretary Presidents' Conference Committee, Philadelphia, Pa., reading:

As a member of the sub-committee conferring with the government on modification of Valuation Order No. 3 governing the reporting of additions and betterments and deletions, you have full knowledge of the recent suggestion of Director Frouty of the Division of Valuation that there should be a modification of the requirements of the Interstate Commerce Commission through their order of July last requiring the charging, as I understand it, to capital account of all expenditures, no matter how small, which are not properly chargeable to expense accounts. It seems to me that this matter is one that in the first instance should be dealt with by the Association of Accounting Officers and not by this organization on valuation. I understand there is to be a meeting of the standing committee on corporate, fiscal and general accounts on the 26th. I, therefore, recommend that the subject should receive their consideration and will thank you to advise me of developments in connection therewith.

I will mention this subject at the meeting of the presidents on the 16th instant, but will not ask them to take any action thereon.

That letter was presented to the committee by Chairman A. H. Plant with the following comments:

The members will recall that when the present classifications of road and equipment and of operating expenses were promulgated the railways were given the option of charging expenditures for additions and betterments for amounts less than \$200.00 to operating expenses. This privilege was optional.

Subsequently and apparently at the suggestion of the Division of Valuation the Interstate Commerce Commission withdrew this privilege and directed that all items of expenditures for additions and betterments, regardless of the amounts involved, be charged to the property accounts and not to operating expenses.

Confronted with the difficulties of recording additions and betterments under this revised rule and of reporting them to the Division of Valuation under order No. 3 of that division, the general secretary of the presidents' conference committee appointed a subcommittee consisting of two accounting officers and two engineers to confer with the representatives of the division of valuation looking to a modification of the reports to be made under valuation order No. 3. During the conference which was held by that subcommittee and the representatives of the division of valuation, it was suggested by the division of valuation that an order be issued under which the railways would be required to charge to and to report as operating expenses all expenditures for additions and betterments below an amount to be determined. Such a rule to be made mandatory.

The subcommittee for the railways was requested to give the matter consideration, to make a canvass of the railways, and to ascertain whether such an order would be feasible or not and also to advise the division of valuation what figure, in its opinion, should be used as a minimum.

The subcommittee for the railways, at a subsequent meeting with the division of valuation, stated that the matter was of such importance as to justify more careful and deliberate consideration and that it was not prepared at that time to make any recommendations in respect to it.

The matter being one both of policy and of accounting,

it was felt by the subcommittee and also by the general secretary that it should be referred to the members of the Standing Committee on Corporate, Fiscal and General Accounts for, first, the ascertainment of the views of their chief executives as to the policy features, and second, for a full discussion of the subject from an accounting standpoint.

After carefully considering the matter, the committee adopted the following resolution:

WHEREAS, The Division of Valuation, Interstate Commerce Commission, has suggested the issuance of an accounting order changing the present rules and under which any expenditures for improvements and extensions of existing property when the amount is below a minimum, to be established for that purpose, shall be charged to operating expenses and not to investment account; and

WHEREAS, While this committee recognizes that the rules, as they now stand, are probably in accordance with correct accounting, it also recognizes that the additional work required in carrying out those rules is so great as to cause an expense not warranted by the results; therefore be it

Resolved, That a change be made in the present rules so as to permit amounts within such minimum to be charged to investment or to operating expenses, at the option of the carrier.

DEPRECIATION OF EQUIPMENT

The committee is of the opinion that depreciation should be based on the ledger value of equipment as of the last day of the period preceding that for which depreciation is figured.

Fred W. Sweney, chief examiner of accounts of the Interstate Commerce Commission, wrote to the chairman of the committee asking whether or not it would be possible to make an assignment to private accounts of the investment in equipment prior to July 1, 1907, in order that accounting for depreciation on such equipment should be simplified. Mr. Sweney suggested that if an assignment on an actual basis cannot be made, estimates be employed. The committee, however, did not think it advisable to make the separation as suggested where this involved assigning an estimated value to equipment. Where the actual cost of the equipment standing in the property account can be determined the committee was of the opinion that the separation could be made.

OMITTING TREASURER'S NAME ON DRAFTS

By direction of President R. A. White, the following letter of May 16, 1916, from L. G. Scott, comptroller, Wabash Railway, was submitted for consideration by the committee:

I find that it is the practice of a large number of roads in making drafts for interline and per diem balances to show the name of the treasurer on the drafts. In order to do this it is necessary to refer to the Official and Equipment Guides to ascertain the name of the treasurer, and this takes a great deal of time.

In looking through the drafts drawn by foreign roads upon this company that were paid today, I find the following:

Forty drafts show name of the treasurer.

Twenty drafts drawn on the treasurer, without name of the treasurer being given (in some of these cases the word "treasurer" was printed on the draft).

Twenty-three drafts drawn on the Wabash Railway, St. Louis, without any reference to the treasurer.

It occurred to me that it might be well to bring this matter to the attention of the accounting officers members of the association, and the matter is referred to you to take whatever action you may consider desirable. If the practice of dropping the names of the treasurers was adopted by all of the carriers it would certainly eliminate an immense amount of work in making monthly drafts.

The committee is of the opinion that this is a matter for local determination and action by each individual line.

ACCOUNTING FOR REBUILT CARS

The committee recommends the adoption of the following resolutions:

Resolved, That this association approves the effort of the Special Committee for Conference with the M. C. B. Association to establish uniform rules for settlement between roads

for destroyed cars, and believes that where a car has been rebuilt, the settlement should be on the basis of a new car.

Further Resolved, That the determination of whether or not a car has been rebuilt should not depend upon the dollars spent but upon schedules of work done which this association hereby asks the special committee to recommend that the Master Car Builders' Association prepare.

Further Resolved, That this association recommend to the Division of Carriers' Accounts, Interstate Commerce Commission, that the existing rule for the retirement of an old unit and the substitution therefor of a rebuilt unit of equipment be amended so that the factor for determining the retirement shall be based upon physical changes reflected by the schedules recommended in the foregoing resolutions, rather than upon costs.

GENERAL BALANCE SHEET ACCOUNTS

The committee is of the opinion that the item in the general balance sheet "interest matured unpaid" should be omitted so that interest payable July 1 which is now included in that account would be included in "unmatured interest accrued."

CLASSIFIED STATEMENT OF EQUIPMENT

The committee is of the opinion that it is not necessary to make provision for a separate showing for work locomotives in schedule 414.

EQUALIZATION OF OPERATING EXPENSES

The following is a letter, dated March 27, 1917, from Fred W. Sweeney, chief examiner of accounts, Interstate Commerce Commission, addressed to Chairman A. H. Plant:

The returns submitted by carriers in response to accounting series circular No. 50, "Opening Reserve Accounts," indicate that all carriers do not uniformly interpret the provisions of section 19, "Equalization of Expenses," in the special instructions on page 37 of the classification of operating revenues and operating expenses of steam roads. It is provided that:

"For the purpose of equalizing the monthly charges for the repairs of fixed improvements and equipment the carrier may include each month in the appropriate primary repair accounts a uniform proportion of the amount of authorized estimates of such expenses for the fiscal or calendar year."

The question has been raised as to the construction to be placed on the phrase "uniform proportion," it having been pointed out that a uniform proportion is not necessarily an equal proportion.

For the purpose of developing the views of the committee and arriving at consistent treatment by all carriers employing operating reserves for the permissive equalization of operating expenses, the matter is submitted for the consideration of the committee so that if it is regarded as desirable an accounting case may be prepared which will clearly indicate the construction to be placed on the text in question.

The committee appointed the following subcommittee to confer with the commission's representatives on this matter and report to the committee: A. H. Plant, chairman; C. M. Bunting, C. B. Seger and G. R. Martin.

MODIFICATION OF REPORTS AND STATISTICS REQUIRED BY GOVERNMENT BODIES

The executive committee of the Special Committee on National Defense of the American Railway Association, recognizing the substantial decrease in clerical man power and clerical efficiency of the railroads occasioned by enlistments in the several branches of the government, the selective draft and other conditions brought about by the war on the one hand, and the multitude of accounting and statistical requirements imposed by governmental and supervisory bodies upon the railroads, and the abnormal conditions under which government men and materials will be transported during the war, requiring increased clerical efficiency over normal conditions to properly account, between the government and the railroads, for revenues earned under those conditions on the other hand, has under consideration an appeal to the several federal and state bodies to which the large volume of reports are now made by the railroads, for some relief from the burdens thus imposed.

As an initial step in that direction the chairman of the

committee was requested, by the executive committee referred to, to convene the Standing Committee on Corporate, Fiscal and General Accounts, for the purpose of making a careful study of the reports, statistics and accounting requirements of the several governmental bodies, with a view to making its recommendations as to the extent such requirements might be modified, as will be seen from the following minute of that executive committee:

"A. H. Plant appeared before the committee and was requested to convene the Committee on Corporate, Fiscal and General Accounts of the Association of American Railway Accounting Officers to consider a possible reduction in the Accounting system now required by the Interstate Commerce Commission and to make a preliminary report thereon. It was the feeling of the committee that when the preliminary report is received, consideration should be given to holding a conference concerning it with representatives of the Interstate Commerce Commission, and Clyde B. Aitchison, representing the state railroad commissions, before a formal report is made on behalf of the executive committee to the Interstate Commerce Commission."

Thereupon a meeting of the committee was held in Washington on Thursday, August 16. Twenty-two members of the committee, including the president of the association, attended the meeting, either in person, by representatives or by vesting in the committee authority to act for them.

The committee, after hearing fully the objects sought to be accomplished, decided that the best results could be obtained by referring the working out of the details to a subcommittee. This subcommittee, having associated with it, Dr. Lorenz and Mr. Sweeney of the Interstate Commerce Commission, after considering the matter in great detail, reached its final conclusions and made its report, which report was, by the Chairman of the committee, submitted to the executive committee of the Special Committee on National Defense of the American Railway Association on Wednesday, August 22, 1917. The report was, upon its presentation, taken into consideration of the committee, submitted to the executive committee taken by it to bring about the recommendations of the committee with respect to a joint conference between representatives of the Interstate Commerce Commission, the state commissions, and the railroads, looking to reaching final conclusions in the matter.

The corporate committee during its deliberation upon this subject, concluded that the matter could be more effectively handled through its subcommittee on Statistics and Accounts, with the addition of C. B. Seger. After reaching their conclusion, it delegated the handling of the entire question to that subcommittee with full power to act and to carry the matter to a final conclusion.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS
Standing Committee on Corporate, Fiscal and General Accounts
Office of the Chairman, 1300 Pennsylvania Avenue, N. W.

WASHINGTON, D. C., August 22, 1917.
To the Executive Committee of the Special Committee on National Defense of the American Railway Association, Fairfax Harrison, Chairman:
Sir—In the matter of Docket A-127:

Complying with a minute of your committee promulgated August 9, 1917, requesting that the standing committee on corporate, fiscal and general accounts of the Association of American Railway Accounting Officers be convened for the purpose of considering a possible reduction in the accounting systems and reports required of the railroads by governmental bodies, you are advised that the accounting committee convened, gave due and careful consideration to the matter submitted to it by you, and presents herewith its report.

(1) The annual report required of class 1 railroads by the Interstate Commerce Commission includes approximately 100 separate schedules or statements, which may be divided into the following general classes, i. e.,

- (a) Historical,
- (b) Corporate and Fiscal,
- (c) Operations,
- (d) Statistical, including special studies.

Each of the schedules was carefully considered by the committee, due consideration being given to the retention of data relating to the corporate, financial and operating results of railroads. The committee's conclusions with respect to that report are that some of the schedules can be eliminated, others modified and still others consolidated with other schedules without impairing the value of the report.

The modifications suggested, if adopted by both federal and state com-

misions, would result in substantial savings in man power and would materially aid the railroads in meeting abnormal accounting and physical conditions brought about by the war.

The committee's recommendations in detail are contained in Exhibit "A," which is made a part of this report.

(2) Practically all of the states require annual reports similar to those required by the federal commission with, however, more or less applications and elaborations. Many of the states require separations of results of operations as between those within and without the state, and further separations of results as between interstate and intrastate operations. Still others require allocations to show separately operating costs applicable to passenger service and to freight service of both state and interstate business.

You will, of course, appreciate that the several states generally follow the federal commission in their annual report requirements, therefore the full measure of relief sought by the railroads cannot be obtained unless the several states will modify their requirements in line with such concessions as may be made by the federal commission. It is the hope of the committee that the state bodies will accept, without modification, copies of reports required by the federal commission.

The committee has reason to believe that the several states are in a receptive mood with respect to a general review and possible modification of the statistical data now required of railroads by them. This belief is predicated upon a report made by a committee on statistics and accounts of the National Association of Railway Commissioners submitted to and adopted by it at its annual meeting on November 13 and 17 of last year. An excerpt from such report is herewith submitted as Exhibit "B."

(3) Many of the schedules required by the annual reports and not a few of those required monthly and periodically call for statistics apparently for specific studies and for the information of statisticians and others who seek information for compilations to be prepared by them. In this connection attention is directed to schedule No. 320 in the annual report calling for a segregation of expenses between freight and passenger; this is covered by a specific order and classification of the commission, and such separation has been made since July 1, 1915. The statistics required in schedule 330 are experimental and have been kept for a sufficient time to afford the commission a basis for any study which they may desire to make. During the war period such reports will not reflect normal operating conditions. It is recommended that the order and amended classification be suspended during the period of the war, if not permanently.

The value or reliability of statistics made for comparative purposes, or for the purpose of determining unit costs is materially lessened when the factors from which they are produced are disturbed by abnormal conditions.

The conditions under which the railroads will be required to handle traffic during the period of the war will have a marked effect upon such factors, thus, in the opinion of the committee, destroy their usefulness.

(4) Many demands are made upon carriers by the Division of Valuation for statistical data. The reports required by it, in addition to the engineering and field work, are numerous and require large forces for their compilation.

As an illustration, under the terms of Order No. 3, recently issued, carriers are required to report in detail units, quantities and prices of practically all additions and betterments work done by them since the time of valuation. Careful consideration results in the conclusion that the burdens placed upon carriers by the terms of this division could be substantially reduced, and every requirement of the division could be met if the order were modified so that carriers would report only the total cost of each project and be required to record and retain as matters of record in their offices the basic data the details of which, with respect to each project, would be at all times available to the commission.

In addition to the federal requirements many states having completed individual valuations require of railroads monthly and periodical reports of additions and betterments. The recommendations made with respect to the Federal Valuation Order No. 3 applies with equal force to the requirements of the states. A copy of Valuation Order No. 3 is attached and marked tabular "C."

It should be understood that the data required by Order No. 3 is not limited to the period of valuation, but it is continuous for all time; therefore, the burden imposed by a compliance with it will not cease with the completion of the valuation work.

(5) The information called for by schedule No. 561, employees and their compensation, in the annual report, was compiled originally in accordance with suggestions made by the American Railway Association. It is a costly schedule to produce, and it is recommended that it be reviewed by the proper committee with a view to its modification.

(6) The committee understands that a sub-committee of the American Railway Association now has under consideration recommendations looking to the simplification of the form of accident report required from carriers to be filed with the federal commission. Railroads representing something like 204,000 miles made 153,000 accident reports during the year 1915.

(7) As to boiler inspection and other operating reports, your committee recommends that the possible simplification of these reports be studied by other committees having to do with the details of such reports. During the year 1915 the railroads made approximately 2,174,000 boiler and boiler inspection reports.

(8) In addition to the requirements which may be classed as "accounting," many and varied other reports are required by regulating bodies, some monthly, others periodically, such as reports of shop operations required by the Census Bureau; reports of various classes of traffic required by the Agricultural Department, etc. Efforts should be made to reduce the number of such reports.

(9) A compilation made by the Bureau of Railway Economics, Exhibit "D" attached, shows that during the year 1915 (the latest data available), railroads representing approximately 204,000 miles of road were required to compile approximately 1,876,000 original reports to governmental and other supervising bodies, many of which were required in duplicate. These reports vary from a monthly report, by stations, of the number of cars of milk shipped from each station, to the complete annual report required by the federal commission, which report is required in duplicate.

(10) Enlistments, the selective draft, and demands made upon the railroads by governmental and industrial bodies for experienced clerks, have materially handicapped the railroads in producing records and data necessary

to maintain the integrity of their accounts and in properly safeguarding and accounting for revenues earned by them. This condition is increasing, and will continue to increase during the period of the war. On many railroads, offices heretofore adequately and capably equipped clerically, are now confronted with depleted forces, or are, to a large extent, dependent upon new and inexperienced clerks.

(11) The data necessary to the compilation of all the reports required originate largely in line, agency and divisional offices. The data thus originated is passed along through the various channels until it reaches the department charged with the duty of compiling and reporting it; therefore, it may be reasonably assumed that practically every department on the railroad has a clerical as well as supervisory duty to perform in one way or another in preparing or accumulating data necessary in the preparation of these reports.

In order to properly meet demands which will be made upon them because of war conditions, the railroads will be taxed to their maximum capacity in meeting physical conditions incident to and necessary in the movement of men and materials, and in handling their commercial traffic. This condition, coupled with depleted forces by reason of conditions noted in paragraph 10, will make it very difficult, if not quite impossible, for the railroads to prepare in its line and general offices a large volume of the data now required by governmental bodies.

(12) It is the opinion of the corporate committee that to produce any appreciable results in the saving and conservation of man power by the reduction of reports, statistics and other data now required by governmental and supervising bodies, it will be necessary to give careful and thorough consideration to the various reports now required from railroads. This can only be done through concerted action on the part of

- (a) Representatives of the federal commission;
- (b) Representatives of the state commissions; and
- (c) Representatives of the railroads.

It is recommended for your consideration that a joint meeting of the three interests be held at an early date for the purpose of going into the entire matter in detail and reaching a mutual understanding as to what modifications, eliminations, consolidations and simplifications can be made in the entire schedule of reports now required from railroads, and the committee recommends that such action be taken.

The committee awaits your further pleasure.

Respectfully submitted, A. H. PLANT, Chairman.

NATIONAL ASSOCIATION OF RAILWAY COMMISSIONERS

The following is an excerpt from a report of the Committee on Statistics and Accounts of Railroad Companies of the National Association of Railway Commissioners, submitted as a part of the report of the Committee on Corporate, Fiscal and General Accounts:

"There have been brought to the attention of this committee the results of an inquiry made by the Bureau of Railway Economics regarding reports required to be filed with federal and state authorities by carriers by steam railway. From a preliminary study of the returns it appears that during the year ended June 30, 1915, the number of reports filed by the larger carriers, representing slightly less than 205,000 miles of operated road, aggregated 1,876,208. Some of these were required to be filed in duplicate and the number of duplicates was 1,115,570, making a grand total of 2,991,778. Of the number of originals, 1,565,042 were filed with federal authorities and 299,551 were filed with state authorities, while 11,615 were filed with local authorities. Some of these reports consisted of but a single sheet, while others were relatively large. Some were largely composed of matter which the carriers would record for their own purposes, while others contained little or no matter of value to the carriers. In view of the number of reports, it seems advisable to examine critically, at proper intervals, the list of reports required and to eliminate those no longer useful.

"In connection with the matter of reports required to be filed by carriers, your committee respectfully suggests that it would be well for the various commissions represented in the association to secure wherever necessary greater latitude for administrative discretion in the matter of requiring reports to be filed in certain cases. Many of the smaller carriers state that they find the provisions of the laws requiring reports in numerous cases to be burdensome, and while your committee does not wish to underrate the importance of ample and accurate records with respect to the efficiency of operation of even small carriers, it is satisfied that the necessity for certain reports is less in the cases of small carriers. Carriers in the Interstate Commerce Commission's Class III, those earning less than \$100,000 per annum, while amounting to more than 48 per cent of the total number of operating carriers by steam railway, exclusive of switching and

terminal companies, report operations on less than 3½ per cent of the operated *road* mileage, and less than 2½ per cent of the operated *track* mileage, and their revenues were less than one-half of 1 per cent of the total for the country. If the matter of the character and number of reports to be required of this class of carriers were left to the discretion of the respective commissions, unnecessary burdens upon these small companies might be lessened without sacrificing any public interest. It is not suggested that commissions should not have full authority to inspect books and other records of such corporations and to require the institution and maintenance of such records as the administration of the law by such commissions may show to be necessary, but it is the view of your committee that the determination of such records and the details of the reports to be required of such corporations should be left to the respective commissions, rather than be fixed by statute. The statute should, so far as practicable, prescribe only the controlling principles, leaving the details to be worked out by the commissions."

The report was signed by A. H. Plant, comptroller of the Southern Railway, as chairman, and was approved by the association

INTERLINE CARD WAYBILLS

Interline card waybills have been used by carriers to a limited extent in certain restricted territories to facilitate the movement of freight for which regular revenue waybills cannot be prepared in time to accompany the freight from the shipping point. They were adopted originally upon the recommendation of the Association of Transportation and Car Accounting Officers with the understanding that they would eliminate delays and congestion at junctions and terminal stations. Their use was quite general some years ago, but as they were found to be unsatisfactory, and encouraged delay in the preparation of revenue waybills, many carriers refused to accept freight from connecting carriers unless accompanied by revenue waybills, with the result that they are not now used extensively.

The principal argument advanced for the use of the interline card waybill is that it expedites the movement of freight. This argument has force as applied only to the movement of freight out of the point of origin and any slight delay at the point of origin occasioned by having the revenue waybill accompany the freight is more than offset by the expedited movement through the junction points and the prompt delivery at destination. At the point of origin by proper co-operation between the shippers and the railroads, the revenue waybill can and should be made to accompany every carload shipment. It is the sense of this association that the use of interline card waybills for carload shipments should be discontinued entirely and that they shall be used for L.C.I. shipments only upon authority of the accounting officers of the carriers interested.

Interline card waybills for L.C.I. shipments should be checked by the destination carriers against the revenue waybills, and if revenue waybills are not received within twenty-four hours after arrival of the freight, the waybills carrier should be requested to furnish revenue waybills.

A. A. R. A. O. standard form 111, interline card waybill, should be used when specifically authorized upon conditions mentioned in paragraph No. 92.

PROTECTION OF DESTINATION WEIGHTS

It is the fundamental principle underlying the association rules and practices that the destination road is charged with assessing the correct transportation charges. This principle is seldom questioned in connection with weights when we are dealing with interline waybills. When, however, we come to weights on rebilled shipments, some roads want to depart from this principle and dictate to the destination road what weights and what proof of weights shall be used, and

this notwithstanding that if the very same shipment were moving on a through interline waybill, the whole question would probably be left entirely to the destination road. In the opinion of the committee, this exception in regard to rebilled shipments is altogether illogical and places an unjust and irksome burden on the destination road, by requiring it to defend its weights and to produce weight certificates and other proof of weights that would not be required if the very same shipment had moved on an interline waybill. In the opinion of the committee this anomaly should be removed, and to that purpose the committee recommends the adoption of the following, which, in principle, is in accord with the rules of the Freight Claim Association:

Destination Weights on Rebilled Shipments. Initial and intermediate carriers shall accept the weights that are used by the destination carrier in assessing freight charges on rebilled shipments, and shall not require the destination carrier to substantiate the weights so used by weight certificate or otherwise.

QUALITY OF PAPER WAYBILLS

It has been observed by freight accounting officers that some roads are printing waybills on paper so thin and flimsy as to cause trouble to every one who deals with them. These waybills are so limp that they are hard to assort and bind, and crumple to a degree that makes them hard to read. By reason of their lack of toughness, important words and figures are frequently torn off. This is a false economy when all railroads are considered.

It is, therefore, strongly recommended that all waybill blanks be printed on paper of adequate weight and toughness.

ILLEGIBLE FREIGHT BILLS

The synopsis of 1916, in paragraphs 162 to 169, clearly sets forth the proper method of preparing waybills; the Standard Freight Bill Association No. 123, gives all data necessary for the proper preparation of this document.

Agents have been cautioned through circulars and letters to be careful in the preparation of waybills, transfer billing and freight bills, but the committee is of the opinion that the only way to prevent complaints is a systematic check of waybills against shipping orders, and of transfer bills and freight bills against waybills, with a view to eliminating any errors or omissions made in transcribing.

Errors and omissions are not entirely chargeable to agents and their forces. The shippers can render valuable assistance by preparing bills of lading and shipping orders with more care, and should not turn these documents—forming the foundation on which the waybills are built up—over to the agents, unless they are convinced that all the information necessary to render a perfect and satisfactory waybill is shown thereon, and that all the various documents furnished with the shipping order are legible, distinct, and, above all, that no abbreviations of any kind are used.

This action was taken by the committee on a complaint made by the National Industrial Traffic League to the Interstate Commerce Commission.

COMBINATION OF LOCAL RATES

Inasmuch as government freight is moving in large quantities, and, under the present emergency, must be moved promptly, it is very important that all carriers adopt and follow a definite, uniform plan of rendering accounts and making settlements among themselves in connection therewith.

Therefore, the recommendations contained in the 1916 Freight Synopsis, paragraphs 119 to 129, inclusive, are hereby reaffirmed, with the further recommendation:

That separate abstracts, division statements, and summaries be rendered in the settlement of transportation charges on government property; that the destination carrier

report currently tonnage and revenue and divide the revenue among the carriers interested. The abstracts, division statements, and summaries may be stamped "Government accounts—not subject to draft until the charges are collected," it being understood that the collecting carrier will notify the interested carriers promptly when amounts are collected, so that drafts can be drawn.

The Sub-committee on Military Transportation Accounting of the Special Committee on National Defense is now creating a Government Transportation Accounting Bureau in Washington, through which it is proposed, in conjunction with the depot quartermaster at Washington, to prepare and settle the accounts covering freight and passenger transportation for the government. The committee is informed that under the proposed arrangement prompt settlements of transportation accounts may be expected by carriers and that delays similar to those heretofore experienced will be avoided under the proposed plan of the Sub-committee on Military Transportation Accounting.

The report of the committee, which was signed by W. W. Strickland, freight auditor of the Atchison, Topeka & Santa Fe, as chairman, was approved by the association.

PASSENGER ACCOUNTS

OVERCOLLECTION ON TICKET SALES

The committee is of the opinion that overcharges on passenger tickets amounting to \$1 or less on any one ticket should be handled in the same manner as indicated in case 202; that is, carried in the passenger revenue accounts until refunded.

REDEEMED AND EXCHANGED TICKETS

The committee submitted the following questions to the twenty-one carriers represented on the committee:

1. What tickets are reported *with* revenue?
2. What tickets are reported *without* revenue?
3. How are agents' accounts cleared for those tickets reported with revenue and exchanged for other than cash?

The replies received show the practices of such carriers to be as follows:

	Reported by agents	
	With value	Without value
Tickets sold for cash.....	21	None
Tickets issued on Government or State request.....	13	8
Tickets issued on prepaid orders.....	12	9
Tickets issued on exchange orders.....	13	8
Tickets issued on those exchanged for other tickets.....	11	10

Three carriers reply that *all* tickets issued by agents whether receiving cash for same or not are reported by them with revenue, one more carrier replying that they are contemplating adopting same system.

Where tickets are reported by agents with revenue without receiving actual cash for same, their accounts are cleared by a majority of the carriers through a suspense account. Two replies indicate that they consider such an account unnecessary.

PATTERN OF PUNCH FOR LIMITING TICKETS

Resolved. That the association recommends the use of punches provided with L or O (circle) dies for indicating limits and classes on interline tickets, and also for indicating routes and destinations on multi-route tickets, but that the association would recommend that the O (circle) die be used in preference to the L punch.

SETTLEMENTS FOR GOVERNMENT TRANSPORTATION

This association reaffirms its previous action in the matter of reporting out tickets issued on government orders, as shown in the Passenger Synopsis, except that during the existing war it will be permissible for carriers to render a separate report of tickets stamped "Government account—not subject to draft until charges are collected," with the understanding that the collecting carriers will notify the

interested carriers promptly so that drafts can be drawn.

Where tickets issued on government orders are included in the regular reports, separate sheets should be used for such items, marked "Government," in order that these may be readily distinguished from the regular ticket sales.

A. J. GILLINGHAM

It comes to our attention that Mr. A. J. Gillingham, assistant to comptroller, Pennsylvania Railroad, will, on August 31, 1917, retire from railway service, and will resign as an active member of the Association of American Railway Accounting Officers, and the standing committee on Passenger Accounts.

It seems appropriate that the committee should pause and express its regret at parting with such an able, enthusiastic worker, and wish for him a happiness that comes from a life well spent. The committee acknowledges its indebtedness, in ungrudging measure, to Mr. Gillingham for his long, faithful and helpful service on this committee. His enthusiasm has been contagious. He has given his time freely for its welfare, and the work of the committee will bear his impress for all time to come. He has always had the interests of the committee at heart.

Mr. Gillingham is a man of forceful, convincing, pleasing personality—a good companion, a worth-while friend. After all, the friendships we make constitute the best part of life, and we have been fortunate indeed in having Mr. Gillingham for a friend, companion and fellow-worker.

The report of the committee was signed by W. F. Van Bergen, auditor of passenger accounts, Chicago & North Western, as chairman, and was approved by the association.

DISBURSEMENT ACCOUNTS

RECLAMATION OF SECOND-HAND MATERIAL

The terms "Second-hand Material" and "Reclaimed Material" are frequently used in a somewhat confusing manner and in order that there may be no misunderstanding as to the use of the terms the committee would define "Second-hand Material" as such material as has been released from use in such condition as that it may be applied again without repair or other process of manufacture.

"Reclaimed Material" is material picked up or acquired during the usual process of repairs and renewals, or as the result of obsolescence, which by a process of manufacture has been made usable in some form.

Accounts should be kept to which should be charged, at its scrap value, all material when placed in process of reclamation. To these accounts should also be charged the cost of all labor and material used in the process of reclamation, together with a proportion of shop and store expenses.

Reclaimed material should be charged to stock accounts at its cost as determined by the method outlined in the preceding paragraph.

CAR REPAIR BILLS

The subject referred to the committee naturally divides itself into two sections, viz.:

(a) The extent to which the accounting department should be responsible for correct accounting in connection with car repair bills and vouchers, and

(b) Whether it is the best practice to do as much of the accounting work as may be possible in the audit office or have it done by the mechanical department, the audit office merely to verify the calculations.

Taking up the first (a) proposition, the committee reports as follows:

The accounting department should supervise and be responsible for correct accounting in all departments; therefore, should assume responsibility for the correct preparation of car repair bills and for the proper checking and vouchering of such bills received from foreign lines.

With respect to the second (b) proposition, the committee reports that:

Based on the experience of roads which have adopted the plan of handling this work in the accounting department, and as a result of consideration of the subject, the committee is of the opinion that it is the best practice and the best results are obtained by handling this work in the accounting department. The following reasons suggest why the work can be more efficiently handled in the accounting department than in the mechanical department.

(a) The car department is organized, equipped and trained to give its first attention to the making of the repairs in order to get the cars back into service and necessarily is not likely to attach the same importance to recording and accounting for the repairs made as does the accounting department.

(b) The accounting department is composed of men who are trained to do all classes of accounting work. The accountant is not wedded to any particular branch of the service, but is taught to look out for the interests of all. He appreciates the relative value of small things and understands the necessity of looking out for them in an effort to stop all leakage in the matter of accounting for revenues and expenses. So far as matters of accounts and accounting are concerned, his training along analytical lines enables him to make investigations more thorough and complete than would be possible by a man not so trained. By concentrating all accounting work in connection with the preparation of car repair bills and vouchers in the accounting department, the carrier is assured of a uniform interpretation of the M. C. B. rules as they may apply to repair cards turned in from all repair points, by men who are qualified to interpret these rules correctly, and of the prompt preparation of bills and vouchers according to the most practical and scientific methods, resulting in bills and vouchers being taken into proper month's accounts. To these advantages may be added the additional advantage of having bills presented more promptly for collections; less danger of bills becoming lost in transit from mechanical department to accounting department; usually more convenient accessibility to the car accountant's records which have to be consulted frequently, etc.

RAIL REQUIREMENTS

Where rail requirements are made involving the substitution of lighter second-hand rail for heavier rail released, the credit to road and equipment shall be based on the difference between the weight of the rail laid and that released at current prices of the rail laid.

STORING IRON AND STEEL

The committee is of the opinion that the expense of unloading, reloading and storing iron and steel articles for export should be handled through the regular station accounts and the revenue should be divided between storage—freight and miscellaneous. The report was signed by A. Hermany, auditor of disbursements, Chicago, Rock Island & Pacific, as chairman and was approved by the association.

COMMITTEE FOR CONFERENCE WITH THE FREIGHT CLAIM ASSOCIATION

COLLECTION OF DEFICITS

When shipments are refused or unclaimed at destination, and freight and accessorial charges are not collectible from consignee by reason of non-assumption of ownership, such deficit may be charged to the initial carrier. The initial carrier shall be required to make necessary legal effort to collect from shipper. In the event that initial carrier is unable to collect after proper legal effort, the deficit shall be proratable. The above shall not apply when shipments are otherwise provided for by tariff.

HANDLING ASTRAY FREIGHT

After further consideration of this matter, the committee recommends that astray freight should be forwarded to marked destination on a distinctive form of astray freight waybill, but that no freight charges should be shown thereon by billing agent.

The report was signed by C. E. Hildum, auditor of freight accounts of the Erie, as chairman, and was approved by the association.

COMMITTEE FOR CONFERENCE WITH THE MASTER CAR BUILDERS' ASSOCIATION

A subject brought to our attention was that in connection with bills rendered by various companies against each other. It appears that in Rule 91 of the M. C. B. Association there are certain rules which are referred to as being those of the Association of American Railway Accounting Officers, but such rules do not specify any time after which bills would not be considered and the attention of the committee was directed to bills rendered by one company against another covering repairs made over ten years previously and the M. C. B. Association requested that we include in our rules the following:

"All bills should be rendered promptly. Bills rendered after one year from date of repairs may be declined."

Under the circumstances the committee felt that the request was a reasonable one and accordingly wrote Mr. Robinson, the president of our association, requesting that the matter be brought before the executive committee of our association at its meeting February 12 and 13, 1917. This was done and the executive committee approved our action and under date of February 19, 1917, Joseph W. Taylor, secretary of the Master Car Builders' Association, was advised accordingly.

The other matter and the one for which this committee was primarily appointed was the question of a check on car repair bills, which was fully discussed between the three committees named. It developed that at a meeting of the American Railway Association held sometime previously, that association had appropriated not to exceed \$3,000.00 a month to defray expenses of an investigation to be conducted by the Master Car Builders' Association, that association to employ ten men for the purpose of conducting the investigation.

The Master Car Builders' Association were agreeable to have the committee appoint five representatives and their committee appoint five for the purpose of making the investigation. This has been done and at the present time the secretary of the M. C. B. Association is endeavoring to secure from the various railroads of the country such credentials as will enable the ten representatives to make whatever investigation is finally decided upon should be made. We have not as yet agreed upon a method of procedure, but as soon as the secretary of the M. C. B. Association is in possession of all credentials, the matter will be agreed upon promptly and it is hoped that the investigation will be started at an early date.

The report was signed by M. P. Blauvelt, until recently comptroller of the Illinois Central, as chairman and was approved by the association.

PRESIDENT'S ADDRESS

When elected president of the association, I accepted the great honor with many misgivings, one being on account of my inability to deliver an address. It is, therefore, probably fortunate for the members present, as it certainly is for me, that this meeting was called for business purposes only, and that the change in the order of business, which is effective for the first time this year, has so placed the time for delivering the president's address that about all the business of the association he had to talk about has been fully cov-

ered in the reports of the committees and the discussion of the same. So my remarks must necessarily be brief.

War conditions have made necessary some changes in the practices governing the accounting between carriers for government business carried, as have been covered by the reports of the standing freight and passenger committees.

The synopses covering the recommendations of the association, now in effect, the issuance of which was authorized at this meeting, will, in my opinion, be of very great interest and benefit to the members.

I think the railroads are to be congratulated that this association does not intend to discontinue the fight it has so unsuccessfully waged in the past for through tariffs with simplified divisions and through billing arrangements, as is indicated by their action today. I feel certain that if, as suggested by Mr. Plant, the matter is brought to its attention, we can safely figure on assistance from the Special Committee on National Defense.

In his address at the Detroit meeting, President White stated that the "question of the change of the fiscal year had been carried to the court of final resort." That court has given a verdict in favor of the plaintiff and, knowing as I do the important part that Mr. White and those working with him had in the accomplishment of this result, they are entitled to the thanks of the association.

My attention has been called to the fact that changes have been made, from time to time, in some sections of the constitution and by-laws which are not in perfect harmony with the provisions of other sections; and, yesterday, your attention was called to the fact that the rules for both active and honorary membership qualifications have not always been uniformly construed by the executive committee, with the result that in some years applicants have been elected, while in others, those with like qualifications have been rejected.

I think you will agree that the rules governing the conduct of the association should be made so plain that they cannot be misunderstood, and especially, that the rules regarding membership qualifications should be so worded that "honor can be given where honor is due," which I do not think is always possible as they now read; and I therefore would recommend that the president be instructed to appoint a special committee of at least three (of which he will be one and, possibly, the vice-presidents the other two) to carefully revise the constitution and by-laws so as to meet conditions partly outlined above, reporting its recommendations direct to the association.

The conditions mentioned in paragraph 10 of the report of the standing committee on Corporate, Fiscal and General Accounts to the executive committee of the Special Committee on National Defense, in reference to the scarcity of clerical help, as given on page 11 of the Supplemental Agenda, is becoming very serious, as it is getting more and more difficult to retain the services of experienced clerks even at the increased wages railway companies are able to offer. As vacancies occur they have to be filled with inexperienced male clerks and by the employment of a larger proportion of women than has heretofore been thought practicable—all of this in face of increased demands on the accounting departments for information made necessary by the unusual conditions. While in the past the question of economy has not been overlooked, it has been (experienced help being plentiful) considered from a financial angle, but now we are compelled to consider it from, to most of us, an entirely new angle. It would, therefore, seem that this requires a special study not only into the methods of accounting, the reports required and the possibility of the elimination of those features not absolutely necessary for safeguarding the revenues of the company, but, also, as to the practicability of installing additional mechanical ap-

pliances that will accomplish a saving in labor with, or without, a saving in expense.

As many of the practices now being followed and forms now in use were, in the interest of uniformity, recommended by the association, it would seem that the association could be of great assistance to the railroads in this matter, and I would, therefore, recommend that the president be authorized to appoint a special committee for the purpose of making this study. Or, if that is not thought advisable, that he be authorized to delegate the appropriate standing committees on commerce in either case for early consideration, their recommendations to be submitted to the president for printing and distribution to the members of the association.

As will be noticed from the reports, the work of the different committees has broadened in the effort that has been and is being made to make the association of the utmost benefit to its members. The reports submitted include the largest number of subjects that has ever come before the association, and I wish to extend my thanks to the committees for the promptness with which they have handled the matters that have been brought to their attention and the consideration given to any suggestions that I have made.

In conclusion, it is probably unnecessary for me to say that the work of the secretary has been performed in his usual efficient manner, and has been more than satisfactory. It will be noticed from his report that, with twenty-five retirements, the membership of the association has been increased by fifty-two during the year, with an increase of over seven-thousand miles of railroad represented. The finances of the association are in first-class shape.

RESOLUTIONS

The following resolutions were adopted by the association:

Resolved, That the president and the two vice-presidents shall constitute a Special Committee on the Revision of the Constitution and By-Laws, whose report shall be submitted for action at the next annual meeting of the association.

Further resolved, That this resolution, as provided in Article XII of the constitution, is notice of amendment and revision.

Resolved, That the president appoint a special committee of five to prepare recommendations as to how accounting officers may best meet conditions confronting them with respect to clerical labor and the compilation of accounting and statistical data, particularly with respect to the use of mechanical devices as a means of solving the shortage in experienced clerical labor. The recommendation of this special committee shall be submitted to the president and distributed to all members as early as possible.

A paper was read by W. H. Williams, vice-president of the Delaware & Hudson and chairman of the board of directors of the Wabash, on Financing Modern Warfare.

St. Louis was fixed as the place for the next meeting of the association.

ELECTION OF OFFICERS

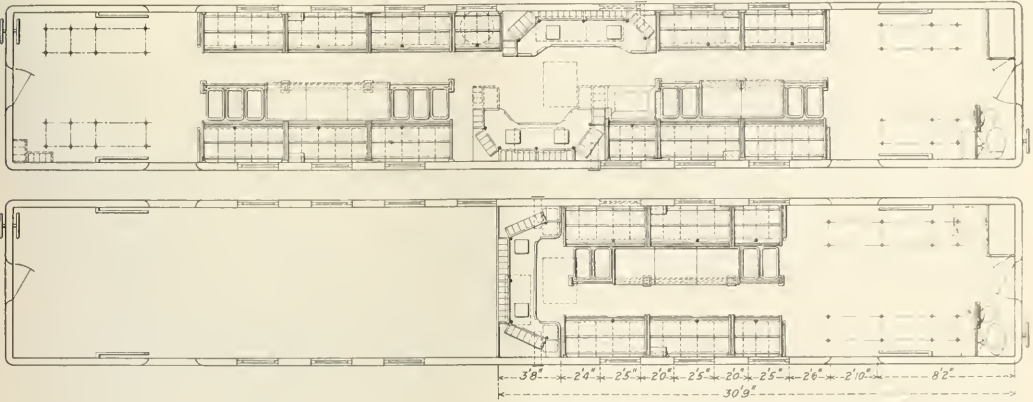
J. A. Taylor, comptroller of the Central of New Jersey and vice-president of the association, was elected president, succeeding L. A. Robinson, comptroller of the Chicago & North Western. R. E. Berger, assistant auditor of the Wabash and second vice-president of the association, was elected first vice-president, succeeding Mr. Taylor. A. D. McDonald, vice-president and comptroller of the Southern Pacific, was elected second vice-president, succeeding Mr. Berger. The following were elected members of the executive committee to succeed four retiring members of the committee: J. J. Elkin, general auditor of the Baltimore & Ohio; W. D. Beymer, comptroller of the Central of Georgia; H. A. Gray, comptroller of the Northern Pacific, and L. G. Scott, comptroller of the Wabash.

NEW FLOOR PLANS FOR POSTAL CARS

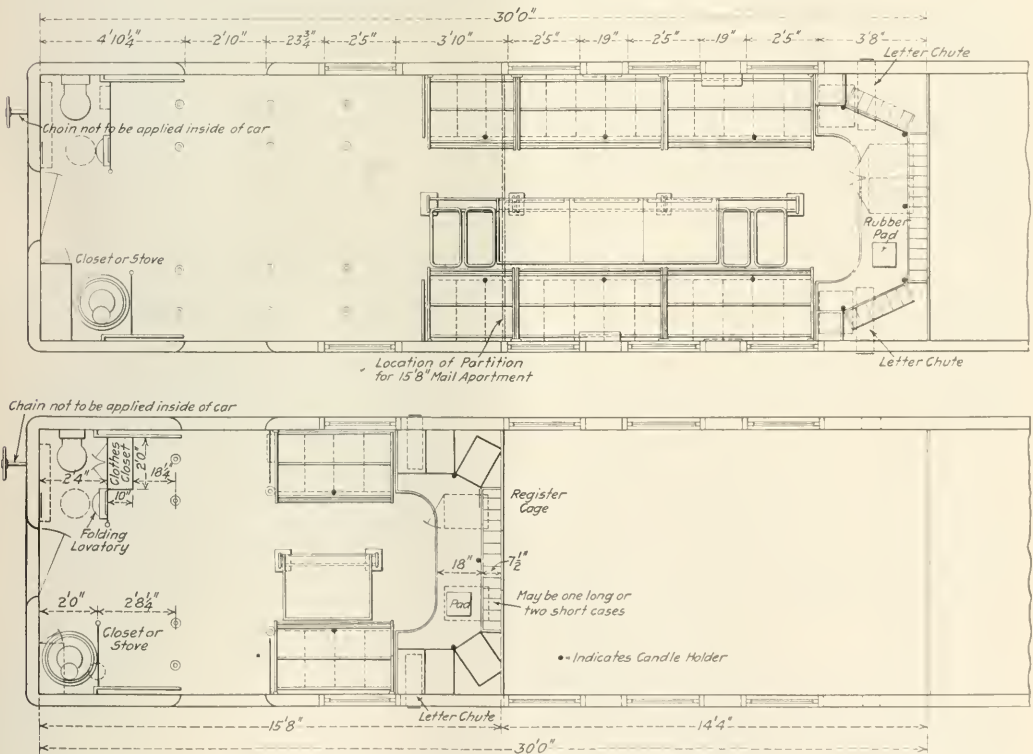
A modification of plans for the construction of postal cars has been approved and issued as an optional standard by the Division of Railway Mail Service of the Post Office

necessary to increase or decrease the space devoted to handling mail. The cost of maintaining postal cars conforming to the requirements of the Post Office Department should be materially lessened by this arrangement.

The new plans consist of minor modifications of existing



Plans for Converting the 60-ft. Mail Car to the 30-ft. Compartment



New Optional Floor Plans for 15-ft. and 30-ft. Floor Plans

Department. The changes have been made with a view to providing designs that can be easily converted from one standard length to another when service conditions make it

standards which will make it possible to convert a 60-ft. postal car into a 30-ft. apartment car, or change a 30-ft. apartment car into one having a 15-ft. apartment. In case

it is desired to return to the original arrangement it can be done at slight expense. These changes have been made possible by making the location of the doors and windows common to either size car.

The Post Office Department points out in connection with these plans that the work of transforming from one length to another may be greatly facilitated by making the interior equipment more nearly portable than is customary at present. Screws and bolts may be used for securing fixtures which are now permanently attached to the car body. It is also suggested that roads building 60-ft. postal cars which may at some future time be changed to 30-ft. apartment cars, may make it easy to change one end of the cars into a baggage compartment by framing the side doorways at one end for the company's standard baggage door-opening and filling in with false work to reduce the door openings to 2 ft. 10 in., the standard for postal cars.

Complete plans for the 15-ft.-30-ft. mail apartment are shown on Railway Mail Service drawing sheet M, while the plans for the 60-ft. mail car convertible to a 30-ft. apartment are shown on sheet N.

THE RESULTS OF CO-OPERATION

Reports just compiled for the Railroads' War Board indicate that the traveling public in general and the shippers in particular are giving the finest kind of co-operation to the railroads in the handling of the increased traffic that the war has produced. What this co-operation means may be gleaned from these facts given in a statement issued by the board:

Since May 1 the railroads, aided by the loyalty and understanding of the public, have been able to reduce their passenger service by approximately 25,000,000 miles. This has released thousands of train crews and locomotives for use in the freight service and cleared thousands of miles of track, thereby facilitating the movement of coal, food products and supplies needed by the government.

In addition to the foregoing saving of equipment and trackage, the shippers, big and small, have rallied so splendidly to the slogan, "Make one car do the work of two," that a saving of close to half a million freight cars has been accomplished. This saving of freight cars has enabled the railroads to move approximately 25 per cent more freight since war was declared than during the same period last year.

Intensive loading and a general increase in the size of the "trade units" used by the various industries has rendered possible the saving of car space. Cotton, for instance, which was formerly moved in units of 50 bales, now moves only in units of 65 and 75. As there are 18,000,000 bales to be moved by rail each season, the increase in the trade unit in this one commodity alone has produced a saving of anywhere from 83,000 to 125,000 cars.

Sugar, on which the carload minimum from the South was formerly only 24,000 lb. per car, now moves only on a 60,000 lb. carload minimum.

The producers of manufactured food products, especially the canners, have also come to a realization of the value of intensive loading, and are now loading virtually all of their cars to capacity.

Coal, which has been loaded beyond the marked capacity on most lines since the beginning of the war, is also moving freely now, although labor trouble in some parts of the country is tending to counteract the efforts of the railroads to meet the abnormal demand for fuel. During the past month, the supply of cars on the "lake coal" lines has been increased 25 per cent and there has been some increase in the movement of bituminous coal to lake ports, but it has not been proportionate to the increased supply of cars, as labor trouble has tended to decrease the mine production.

Although excellent results have been achieved to date through the co-operation of the shippers, the travelling public and the railroads, it will be necessary for all concerned to exert renewed efforts, as the abnormal demands upon the railroads in the movement of both troops and supplies is constantly increasing, while the securing of new equipment is virtually impossible.

From now on, it is stated, 2,500 cars a day will be required by the government to move food and supplies to the men in training at the National Army, National Guard and other encampments, while the demand of the Allies for cars to carry export goods to the seaports will be practically doubled. All of this additional traffic must be moved by the railroads, although they have only 3 per cent more equipment than they had at this time last year.

RAILWAY REGIMENTS' TOBACCO FUND

A movement has been started to have the railway supply companies and railway supply men of the United States raise a "Railway Regiments' Tobacco Fund." As this statement implies the purpose is to raise a fund with which to buy tobacco for the members of the railway regiments which have been organized and which are yet to be organized for service in the war in France.

The movement was initiated by F. A. Poor, president of the P. & M. Company, Chicago. He took the matter up with S. M. Felton, president of the Chicago Great Western, who is director general of railways for the United States government. Mr. Felton in a recent letter to Mr. Poor said, "It is quite difficult to have any tobacco delivered directly to the regiments in bulk so we will have to use the parcel post, and my suggestion would be to send twelve 20-lb. packages to each regiment each week. I think each package should contain 15 lb. of Bull Durham with necessary cigarette papers and 5 lb. of pipe tobacco. I do not know if this is too much of a contract for you or not, but as your letter spoke of 'regiments' I am giving you the addresses of all nine."

In order to raise the necessary funds a committee has been organized composed of the following: F. A. Poor, president, P. & M. Company; chairman: R. P. Lamont, president, American Steel Foundries, George A. Post, president, Standard Coupler Company and of the Railway Business Association, E. H. Bell, president, the Railroad Supply Company, and of the Railway Appliances Association, J. M. Hopkins, president, Camel Company, A. C. Moore, vice-president, Safety Car Heating and Lighting Company, and Samuel O. Dunn, editor, *Railway Age Gazette*, secretary. A meeting of this committee was held at the Chicago Club in Chicago on Tuesday.

It will be noted that the amount of tobacco required fully to supply each regiment, will be 240 lb. a week, or, a total of 2,160 lb. for the nine regiments. It has been ascertained that this amount can be bought for \$1,080, and it is hoped to raise this amount. John Washburn, vice-president of the Continental & Commercial National Bank, of Chicago, has consented to act as treasurer of the fund.

PERUVIAN RAILROAD EXTENSIONS.—The Central Railway of Peru will be extended through Ayacucho southward until it connects with the Southern Railways of Peru at a point near Cuzco. This extension will bring within the reach of the coast the extensive coal deposits of Jatunhuasi where there is said to exist an excellent steaming and coking coal in almost inexhaustible quantity. A bill recently passed also provides for the extension of the Southern Railways of Peru and the State Railways of Bolivia. The extension of the Chimbote Railway will bring the rich silver mines and agricultural lands of the Department of Ancash within reach of the coast.

General News Department

The Pennsylvania Railroad has advanced the pay of large numbers of trackmen from \$2.10 a day to \$2.30.

The Oregon Short Line recently granted increases in pay averaging 7 per cent to its telegraph operators, numbering 286.

The striking telegraphers of the Great North Western Telegraph Company, Canada, returned to work October 1. The reports say that they received an advance in pay.

Arguments were to be heard by the United States Supreme Court this week in the Illinois passenger fare case involving conflict between the Illinois 2-cent fare law and a decision of the Interstate Commerce Commission establishing a rate of 2.4 cents a mile.

S. M. Felton, director general of railways, announces that twelve units of railway officers, consisting of division superintendents and their staffs, under a general manager and two general superintendents, are to be sent to Russia to rehabilitate the Trans-Siberian Railway.

The Supreme Court on Tuesday heard arguments on the appeal from a decision of the District of Columbia court holding that Milton H. Smith, president of the Louisville & Nashville, must answer questions propounded to him by the Interstate Commerce Commission having reference to the expenditure of the funds of the road for political purposes.

The Court of Appeals of Kentucky has affirmed the decision of the lower court imposing a fine of \$500 against the Mammoth Cave Railroad for failing to obey the law requiring separate cars for negroes. The road is nine miles long and runs a train twice a day carrying passengers and freight. Usually this train has one coach, carrying both passengers and baggage.

A conference was to have been held at Washington on Thursday of this week between a committee representing the Association of American Railway Accounting Officers and representatives of the Interstate Commerce Commission and of the National Association of Railway Commissioners, to consider the possibility of reducing to some extent the requirements of the commissions as to accounts and statistics to be furnished by the railroads, in order to reduce the amount of work required of their clerical forces during the war.

At the suggestion of the United States Food Administration R. H. Aishton, chairman of the Central Department Committee of the Railroads' War Board, has sent a circular to the railroads in the wheat belt asking them to take every action deemed expedient to eliminate fire hazards in the vicinity of country and terminal elevators. It is suggested that each individual road take action in the direction indicated and that they secure the cooperation of grain dealers to this end.

Between 350 and 400 switchmen on the Elgin, Joliet & Eastern struck on September 27 for a 50 per cent increase in wages. At the time of writing a settlement with the men had not yet been reached and the movement of traffic to and from the steel plants at South Chicago, Ill., and Gary, Ind., which the road serves, had been seriously interfered with. The steel plants have been unable to work at full capacity on account of the lack of transportation facilities since the strike went into effect.

The Chicago, Burlington & Quincy, the Chicago, Rock Island & Pacific, the Michigan Central and the Chicago & Alton, have filed claims for exemption for those of its train service employees coming within the age limit prescribed by the draft law, whose loss would cripple the efficiency of the road. The requests made by the roads are not in the nature of applications for blanket exemptions but are petitions for individual exemptions for those employees whose retention is most important from an operating standpoint.

The United States Civil Service Commission announces examinations, October 23, for freight rate clerk, men only, at salaries from \$1,200 to \$1,500. Positions are open in the War

Department at Philadelphia and at Norfolk. Applicants must have had five years' experience, and knowledge of the procedure on land grant railroads. At Norfolk, the clerk must have had experience in demurrage, billing and freight claims. The commission also announces examinations October 30 for senior signal engineer, grade 2, for the valuation department of the Interstate Commerce Commission, salaries \$1,800 to \$2,700. Applicants must be between 25 and 45 years old.

About 200 telegraphers on the northern (Buffalo & Allegheny) division of the Pennsylvania Railroad struck on September 26. It is said that the men acted independently of any regular union. The railroad company after issuing an ultimatum on September 28 proceeded to man the offices with operators from other divisions and elsewhere and passenger traffic was kept going, though with considerable delays for several days. Coincident with this report comes a despatch from Altoona saying that telegraphers on the middle division of the Pennsylvania (and, evidently, on other divisions) have had their pay advanced \$3.20 a month; and that this is the second advance which has been granted to them since September 1.

In passing the urgent deficiency appropriation bill on September 25, the Senate adopted an amendment to the provision governing the compensation to be paid to land grant railroads so as to provide that land grant railroads organized under the act of July 28, 1866, chapter 300, shall receive the same compensation for transportation of property and troops of the United States as is paid to land grant railroads organized under the land grant act of March 31, 1863, and the act of July 27, 1866, chapter 278. The purpose of this was to give the Missouri Pacific the usual land grant rate, 50 per cent of the regular rate, on that part of its line in Illinois serving a training camp. The line had a land grant dating from 1866, containing a provision under which the War Department has held that the road was entitled to no compensation.

Promotions in the Army

W. W. Atterbury, vice-president of the Pennsylvania Railroad, who, under General Pershing, has been in charge of railroad affairs in France several weeks, and who, on September 14, was appointed director general of transportation in that field, was, on October 2, nominated by President Wilson to be a brigadier-general in the National Army, with that rank from August 5. Colonel Chauncey B. Baker, of the Quartermaster Corps, was at the same time nominated to the same rank.

Railroad Port Agents Appointed

At the request of Colonel Chauncey B. Baker, chief of embarkation service, the Commission on Car Service has directed its various local sub-committees and interested railroads at other points to designate a representative as railroad port agent at each of the principal seaports of the country, to act as adviser to the local United States Army Quartermaster, or other officer sent temporarily to handle United States government freight for oversea shipment.

Women Employed to Replace Men Called to Colors

Railroads in the Middle West are gradually adding more women to their pay rolls to take the places of employees who have left to serve their country. The Northern Pacific recently employed four women for clerical work in the local freight office, eight in the yard office and one in the mechanical department at Duluth, Minn. In addition, the road already had at work six women in the roundhouse in that city, one in a clerical position in the car shops and 14 at manual labor. The women employed for manual labor in the mechanical department are largely engaged in wiping engines and cleaning up around the cinder pits, while of those in the car shops, one works at a bench repairing air apparatus and 13 are in the yard unloading grain-door lumber.

The Chicago, Burlington & Quincy has employed 12 women at its St. Joseph (Mo.) shops to clean up rubbish on repair tracks, sweep shop buildings and wipe locomotives. The Grand Trunk recently employed a woman ticket agent in its Chicago city office, and the Chicago & North Western a station mistress at Ames, Iowa.

Two prominent roads in the East have women at work in track-repair gangs.

Disastrous Collision at Kellyville, Okla.

In a butting collision of passenger trains on the St. Louis-San Francisco a short distance west of Kellyville, Okla., on the 28th of September 25 passengers were killed and 28 were injured. One of the trains was almost completely wrecked, while in the other a coach was telescoped by the mail car. A majority of the killed were negroes and the list included also three Indians. It is said that the men on the engines of both trains escaped serious injury. The eastbound train had the right to the road and the westbound should have waited for it at Kellyville; but the men in charge of the westbound, seeing an empty troop train standing on the side track assumed, without investigation, that this was the train which should be met at that point.

Luncheon to Australian Commissioner

The Railway Business Association was the host at a luncheon given at the Union League Club, Chicago, September 26, in honor of H. C. Hoyle, former Minister of Railways of New South Wales, who is making a tour of Canada and the United States as a special commissioner to deal with railway and other important problems in connection with war. Mr. Connelly, agent-general, in London, of Western Australia, who was in Chicago, was also the association's guest. George A. Post, president of the association, presided, and there were present about 80 members and guests. In Mr. Hoyle's address he said that he was getting in touch with makers of railway goods suitable for use in Australia. He is paying particular attention to cars and locomotives and their parts; problems of fuel and lubrication; machinery and tools; and labor-saving devices for use in railway construction, operation and maintenance. He requests manufacturers to send him catalogues and other information at Sydney, N. S. W.

Tuesday "Beefless Day" on Dining Cars

Commencing this week, Tuesday of every week will hereafter be "beefless day" in the dining cars and restaurants of many lines of the country. This step has been decided upon at the request of the United States Food Administration, for the purpose of aiding in conserving the beef supply of the country. The elimination of beef on Tuesdays will be complete, and will apply not only to steak and roast beef, but also to tongue, corned beef, rib-ends, ox-tails, etc.

For the purpose of further aiding the United States Food Administration in the campaign to eliminate waste in the use of foodstuffs of all kinds the Pennsylvania will place on the tables and counters of all its restaurant cars and restaurants cards containing a reprint of the Food Administration's general plan of saving. The reverse side of the card will contain the statement that the restaurant service of the Pennsylvania System is a member of the United States Food Administration.

Bankers' Railway Bulletin

A new series of the Bankers' Railway Bulletin, which first made its appearance ten years ago, but was discontinued, has been issued by Jean Paul Muller of the Statistical News Service, Washington, formerly a statistician of the Interstate Commerce Commission. The new series begins with the September issue and it is proposed to issue it at the end of the third week of each month hereafter, as long as the subject matter has news value. The purpose of the bulletin as originally published was to familiarize the financial press, the investment banker and the public with the chief items of current information relating to the financial results of railroad operation contained in the monthly reports of railways to the Interstate Commerce Commission. The new series is expected to be of special interest on account of the Interstate Commerce Commission's recent decision, in the 15 per cent rate case, in which it expressed the intention, for the future, of keeping in close touch with the operating results of the rail-

ways in connection with their desire for an advance in freight rates. It is intended to bring to the attention of those interested data now available monthly through a change in the form of the monthly report, which became effective on July 1, and to present results of railway operation deducible therefrom in a manner most easily understood by everybody, which is in terms of the average annual percentage and of return on the investment in railway property. This important feature is shown graphically on the front cover page in the form of a chart entitled "Barometer of Railway Earnings."

The September issue covers the July returns, which are reported by the carriers early in September. These show that the rate of return on investment in railway property (owned and leased) of the 186 Class I roads was slightly lower in July, 1917 (6.81 per cent), than it was in July, 1916 (7.00 per cent). It also shows that the rate of return for the first six months of the calendar year 1917 was lower than that for 1916. On another page the investment, net income and percentage are given by groups for the month of July and the seven months period of the year with comparisons with the previous year. Six pages of the report are devoted to the figures showing railway operating revenue, net railway operating income, investment in road and equipment and rate of return for the systems and individual roads, which will be of service to bankers and investors whose interests are confined to specific roads. On the final page is presented a copy of the new form of monthly reports which went into effect on July 1 and which makes it possible to show the percentage of return. The bulletin is prepared in such a way as to make it especially useful for convenient reference by those interested in an analysis of railway returns.

Three Railroads Subscribe \$15,000,000 to the Liberty Loan

One of the features of the first day's campaign for subscriptions to the second issue of the Liberty Loan were subscriptions of \$5,000,000 each by the Union Pacific and the Southern Pacific.

The directors of the Atchison, Topeka & Santa Fe Railway Company, at a meeting held on Tuesday, also voted to subscribe \$5,000,000 to the second Liberty Loan of 1917. This sum will be distributed through five of the Federal Reserve districts through which the road is operated.

American Electric Railway Association

The conference which is to take the place of the annual convention of the American Electric Railway Association and its affiliated bodies, The American Electric Railway Accountants' Association, the American Electric Engineering Railway Association, the American Electric Railway Claims Association, and the American Electric Railway Transportation and Traffic Association, will be held at the Engineering Societies building, 29 West 39th street, New York, October 9, at 9:30 a. m.

The program includes papers on the following subjects: "General Survey of Present Electric Railway Problems"; "Is the War Bonus Practicable as a Means of Wage Adjustment in the Electric Railway Industry?"; "Female Substitutes for Male Employees"; "The Pending Applications for Fare Increases in New York State." There will also be topical discussions on various methods of increasing fares: (a) "Charge for Transfers," (b) "Increases in Flat Rates for Present Zones," (c) "Shortening Present Single Fare Zones."

Engineers' Society of Western Pennsylvania

At the regular monthly meeting of the Engineers' Society of Western Pennsylvania to be held in the auditorium of the Union Arcade building in Pittsburgh, October 16, an illustrated paper will be presented by George H. Barbour, a mechanical engineer of Pittsburgh on "Wheel Contracts on Rail Heads."

Associated Business Papers Convention

The annual convention of the Associated Business Papers, Inc., will be held at the Congress Hotel, Chicago, October 11, 12 and 13. The program for the morning sessions will cover special problems of the business papers. On the afternoon of October 11 the editors will be in charge and will discuss problems concerned with increased effectiveness of the business papers during the war and following its close. On the afternoon of October 12 the general topic will be "Business and the War" and speakers of

national importance will discuss the transportation problem, foreign trade, control of prices and supply of raw materials, co-ordination of business and government, and merchandizing and the war. "Business and the War" will also be the underlying thought of the program at the annual dinner on Friday evening, October 12. Governor Whitman will be one of the speakers.

New England Railroad Club

The next regular meeting of this club will be held at Copley Square Hotel, Boston, Tuesday evening, October 9. There will be an address on "The Freight Car; a Factor in Winning the War," by E. H. DeGroot, Jr., chief of the division of car service of the Interstate Commerce Commission.

MEETINGS AND CONVENTIONS

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

AIR TRAKE ASSOCIATION.—F. M. Nellis, Room 3014, 165 Broadway, New York City.

AMERICAN ASSOCIATION OF DEMERBAGE OFFICERS.—F. A. Portious, 455 Grand Central Station, Chicago.

AMERICAN ASSOCIATION OF DINING CAR SUPERINTENDENTS.—H. C. Boardman, D. L. W., Hoboken, N. J. Next convention, to have been held October, 1917, San Francisco, Cal., indefinitely postponed.

AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, Illinois Central, Chicago, Ill.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. K. N. J., 143 Liberty St., New York. Next meeting, October 16-17, St. Louis.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Harman, Room 101, Union Station, St. Louis, Mo.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—E. B. Burritt, 8 W. 40th St., New York. Convention for 1917 postponed.

AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOCIATION.—Fred C. J. Dell, 165 Broadway, New York.

AMERICAN RAILROAD MASTER TINNERS', COPPERSMITHS' AND PIPEFITTERS' ASSOCIATION.—W. E. Jones, C. & N. W., 3814 Fulton St., Chicago. Convention for 1917 postponed.

AMERICAN RAILWAY ASSOCIATION.—J. E. Fairbanks, general secretary, 75 Church St., New York.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 16-18, 1917, Chicago.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, 1112 Karpen Bldg., Chicago.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—Owen D. Kinsey, Illinois Central, Chicago.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Augier, Supt. Timber Preservation, U. S. M. & M. Royal Sta., Baltimore, Md. Next convention, January, 1918, Chicago.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—E. R. Woodson, Rooms 1116-8 Woodward Bldg., Washington, D. C.

ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Semi-annual meeting with Master Car Builders' Association.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—Willis H. Failing, Terminal Station, Central, New Jersey, Jersey City, N. J.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago. Semi-annual and annual convention postponed indefinitely.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—W. L. Connelly, Superintendent of Telegraph, Indiana Harbor Belt, Gibson, Ind.

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 75 Church St., New York.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—Tom Lehon, The Lehon Company, Chicago. Meetings with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 177 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Tuesday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—W. R. McMurphy, New York Central, Albany, N. Y.

CINCINNATI RAILWAY CLUB.—H. Boutet, Chief Interchange Inspector, Cincinnati, Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 568 Union Avenue Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Traffic Manager, R. F. & P., Richmond, Va.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, C. H. & D., Lima, Ohio.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—J. G. Crawford, C. B. & Q. R. R., 702 E. 51st St., Chicago. Next convention, May, 1918, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1126 W. Broadway, Winona, Minn.

INVESTMENT BANKERS' ASSOCIATION OF AMERICA.—Frederick R. Fenot, 11 W. Monroe St., Chicago.

MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—F. W. Haret, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 16-18, 1917, Cleveland, Ohio.

MASTER BOILER MAKERS' ASSOCIATION.—HARRY D. Vought, 95 Liberty St., New York.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—A. P. Dine, B. & M. Reading, Mass.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, 1112 Karpen Bldg., Chicago.

NATIONAL ASSOCIATION OF RAILWAY COMMISSIONERS.—Jas. B. Walker, 120 Broadway, New York City. Next annual convention, October 16, 1917, Washington, D. C.

NATIONAL RAILWAY APPLIANCE ASSOCIATION.—C. W. Kelly, 349 Peoples Gas Bldg., Chicago.

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

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meetings, 2d Tuesday in month, except June, July and August, 29 W. 39th St., New York.

Niagara Frontier Car Men's Association.—Geo. A. J. Hochgrebe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PACIFIC RAILROAD CLUB.—W. S. Wollner, Assistant to Chief Engineer, Northwestern Pacific R. R., San Francisco, Cal.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Johnson Hotel, Peoria, Ill.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 30 Church St., New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Tuesday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial Annex Hotel, Pittsburgh.

RAILWAY DEVELOPMENT ASSOCIATION.—D. C. Welty, Commissioner of Agriculture, St. Louis, Mo. Regular meetings, 1st and 3d Tuesday, Exchange Bldg., St. Louis. Next annual convention, May, 1918, Houston, Tex.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—J. Scribner, 1063 Monadnock Block, Chicago. Meetings with Association of Railway Electrical Engineers.

RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, Office of the President's Assistant, Seaboard Air Line, Norfolk, Va.

RAILWAY REAL ESTATE ASSOCIATION.—R. H. Morrison, Assistant Engineer, 1912 DuPont, Wash., D. C. Next convention, to have been held October, 1917, DuPont, Wash., D. C., indefinitely postponed.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, N. Y. C. R. R., Box Collinwood, Ohio.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 2136 Oliver Bldg., Pittsburgh, Pa. Meetings with Master Car Builders' and Master Mechanics' Association.

RAILWAY TELEGRAPH AND APPLIANCE ASSOCIATION.—G. A. Nelson, 50 Church St., New York. Meetings with Association of Railway Telegraph Superintendents.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September 17-19, St. Louis.

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

SALT LAKE TRANSPORTATION CLUB.—R. E. Rowland, David Keith Bldg., Salt Lake City, Utah. Regular meetings, 1st Saturday of each month, Salt Lake City.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOCIETY OF RAILWAY ELECTRICAL OFFICIALS.—W. C. Hall, C. & N. W., Philadelphia, Pa. Next annual convention, October 16-18, St. Louis, Mo.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. V. R. R., Atlanta, Ga.

SOUTHERN & SOUTHWEST RAILWAY CLUB.—A. J. Merrill, Grant Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.

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

TRAFFIC CLUB OF CHICAGO.—C. B. Signer, La Salle Hotel, Chicago.

TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7122 Stewart Ave., Chicago. Next annual convention, June 18, 1918, Grand Rapids, Mich.

TRAFFIC CLUB OF PITTSBURGH.—D. J. Wells, Gen'l Ag't, Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings bi-monthly, Pittsburgh.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio.

UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

WESTERN ASSOCIATION OF SHORT LINE RAILROADS.—Clarence M. Oddie, Mills Bldg., San Francisco.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

WESTERN SOCIETY OF ENGINEERS.—Edgar S. Nethercutt, Acting Secretary, 1735 Monadnock Block, Chicago, Ill. Regular meeting, first Monday in month, except January, July and August. Extra meetings generally on other Monday evenings except in July and August.

REVENUES AND EXPENSES OF RAILWAYS

SEVEN MONTHS OF CALENDAR YEAR, 1917

Name of road.	Average mileage operated during period.	Operating revenues.				Operating expenses.			Operating ratio.	Net railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decrease) over last year.
		Freight.	Passenger.	Total (inc. misc.).	Way and structures.	Equipment.	Traffic.	Transportation.					
Chicago, Rock Island & Pacific.	7,685	\$2,535,098	\$1,484,002	\$4,019,088	\$6,258,874	\$9,301,651	\$953,022	\$18,121,394	\$76.33	\$11,188,693	\$2,189,830	\$8,998,863	\$1,395,549
Chicago, St. Paul, Minn. & Omaha.	7,685	1,806,793	1,118,900	2,925,693	4,340,452	6,258,874	201,425	4,340,452	72.74	4,186,922	694,367	2,477,920	185,534
Chicago, Terre Haute & Southeastern.	1,578	1,806,793	1,118,900	2,925,693	4,340,452	6,258,874	201,425	4,340,452	72.74	4,186,922	694,367	2,477,920	185,534
Cincinnati, Hamilton & Dayton.	337	533,800	1,565,628	2,100,411	583,116	1,694,798	202,086	2,299,833	66.94	4,551,776	33,900	4,517,876	99,705
Cincinnati, New Orleans & Texas Pacific.	337	533,800	1,565,628	2,100,411	583,116	1,694,798	202,086	2,299,833	66.94	4,551,776	33,900	4,517,876	99,705
Cincinnati Northern.	246	1,180,780	1,000,820	2,181,600	1,180,780	1,000,820	571,341	2,181,600	72.81	3,836,599	49,600	3,786,999	33,921
Cleveland, Cincinnati, Chic. & St. Louis.	2,387	2,001,621	6,264,831	8,266,452	5,933,314	18,032,321	87,841	22,955,635	77.95	30,833.8	69,000	25,827.8	18,546
Coal & Coke.	197	596,672	123,435	720,107	596,672	123,435	13,881	710,553	72.81	7,893,639	1,120,000	6,773,639	537,144
Colorado Midland.	338	189,846	36,843	226,689	60,335	1,037,391	13,881	1,051,272	62.86	31,423.39	314,737	31,108.65	588.41
Colorado & Wyoming.	1,433	2,117,720	911,510	3,029,230	1,037,391	2,990,000	80,802	3,070,802	59.65	284,720	338,777	260,842	15,628
Cripple Creek & Colorado Springs.	87	244,745	90,967	335,712	58,620	161,888	891	229,554	42.10	2,409.09	28,837	26,431.9	54,444
Cumberland Valley.	164	2,247,765	389,386	2,637,151	210,383	3,488,665	29,742	3,518,407	65.94	990.61	190,227	800,387	698,436
Delaware & Hudson Co., R. R. Dept.	879	1,414,670	1,631,497	3,046,167	1,531,871	3,488,665	183,322	3,672,000	65.94	2,881,491	436,291	2,445,200	804,900
Denver & Rio Grande.	9,768	1,000,868	12,677,727	13,678,595	2,644,496	5,039,700	54,094	11,574,546	62.83	17,913,898	1,851,062	16,062,836	1,142,400
Denver & Salt Lake.	335	890,547	187,157	1,077,704	1,623,894	2,990,000	15,093	3,005,888	67.66	11,579,389	693,011	10,886,378	1,142,400
Detroit & Mackinac.	335	1,016,800	187,157	1,203,957	1,623,894	2,990,000	15,093	3,005,888	67.66	11,579,389	693,011	10,886,378	1,142,400
Detroit & Toledo Road Line.	81	1,077,567	261,904	1,339,471	1,077,567	261,904	12,038	1,090,605	74.65	3,741.03	56,274	3,684,761	112,669
Detroit, Toledo & Milwaukee.	431	1,353,873	261,904	1,615,777	1,712,123	2,990,000	29,649	1,641,833	90.07	148,764	56,000	92,737	173,603
Duluth & Iron Range.	270	331,597	1,315,946	1,647,543	161,616	2,990,000	10,810	975,641	65.94	990.61	190,227	800,387	698,436
Duluth, Missabe & Northern.	414	5,824,281	226,914	6,051,195	1,712,123	1,848,848	18,636	5,186,017	72.50	2,498,378	335,290	2,163,087	726,110
Duluth, South Shore & Atlantic.	600	1,734,716	568,515	2,303,231	1,182,311	1,848,848	18,636	5,186,017	72.50	2,498,378	335,290	2,163,087	726,110
Elgin, Joliet & Eastern.	991	1,080,143	1,711,235	2,791,378	1,080,143	2,791,378	57,159	3,361,537	68.87	4,551,776	33,900	4,517,876	99,705
Florida East Coast.	997	5,909,247	39,715,589	45,624,836	3,495,008	9,466,672	66,874	18,184,145	83.73	1,571,391	1,571,391	0	0
Fort Worth & Denver City.	765	2,757,684	427,247	3,184,931	1,488,667	11,339,276	1,488,667	11,339,276	48.48	2,776,405	256,903	2,519,502	31,945
Galveston, Harrisburg & San Antonio.	454	2,399,399	835,387	3,234,786	3,434,363	3,460,734	59,937	3,524,363	63.83	1,146,732	1,146,732	0	0
Galveston Wharf.	1,360	7,795,344	2,536,279	10,331,623	1,360,795	1,360,795	2,183	20,812	57.49	2,677,684	76,500	2,601,184	216,522
Georgia, Southern & Florida.	402	1,916,827	524,130	2,440,957	1,848,582	3,685,201	94,736	2,563,318	75.05	507,326	40,593	466,733	23,770
Grand Rapids & Indiana.	575	2,466,720	870,521	3,337,241	3,645,349	4,555,565	30,440	3,675,773	82.15	280,743	86,698	194,045	37,963
Grand Trunk Western.	347	4,216,815	885,283	5,102,098	5,102,098	5,102,098	114,157	5,216,255	78.81	586,625	166,057	420,568	122,694
Gulf & Ship Island.	8,210	34,964,924	8,549,884	43,514,808	48,402,742	7,221,579	766,179	16,843,527	69.04	14,922,160	2,600,295	11,999,865	205,096
Gulf, Mobile & Santa Fe.	1,907	7,050,295	1,207,975	8,258,270	1,719,179	1,719,179	23,138	371,122	68.08	377,091	308,850	68,241	65,476
Houston, East & West Texas.	349	4,866,145	525,981	5,392,126	5,042,021	5,042,021	13,839	5,055,860	72.75	2,575,769	438,549	2,139,210	861,267
Illinois & Kansas Central.	2,211	2,060,431	899,793	2,960,224	590,862	5,232,311	123,719	1,310,990	66.87	1,389,116	239,907	1,159,209	57,234
Indiana Harbor Belt.	49	35,944,261	8,973,660	44,917,921	4,425,280	8,883,313	763,347	16,016,450	70.34	14,530,962	3,509,713	11,021,249	272,740
International & Great Northern.	1,159	4,610,459	1,447,317	6,057,776	1,388,053	2,016,606	3,111,325	3,938,848	68.78	6,877,319	68,459	6,808,860	9,013
Kansas & Missouri.	177	1,625,435	218,343	1,843,778	1,843,778	1,843,778	19,847	5,814,714	75.37	756,172	61,357	694,815	98,817
Kansas City Southern.	222	533,270	80,445	613,715	113,677	188,485	38,015	371,352	61.87	1,900,474	242,638	1,657,836	703,387
Kansas City, Mexico & Orient of Texas.	755	5,920,421	1,212,429	7,132,850	1,397,719	182,197	27,812	404,891	68.87	42,660	72,163	30,497	21,910
Kansas City Terminal.	90	4,090,732	374,424	4,465,156	4,465,156	4,465,156	76,675	4,541,831	61.87	2,653,522	354,613	2,298,909	42,135
Late Erie & Western.	906	1,151,308	26,331	1,177,639	649,180	980,768	1,837,364	1,837,364	66.10	440,293	39,700	400,993	101,053
Lehigh & New River.	247	1,550,466	26,331	1,576,797	1,576,797	1,576,797	10,909	1,587,706	66.10	440,293	39,700	400,993	101,053
Lehigh Valley.	1,209	1,550,466	26,331	1,576,797	1,576,797	1,576,797	10,909	1,587,706	66.10	440,293	39,700	400,993	101,053
Long Island.	302	667,705	129,695	797,400	3,374,544	583,494	13,091,580	67,237	76.24	7,231,633	1,261,140	5,970,493	80,715
Louisiana & Arkansas.	302	667,705	129,695	797,400	3,374,544	583,494	13,091,580	67,237	76.24	7,231,633	1,261,140	5,970,493	80,715
Louisiana, Bay & Navigation Co.	342	990,433	187,144	1,177,577	1,060,663	1,764,431	55,301	432,888	75.28	311,117	119,172	191,945	102,591
Louisville, Henderson & St. Louis.	207	1,304,692	494,468	1,799,160	1,662,614	2,317,558	43,219	3,100,383	49.66	963,617	127,903	835,714	177,460
Louisville, Nashville.	5,070	31,213,466	2,451,819	33,665,285	5,628,082	15,844,644	34,337	14,074,544	63.57	13,411,510	216,224	11,195,286	62,383
Maine Central.	1,216	51,315,559	2,031,839	53,347,398	1,008,191	1,000,233	9,376	1,017,609	69.05	40,694,959	1,067,583	39,627,376	1,673,437
Michigan Central.	1,861	19,209,815	6,687,956	25,897,771	3,172,121	4,481,952	468,133	12,932,179	75.47	7,712,753	1,306,488	6,406,265	1,857,559
Minneapolis & St. Louis.	345	1,205,275	324,650	1,529,925	1,593,122	3,664,488	21,711	506,729	73.32	435,026	31,367	403,659	162,493
Missouri & St. Paul.	1,646	14,630,040	1,041,413	15,671,453	1,041,413	1,041,413	3,366	381,159	100.52	1,708,944	317,714	1,391,230	264,703
Missouri & North Arkansas.	4,38	6,055,621	31,378	6,086,999	2,094,351	2,094,351	2,686	2,686	66.21	4,386,356	1,371,583	3,014,773	1,601,903
Missouri, Kansas & Texas System.	3,864	16,615,952	5,321,900	21,937,852	4,159,272	4,483,342	465,235	8,512,545	80.58	15,156,344	34,300	15,122,044	11,406
Missouri, Kansas & Texas System.	3,864	16,615,952	5,321,900	21,937,852	4,159,272	4,483,342	465,235	8,512,545	80.58	15,156,344	34,300	15,122,044	11,406
Missouri, Ohio & Gulf of Texas.	116	144,507	15,727	160,234	188,752	188,752	30,641	462,333	82.67	4,187,407	561,298	3,626,109	1,958,468
Missouri, Ohio & Gulf of Texas.	116	144,507	15,727	160,234	188,752	188,752	30,641	462,333	82.67	4,187,407	561,298	3,626,109	1,958,468
Missouri, Ohio & Gulf of Texas.	116	144,507	15,727	160,234	188,752	188,752	30,641	462,333	82.67	4,187,407	561,298	3,626,109	1,958,468

† Merged with R. & O. as of July 19, 1917.

REVENUES AND EXPENSES OF RAILWAYS
SEVEN MONTHS OF CALENDAR YEAR, 1917—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues—			Operating expenses—			Total.	Operating ratio.	Net from railway operation.	Railway tax accruals.	Operating income (or loss) last year.
		Freight.	Passenger.	(Inc. mic.)	Traffic.	Trans- portation.	General.					
Missouri Pacific	7,295	\$1,280,280	\$2,940,940	\$12,956,647	\$1,991,307	\$287,187	\$93,297	\$3,684,418	\$67.01	\$2,421,229	\$30,000	\$3,721,958
Mobile & Ohio	1,166	6,530,238	832,392	7,362,630	1,763,377	263,139	281,818	5,783,448	74.60	2,056,703	334,293	1,720,403
Monongahela	1,080	1,117,729	1,279,615	2,397,344	824,417	6,663	28,431	3,175,790	87.43	140,586	13,119	127,467
Monongahela Connecting	406	2,631,127	757,123	3,388,250	226,038	2,400	54,574	2,977,799	89.34	1,490,489	13,119	1,265,504
Monongahela, Tex. & S. Co.	406	2,631,127	757,123	3,388,250	226,038	2,400	54,574	2,977,799	89.34	1,490,489	13,119	1,265,504
Nashville, Chattanooga & St. Louis	1,237	2,543,734	1,798,312	4,342,046	859,163	389,043	253,041	6,386,902	76.86	1,923,275	210,000	90,627
Nevada, Northern	165	1,924,910	1,007,440	2,932,350	140,162	139,959	33,115	3,766,322	41.51	1,811,654	71,354	1,740,097
New England & St. Louis	1,665	2,704,732	1,798,312	4,503,044	889,161	889,161	38,041	6,386,902	76.86	1,923,275	210,000	90,627
New Orleans & Eastern	399	1,253,910	404,246	1,658,156	139,599	72,959	33,115	2,081,203	67.02	1,740,097	178,340	662,674
New Orleans & Lake Charles	399	1,253,910	404,246	1,658,156	139,599	72,959	33,115	2,081,203	67.02	1,740,097	178,340	662,674
New Orleans Great Northern	284	776,823	197,621	974,444	110,246	22,026	46,830	1,220,580	69.66	338,311	4,900	228,623
New Orleans, Texas & Mexico	194	596,366	197,621	793,987	120,829	33,792	46,830	547,522	69.66	338,311	4,900	228,623
New York, Chicago & St. Louis	6,982	83,571,853	31,526,717	115,098,570	14,209,811	1,785,639	98,228,419	150,400,000	58.52	35,473,245	6,620,403	10,367,515
New York, Chicago & St. Louis	6,982	83,571,853	31,526,717	115,098,570	14,209,811	1,785,639	98,228,419	150,400,000	58.52	35,473,245	6,620,403	10,367,515
New York, New Haven & Hartford	1,993	2,325,158	185,528	2,510,686	470,381	112,021	96,262	3,002,948	78.52	2,030,748	350,000	1,720,748
New York, New Haven & Hartford	1,993	2,325,158	185,528	2,510,686	470,381	112,021	96,262	3,002,948	78.52	2,030,748	350,000	1,720,748
New York, Philadelphia & Norfolk	112	2,417,040	375,607	2,792,647	324,412	34,434	232,298	2,730,742	73.17	1,819,115	10,050	1,729,065
New York, Philadelphia & Norfolk	112	2,417,040	375,607	2,792,647	324,412	34,434	232,298	2,730,742	73.17	1,819,115	10,050	1,729,065
New York, Susquehanna & Western	2,085	3,914,579	3,415,411	7,330,000	6,676,338	454,338	67,616	7,343,954	75.01	516,438	113,166	402,693
Norfolk & Western	2,085	3,914,579	3,415,411	7,330,000	6,676,338	454,338	67,616	7,343,954	75.01	516,438	113,166	402,693
Norfolk Southern	4,048	2,295,443	642,093	2,937,536	384,156	459,413	140,124	2,088,022	66.93	1,031,238	105,105	926,223
Norfolk Southern	4,048	2,295,443	642,093	2,937,536	384,156	459,413	140,124	2,088,022	66.93	1,031,238	105,105	926,223
Northern Pacific	6,515	37,128,339	8,451,435	45,579,774	6,800,429	723,199	21,421,310	53,063,681	67.28	8,827,268	132,124	7,055,467
Northern Pacific	6,515	37,128,339	8,451,435	45,579,774	6,800,429	723,199	21,421,310	53,063,681	67.28	8,827,268	132,124	7,055,467
Northwestern Pacific	2,507	1,177,442	1,159,131	2,336,573	319,312	38,742	92,035	1,773,551	65.88	1,453,538	134,532	642,102
Northwestern Pacific	2,507	1,177,442	1,159,131	2,336,573	319,312	38,742	92,035	1,773,551	65.88	1,453,538	134,532	642,102
Oregon Short Line	2,507	1,177,442	1,159,131	2,336,573	319,312	38,742	92,035	1,773,551	65.88	1,453,538	134,532	642,102
Oregon Short Line	2,507	1,177,442	1,159,131	2,336,573	319,312	38,742	92,035	1,773,551	65.88	1,453,538	134,532	642,102
Oregon Washington, R. & Nav. Co.	2,052	8,885,271	2,812,343	11,697,614	1,803,711	320,935	54,543	12,478,066	61.19	1,510,562	130,778	1,379,786
Panhandle & Santa Fe	676	31,473,594	43,682,559	75,156,153	5,283,809	37,745	23,857	78,063,681	80.31	8,598,488	244,023	6,054,175
Pennsylvania Company	1,755	31,473,594	43,682,559	75,156,153	5,283,809	37,745	23,857	78,063,681	80.31	8,598,488	244,023	6,054,175
Pennsylvania Company	1,755	31,473,594	43,682,559	75,156,153	5,283,809	37,745	23,857	78,063,681	80.31	8,598,488	244,023	6,054,175
Pennsylvania Railroad	4,513	102,847,677	28,412,948	131,260,625	17,719,407	1,530,980	57,208,560	196,576,667	77.56	32,614,844	5,805,378	26,797,697
Pennsylvania Railroad	4,513	102,847,677	28,412,948	131,260,625	17,719,407	1,530,980	57,208,560	196,576,667	77.56	32,614,844	5,805,378	26,797,697
Puerto Rico & Peking Union	2,085	3,914,579	3,415,411	7,330,000	6,676,338	454,338	67,616	7,343,954	75.01	516,438	113,166	402,693
Puerto Rico & Peking Union	2,085	3,914,579	3,415,411	7,330,000	6,676,338	454,338	67,616	7,343,954	75.01	516,438	113,166	402,693
Rocky Mountain	2,507	1,177,442	1,159,131	2,336,573	319,312	38,742	92,035	1,773,551	65.88	1,453,538	134,532	642,102
Rocky Mountain	2,507	1,177,442	1,159,131	2,336,573	319,312	38,742	92,035	1,773,551	65.88	1,453,538	134,532	642,102
St. Joseph & Grand Island	468	1,394,256	686,719	2,080,975	300,848	396,689	67,047	2,026,809	56.63	1,865,800	125,736	448,082
St. Joseph & Grand Island	468	1,394,256	686,719	2,080,975	300,848	396,689	67,047	2,026,809	56.63	1,865,800	125,736	448,082
St. Louis & Iron Mountain	258	1,116,912	1,272,491	2,389,403	454,119	164,699	26,007	2,518,117	86.02	1,920,308	61,808	1,301,314
St. Louis & Iron Mountain	258	1,116,912	1,272,491	2,389,403	454,119	164,699	26,007	2,518,117	86.02	1,920,308	61,808	1,301,314
St. Louis, Merchant's Bridge Terminal	2,085	3,914,579	3,415,411	7,330,000	6,676,338	454,338	67,616	7,343,954	75.01	516,438	113,166	402,693
St. Louis, Merchant's Bridge Terminal	2,085	3,914,579	3,415,411	7,330,000	6,676,338	454,338	67,616	7,343,954	75.01	516,438	113,166	402,693
St. Louis, San Francisco	4,754	21,284,278	7,868,372	29,152,650	3,713,592	460,306	10,993,093	39,946,291	72.98	15,132,018	52,804	418,415
St. Louis, San Francisco	4,754	21,284,278	7,868,372	29,152,650	3,713,592	460,306	10,993,093	39,946,291	72.98	15,132,018	52,804	418,415
St. Louis, San Francisco & Seattle	2,712	1,440,503	1,534,480	2,974,983	1,136,682	115,418	31,263	2,622,343	92.28	510,232	10,438	43,668
St. Louis, San Francisco & Seattle	2,712	1,440,503	1,534,480	2,974,983	1,136,682	115,418	31,263	2,622,343	92.28	510,232	10,438	43,668
St. Louis, San Francisco & Texas	3,712	2,140,657	7,051,615	9,192,272	436,512	324,957	99,986	2,603,067	96.12	81,088	105,000	99,334
St. Louis, San Francisco & Texas	3,712	2,140,657	7,051,615	9,192,272	436,512	324,957	99,986	2,603,067	96.12	81,088	105,000	99,334
Southern	6,983	83,571,853	31,526,717	115,098,570	14,209,811	1,785,639	98,228,419	150,400,000	58.52	35,473,245	6,620,403	10,367,515
Southern in Mississippi	298	407,813	192,749	600,562	142,332	15,126	393,892	540,004	81.43	133,183	71,250	51,933
Spokane, Portland & Seattle	7,103	53,881,519	18,209,112	72,090,631	10,540,610	1,244,997	27,751,191	88,890,099	63.66	28,601,957	389,939	24,691,121
Spokane, Portland & Seattle	7,103	53,881,519	18,209,112	72,090,631	10,540,610	1,244,997	27,751,191	88,890,099	63.66	28,601,957	389,939	24,691,121
Staten Island Rapid Transit Co.	295	698,304	230,155	928,459	100,362	3,966	401,911	1,177,639	78.53	213,178	33,600	179,543
Staten Island Rapid Transit Co.	295	698,304	230,155	928,459	100,362	3,966	401,911	1,177,639	78.53	213,178	33,600	179,543
Texas & Pacific	37	4,240,183	768,421	5,008,604	392,770	61,993	10,906	5,462,373	71.95	4,351,468	18,995	91,915
Texas & Pacific	37	4,240,183	768,421	5,008,604	392,770	61,993	10,906	5,462,373	71.95	4,351,468	18,995	91,915
Texas & Pacific	37	4,240,183	768,421	5,008,604	392,770	61,993	10,906	5,462,373	71.95	4,351,468	18,995	91,915
Texas & Pacific	37	4,240,183	768,421	5,008,604	392,770	61,993	10,906	5,462,373	71.95	4,351,468	18,995	91,915
Texas & Pacific	37	4,240,183	768,421	5,008,604	392,770	61,993	10,906	5,462,373	71.95	4,351,468	18,995	91,915
Texas & Pacific	37	4,240,183	768,421	5,008,604	392,770	61,993	10,906	5,462,373	71.95	4,351,468	18,995	91,915
Texas & Pacific	37	4,240,183	768,421	5,008,604	392,770	61,993	10,906	5,462,373	71.95	4,351,468	18,995	91,915
Texas & Pacific	37	4,240,183	768,421	5,008,604	392,770	61,993	10,906	5,462,373	71.95	4,351,468	18,995	91,915
Texas & Pacific	37	4,240,183	768,421	5,008,604	392,770	61,993	10,906	5,462,373	71.95	4,351,468	18,995	91,915
Texas & Pacific	37	4,240,183	768,421	5,008,604	392,770	61,993	10,906	5,462,373	71.95	4,351		

Traffic News

The Maine Central announces a schedule of "sailing days," at its principal freight stations, for less than carload shipments of freight.

The Lehigh Valley announces the discontinuance of its lake freight line between Buffalo and Chicago, the four steamships which have been used in this service having been taken over by the government for use on the Atlantic Ocean. The company regrets to announce this suspension of freight traffic, but recognizes that the members of the Shipping Board at Washington are best qualified to decide where the boats are needed; and "we are glad that we had ships which the government could use to good advantage in winning the war."

The Alabama Public Service Commission believes that, by October 25, when most of the troops will have been moved to their camps, the railroads of that state ought to resume the operation of certain passenger trains which were taken off two months ago, and the different roads have been called upon to appear before the commission October 16. The commissioners think that the reduced passenger service should be continued only so long as the locomotives are needed for the movement of troops and of supplies for the army and navy.

Shipments of grain over the Canadian Northern from western Canada, during the last crop year, the year ending August 31, amounted to 100 million bushels, which is about 32 per cent of all of the grain inspected in western Canada during the year. The number of cars moved was 88,953, of which 60,551 cars went to Port Arthur. The records of inspection show a crop movement this year of about 35 per cent less than in the crop of the year preceding; but the quantity inspected on the Canadian Northern was slightly larger than in the year before.

In the United States Court at Baltimore, Md., September 26, the Quemahoning Coal Company, of Pennsylvania, filed a complaint against the Baltimore & Ohio for alleged unfair discrimination in the enforcement of its embargo on coal destined to Baltimore, claiming that its cars of coal were held at Cumberland while shipments consigned to the Tidewater Coal Exchange Pool continued to go forward. It is understood that the suit is in the nature of a complaint against the operation of the pool of coal shipment, favored by the government, for economizing space in ocean vessels.

Pacific coast shippers, by co-operating in heavier car loading saved during the month of August enough cars to supply the Southern Pacific's entire Pacific system for one and one-half days. About 3,000 cars are required daily to fill the demands of the shippers on the system. By heavier car-loading 4,537 cars were saved during August, 1917, as compared with the same month last year. It is estimated that this saving was sufficient to provide during August all the cars required to load the following commodities: sugar, paper, peas, beans, salt, dried fruits, canned goods, rice, potatoes, corn, oats and brick.

H. A. Garfield, United States fuel administrator, on October 2 issued an order prohibiting for the time being the shipment of coal into Canada from lake ports. The purpose is to divert this coal to the northwest where there is need for a million tons a week during the remainder of the season of navigation. While the shipments have approximated the required amount a large part of the coal has been diverted into Canada. The order states that the quantity of coal moving by vessel from Lake Erie ports to American lake ports on Lake Superior and Michigan is inadequate as compared with the quantity moving to Canadian lake ports and other American lake ports and that the supply of coal at present available for shipment by rail and of railroad freight cars for the carrying thereof are insufficient to make up the deficiency in the supply of coal moving by lake. Therefore, all producers of coal having contracts for delivery to lake ports for trans-shipment are ordered to continue such shipments to at least the same extent and with the same frequency as at present or heretofore since September 1 and dock companies, shippers and

other agencies receiving such coal at Lake Erie ports are ordered to forward the same by the earliest available carrier by water to American lake ports on Lake Superior or Lake Michigan. They are also prohibited from consigning, reshipping or reconsigning any such coal to any points either in Canada or the United States other than points in the northwest which have heretofore usually been supplied with coal from such American ports on Lake Superior and Michigan.

Barlow Talks to Chicago Committee

H. C. Barlow, traffic director of the Chicago Association of Commerce, and until recently advisory member of the Division of Car Service of the Interstate Commerce Commission, addressed the meeting of the Chicago committee of the Commission on Car Service on September 25. He strongly urged upon the railroads the necessity for reducing the time cars are not in motion. He gave the results of a check he had made of the movement of a number of cars which disclosed some very unsatisfactory conditions and he believed that notwithstanding the great improvement that had been made in the service even more could be done. In regard to the proposed earlier closing of freight houses in Chicago, he said the present hours were fixed by mutual agreement between the Chicago Association of Commerce and the railroads. The best merchandise terminals are the most expensive plant in the railroad service and he left with the railroads the question as to whether they could afford to decrease their ability to receive freight by further curtailing the hours that the freight houses are open. Mr. Barlow strongly disapproved of any attempt to restrict or eliminate the use of trap cars. He believes that their practicability both from a railroad and a commercial standpoint has been thoroughly established.

Full Loading of Cars Urged by Fertilizer Committee

The subcommittee on fertilizers of the committee on chemicals of the advisory commission of the Council of National Defense has issued a statement impressing upon shippers the importance of loading freight cars to capacity, which says:

"The commerce of the United States requires the maximum service of the railroads in the present emergency. The requirements from the railroads on the part of the government in moving vast quantities of construction and building material will tax the railroads to the limit. The supply of cars for government shipments will of necessity take preference, and rightly so. The government departments have used their influence with shippers, encouraging them to make the maximum use of all cars, and trade organizations have undertaken a campaign of education with the object of getting greater use out of present equipment, but the public at large does not as yet realize the seriousness of the situation. The continued assistance of every government department is necessary if the United States is to avoid being embarrassed. It is most unpatriotic of any shipper who loads a car to fail to make the maximum use of it by loading to its full carrying capacity. The failure of one shipper to load cars to the maximum may prevent other shippers from getting any cars at all. If you can give these recommendations consideration and practicable application, it will be entirely in the interest of moving the maximum amount of traffic the facilities of the carriers permit. We feel that the full capacity of the facilities of the carriers and receivers of freight will not satisfy the demand, but it would be more nearly satisfied if every freight car is made to carry the maximum quantity."

ENGLISH RAILWAY OFFICER TO VISIT U. S.—It is stated that Sir Alexander Kaye Butterworth, the general manager of the North-Eastern Railway, is, at the instance of the government, going to America to assist the industrial organization in the United States.—*The Engineer, London.*

COST OF CANADIAN RAILWAY INQUIRY.—The cost of the commission which reported on the railway situation in Canada, recently, was stated in the Senate recently by Sir James Loughheed to have been \$70,088.41. W. M. Acworth received \$15,330 for services and \$1,127.99 for expenses; A. H. Smith received \$137 for expenses, he has not yet been paid for his services; Sir Henry Drayton returned the check for \$15,000 sent him for his services. Twenty-three engineers were employed in connection with the work, receiving \$28,016.33 for their services, and \$3,854.15 for expenses.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The commission has suspended from October 1 to January 29, 1918, a proposed increase in the classification of automobile bodies in official classification territory.

The commission has suspended from September 27 until January 25 increased proportional commodity rates on bituminous coal from mines in Alabama and other states to New Orleans, La.; Memphis, Tenn.; Vicksburg, Miss., and Shreveport, La.

In response to requests, the commission has announced a hearing at Washington on October 22, at which it will hear from representatives of carriers and shippers with reference to rates on petroleum and its products in Central Freight Association territory, as affected by the 15 per cent case decision.

The Interstate Commerce Commission has issued an order indefinitely postponing the effective date of its order in the transcontinental rate case because compliance with the order would require the filing of tariffs increasing rates in some instances which under the amendment to the fifteenth section of the law require approval of the commission before they can be filed.

The commission has suspended from September 27 until January 25 increased class and commodity rates from Pacific Coast territory to Camp Bowie, Tex. Camp Bowie is located on the recently constructed spur of the Texas & Pacific, near Tremble, Tex. Group H rates apply to Texas points generally, including Tremble and Camp Bowie. The suspended items contain an exception to the basis for rates applicable to Texas points and provide that combination rates will apply to Camp Bowie, effective September 27.

The commission has suspended from September 28 until January 26 the withdrawal of joint through carload rates on petroleum and its products from various points in Oklahoma to interstate destinations located on or reached via the Atchison, Topeka & Santa Fe. The proposed cancellation of joint rates would result in substantial increases. For instance, the present rate from Sumpter, Okla., to Cairo, Ill., is 23 cents, and the proposed combination rate is 28 cents per 100 lbs. The present rate from the same point of origin to Austin, Tex., is 39, and the proposed class rate is 70 cents.

Hearing on Increased Rate Procedure

The Interstate Commerce Commission has announced a hearing at Washington on October 15 on a proposed tentative order outlining the form of procedure to be followed to comply with the amendment to section 15 of the commerce law, adopted on August 9, requiring that the approval of a proposed increased rate, fare, charge or classification must be secured before the tariff containing it is filed with the commission by the carrier. Since the law became effective requests of carriers for approval of tariffs have been accumulating in the commission's offices without a definite form of procedure having been adopted. The tentative order states that requests for such approval must be made by application to the commission in a prescribed form, giving detailed information regarding the nature and purpose of the proposed increase, with a complete and accurate statement of the reasons advanced in justification. If the application embraces a number of increases they may be shown in an exhibit for which a proof copy of the proposed tariff may be used with red ink insertions to show both the existing and proposed rates, or these may be shown in memorandum form. All of these requirements are set forth in full in the order. Five copies of each application should be presented, but where more than 20 pages are required, two copies of the exhibit will be accepted as sufficient.

The commission also expressed the view that carriers should consult freely with shippers who may be interested in proposed increases and suggested that the course now pursued by the

classification committees had resulted in a better understanding between shippers and carriers.

The commission has also outlined a publicity plan for apprising interested shippers of the applications for permission to file increased rates. One application containing copies of all exhibits will be open for consultation in the commission's public tariff room and notices will be laid daily upon the table in the press room.

Proposed Increases on Eastbound Grain

The commission has suspended, from October 1 and later dates until January 29, increased carload rates on grain, grain products and by-products of grain between points in Official Classification territory; also from St. Paul, Minn., and St. Paul rate points to eastern destinations. Present and proposed rates from Chicago, on grain, are:

		Rates in cents per 100 lbs.			
		Present.		Proposed.	
		Dom.	Export.	Dom.	Export.
To New York.....	Local	21.8	20.3	24.5	23.0
	Reshipping	16.8	15.3	19.5	18.0
To Philadelphia.....	Local	19.8	19.3	22.5	22.0
	Reshipping	14.8	14.3	17.5	17.0
To Baltimore.....	Local	18.8	18.8	21.5	21.5
	Reshipping	13.8	13.8	16.5	16.5
To Boston.....	Local	23.8	20.3	26.5	23.0
	Reshipping	18.8	15.3	21.5	18.0

On grain products (except flour) the rates are:

		Rates in cents per 100 lbs.			
		Present.		Proposed.	
		Dom.	Export.	Dom.	Export.
To New York.....	Local	22.5	22.5	25.0	25.0
	Reshipping	17.5	17.5	20.0	20.0
To Philadelphia.....	Local	20.5	20.5	23.0	23.0
	Reshipping	15.5	15.5	18.0	18.0
To Baltimore.....	Local	19.5	19.5	22.0	22.0
	Reshipping	14.5	14.5	17.0	17.0
To Boston.....	Local	24.5	22.5	27.0	25.0
	Reshipping	19.5	17.5	22.0	20.0

COURT NEWS

Care for Passenger Temporarily Leaving Train

The California Supreme Court holds that in the case of a passenger temporarily leaving a train during a stop, the railroad is held only to ordinary care and prudence in respect to such passenger. There is a difference in the danger involved and the opportunity and capacity to protect himself between the situation of a passenger while traveling on the train and while temporarily absent from it.—*Sellers v. S. P. (Cal.)*, 166 Pac., 559. Decided July 16, 1917.

Error in Bill of Lading

The Georgia Court of Appeals holds that when the agent of a railroad company receives for shipment a number of bales of cotton, weighs them, and inserts in the bill of lading the number of bales and their total weight; and the number of pounds inserted is in excess of the actual weight, and the shipper attaches to the bill of lading a draft which is paid by an innocent transferee, the railroad is bound by the error of its agent, unless the amount erroneously inserted in the bill of lading is so very large that the error would be apparent on its face.—*A. C. L. v. Luke (Ga.)*, 93 S. E., 286. Decided August 3, 1917.

Crossing Accident—Railroad Recovers from Street Car Company for Conductor's Negligence

Action was brought by a steam railroad company against a street car company for damages to its engine, cars, etc., in a collision between its train and the defendant's car at Binghamton, Tenn., about dusk, September 17, 1914. Previous suits by passengers in the street car had resulted in judgments against the street car company because of its conductor's negligence in signaling to the motorman to cross, although the smoke and steam of a passing train obscured his view in one direction. The steam railroad's trains had always had the right of way, and had been accustomed to proceed without slackening speed, while it had been the uniform custom for the street cars to come to a full stop, and for the conductor to go forward to ascertain whether

a train was approaching and then signal the motorman. The street car company had instructed its conductors to pursue this course. The Circuit Court of Appeals, Sixth Circuit, holds that the car conductor should have delayed signaling the motorman for a reasonable length of time to allow the smoke and dust to clear away. The street car company could not rely as a defense on the rate of speed of the train being contributory negligence. Judgment for the railroad company was affirmed.—*Memphis St. Ry. Co. v. Illinois Central*, 242 Fed., 617. Decided May 18, 1917.

Transportation of Intoxicating Liquors

An Arkansas act of 1917 makes it unlawful for any common carrier or its agent to ship intoxicants into the state, except for strictly medicinal or mechanical purposes. The Supreme Court of the State holds that when alcohol is shipped from a point out of the state and delivered by a common carrier to a person in the state, the common carrier's duty is to use reasonable care to learn for what purpose the liquor is to be used, and it can only deliver the alcohol when in the exercise of such care it is convinced that it is to be used for strictly medicinal or mechanical purposes. If it acts upon reasonable grounds and in good faith and is misled, it is not liable.—*Wells, Fargo & Co. v. State (Ark.)*, 197 S. W., 13. Decided July 2, 1917.

Excessive Damages

The Mississippi Supreme Court holds that where a flagman was killed, leaving his mother, 60 years of age, with a life expectancy of 14 years, to whom the flagman had contributed \$50 a month, a verdict of \$20,000 was excessive, and should be reduced to \$12,500, such amount including damages for pain and suffering.—*Yazoo & M. V. v. Mullins (Miss.)*, 76 So., 147. Decided July 2, 1917.

A verdict for \$15,000 was awarded the widow and minor children of a locomotive engineer for his death from a derailment, when he suffered much pain, before his death, from scalding. The award included \$5,000 for the deceased's physical pain and mental anguish and for awe of impending death. The Louisiana Supreme Court reduced the \$5,000 item to \$2,000.—*Barber v. Louisiana Ry. & Nav. (La.)*, 76 So., 199. Decided June 30, 1917.

Regulation of Interstate and Intrastate Rates

The Arkansas Supreme Court holds that where the Interstate Commerce Commission approved a carrier's interstate rates, but ordered it not to discriminate against interstate traffic by charging it more than one cent above the rate for certain intrastate shipments, the carrier might remove the discrimination by advancing the intrastate rates to within one cent of the interstate rates, although a state statute prescribed lower rates. In so holding the court followed *Houston, East & West Texas v. United States*, 234 U. S., 342 (the Shreveport Case), and *State v. American Express Co.*, 37 U. S. Sup. Ct., 656, reversing a decision of the Supreme Court of South Dakota. It was said in the *American Express Case*: "The Supreme Court of South Dakota declares: 'If the purported order of the [Interstate Commerce] Commission does, in any respect, regulate intrastate commerce, it is to that extent void, owing to the commission's want of jurisdiction over the subject-matter.' That court denies not only the intent of Congress to confer upon the commission authority to remove an existing discrimination against interstate commerce by directing a change of an intrastate rate prescribed by state authority, but denies also the power of Congress under the Constitution to confer such power upon the commission or to exercise it directly. The existence of such power and authority should not have been questioned since the decision of this court in the Shreveport Case.

It is also urged that, even if the commission had power, under the circumstances, to order a change of the intrastate rates, the order in question was invalid because the commission, instead of specifically directing the change, undertook to give the carrier a discretion as to how it should be done and as to the territory to which it should apply. The order properly left to the carrier's discretion to determine how the discrimination should be removed; that is, whether by lowering the interstate rates or by raising the intrastate rates, or by doing both. In its general form the order is identical with that under consideration in the *Shreveport Case*."—*St. Louis, Iron Mountain & Southern v. State*, 197 S. W., 1. Decided July 9, 1917.

Equipment and Supplies

LOCOMOTIVES

ILLINOIS CENTRAL will shortly issue inquiries for 85 locomotives.

RUSSIAN GOVERNMENT.—Reports have it that orders for 750 locomotives to the Baldwin Locomotive Works, and a like number to the American Locomotive Company are about to be placed.

BLISS DALLET & COMPANY have ordered one six-wheel locomotive (060-T-52) from the American Locomotive Company. This locomotive will have 11 by 16 in. cylinders and a total weight in working order of 52,000 lb.

THE SHANTUNG RAILWAY has ordered two Consolidation type locomotives (280-S-160) from the American Locomotive Company. These locomotives will have 20½ by 26 in. cylinders and a total weight in working order of 160,000 lb.

UNITED STATES GOVERNMENT.—The Committee on Public Information, in a story given out Thursday describing the Consolidation locomotives now being built for our forces overseas, makes the statement that "additional orders for both narrow and standard gage equipment are likely."

FREIGHT CARS

THE CENTRAL OF GEORGIA is inquiring for 500 steel underframes.

ILLINOIS CENTRAL will shortly issue inquiries for 3,500 freight cars.

THE ELGIN, JOLIET & EASTERN will build a number of drop bottom gondola cars at their own shops.

THE MARION & EASTERN, Marion, Ill., advises that it is in the market for 1,000 all-steel coal cars.

THOMAS RUDBY, Kansas City, Kan., is inquiring for from 50 to 100 steel underframe, 30-ton refrigerator cars.

WESTERN MARYLAND.—The report in last week's issue to the effect that this company is asking prices on 1,000 freight cars has been denied.

PASSENGER CARS

THE ILLINOIS CENTRAL will shortly issue inquiries for 60 passenger cars.

THE ANTIOQUIA COMMERCIAL CORPORATION of Antioquia, Colombia, has ordered 6 first class and 11 second class coaches from the American Car & Foundry Company for the Ferrocarril del Pacifico.

U. S. COPPER OUTPUT.—A statement issued by the National City Bank, New York, shows the world's copper production, which totaled less than 100,000 tons in 1850 and 130,000 in 1860, was 272,000 in 1890, 496,000 in 1900, 850,000 in 1910, 1,000,000 in 1913, and 1,400,000 in 1916. The United States' share of the world total was 55 per cent in 1913 and 63 per cent in 1916. World production increased approximately 40 per cent in the three-year period 1913-16; that of the United States about 60 per cent.

AUSTRALIAN RAILWAY AFFAIRS.—In Perth a large and representative committee has formulated a scheme for holding a post-war exposition to celebrate the opening of the Trans-Australian Railway. It is suggested that the exposition should remain open for from 12 to 16 weeks, and among the loan exhibits recommended are the presents received by the late King Edward, a model of Queen Alexandra's dairy farm at Sandringham, a collection of famous portraits and memorial scenes in British history, exhibits from the Admiralty, War Office, Trinity House, City of London and British Museum. It is estimated the cost of the exposition would be about £125,000 (\$607,500), and the income £70,000 (\$340,200).

Supply Trade News

Edward F. Carry, president of the Haskell & Barker Car Company, Chicago, has been appointed director of the shipping board of the government, with headquarters at Washington, D. C. Mr. Carry will not sever his connection with the Haskell & Barker Car Company.

John E. Woods, formerly manager of sales of the Carnegie Steel Company, the Illinois Steel Company and the Tennessee Coal, Iron & Railroad Company, at Cincinnati, Ohio, has been appointed assistant general manager of sales, with offices in the Carnegie building, Pittsburgh, effective September 15. Mr. Woods succeeds John W. Dix, deceased.

The United States Switch Company, Eau Claire, Wis., has been incorporated for \$1,750,000 to manufacture the Shepherd automatic railway switch, the Hubbard automatic railway switch, the Shepherd automatic street car switch and other railway appliances. This company has purchased a site and factory buildings at Eau Claire, and plans to construct other buildings at once.

The Union Carbide & Carbon Corporation has been organized in New York with a capital of 3,000,000 shares without stated par value. The new organization proposes to absorb the Union Carbide Company, the National Carbon Company, the Prest-O-Lite Company, and the Linde Air Products Company. Stockowners of the Union Carbide Company are offered two and one-half shares of the corporation for each share of their present holdings, while two shares of new stock will be given for each Prest-O-Lite share, and three and one-quarter shares for each Linde Air Products share. Myron T. Herriek is to be chairman of the corporation's Board of Directors and George O. Knapp, president of the Union Carbide Company, is to be president. The directorate, besides these officers, will consist of C. K. G. Billings, Charles A. Coffin, Jesse J. Kicks, Andrew Squire, Nicholas F. Brady, G. W. Davidson, Conrad Hubert, James Parmelee, Roger C. Sullivan, F. C. Walcott, and James N. Wallace.

Railway Construction

CHICAGO, MILWAUKEE & ST. PAUL.—This company recently awarded a contract to C. Matson & Son, Tacoma, Wash., for the construction of a 5½-mile spur from Greendale, Wash., to American Lake, where the cantonment, Camp Lewis, is located. The work will cost about \$80,000.

ILLINOIS CENTRAL.—This road is preparing plans for a combination freight and passenger station at Litchfield, Ill. The building will be a one-story structure, 120 ft. by 30 ft., with brick walls and tile roof, and will cost about \$35,000.

The company will also build a store and oil house at Jackson, Tenn., which will cost about \$50,000. The building will be of irregular shape, the larger part of which will be 37 ft. by 175 ft., one story high, and the remainder 37 ft. by 72 ft. and two stories high. Offices for the master mechanic will be provided in the second story, and oil tanks for the storage of oil will be provided in the basement. The building will have brick walls and a slate roof.

A contract has been awarded to Joseph E. Nelson & Sons, Chicago, for the construction of mechanical facilities at Mattoon, Ill., which will cost in the neighborhood of \$100,000. Among the new facilities which will be provided will be a 14-stall roundhouse.

A contract has been awarded to George B. Swift & Co., Chicago, for the erection of mechanical facilities at Kankakee, Ill., to cost about \$100,000. The improvements will include a 9-stall roundhouse and an 85-ft. turntable.

Contracts have been awarded to the Gould Construction Company and the Walsh Construction Company, Davenport, Iowa, for the construction of a four-track, 570-ft. concrete bridge at Kankakee, Ill., to cost about \$100,000. (September 7, p. 441.)

Railway Financial News

BOSTON & MAINE.—Stockholders of the Fitchburg Railroad, which is leased to the Boston & Maine, have voted to authorize an issue of \$3,700,000 bonds to provide for the payment of floating debt amounting to \$2,609,000, and to reimburse the Boston & Maine for expenditures for additions and betterments. This bond issue is to take the place of the bond issue of \$3,300,000 which was previously authorized but under which authorization no bonds were sold.

CHICAGO, ROCK ISLAND & PACIFIC.—The directors have sent out the usual call for proxies for the annual meeting of stockholders to take place October 11, but have substituted the name of A. C. Rearick for that of N. L. Amster. N. L. Amster is the chairman of the executive committee and represented certain stockholders in the reorganization who were opposed to a foreclosure sale of the property. A. C. Rearick represents \$11,400,000 stock of the Chicago, Rock Island & Pacific owned in Holland. All eight of the directors other than Mr. Amster who were present at the directors' meeting joined in sending out a statement accompanying the call for proxies which contains the following:

"The unwarranted and misleading communication recently sent to the stockholders by Nathan L. Amster, a director of your company, with design to create in the minds of stockholders the dissatisfaction of the conduct of the affairs of your company which in the opinion of the board of directors the facts do not justify, and we deem it our duty to send this statement to the stockholders in order that you may not be misled to an unwise use of your vote at the forthcoming election of directors.

"The company has passed through many trials and vicissitudes, and it has been hoped by the officers and members of the board of directors of your company that these were all past and that the united effort for the success of the company could now be had. No shareholder can possibly regret more than the members of the board the undignified controversy which Mr. Amster has started and which it has been deemed proper to notice. Each stockholder must determine for himself whether he prefers to favor the proposed board of directors named, for which it is the intention of the proxy committee to vote, or to give their proxies to Mr. Amster to vote for men of his selection as yet unnamed."

The company has asked permission from the Public Utilities Commission of Illinois to issue \$12,482,000 bonds, of which \$1,000,000 is to be general mortgage bonds and the balance first and refunding mortgage bonds.

DENVER & RIO GRANDE.—The stockholders' protective committee, of which John W. Platten is chairman, is asking stockholders for proxies to be voted on October 16 at the annual meeting. The committee proposes to elect Mr. Platten, J. Horace Harding and Harry Bronner as directors, to succeed Kingdon Gould, Benjamin B. McAlpin and H. U. Mudge. The committee was formed after the United States district court had granted a judgment against the Denver & Rio Grande for \$32,000,000 for default of its guarantee of interest on the Western Pacific first mortgage bonds.

HANNIBAL & ST. LOUIS.—The Public Service Commission of Missouri has approved of a reorganization plan for this road which reduces the total capitalization from \$1,835,000 to \$632,000. Under the reorganization there will be \$250,000 preferred and \$370,000 common stock, no bonds, and \$12,000 notes payable.

LEAVENWORTH & TOPEKA.—This road, extending from Leavenworth, Kan., to Topeka, and about 50 miles in length, was recently sold by its joint owners, the Atchison, Topeka & Santa Fe and the Union Pacific, to Chicago interests headed by F. I. Wells, who has been elected president of the road.

NEW YORK CENTRAL.—A syndicate headed by J. P. Morgan & Co. and the National City Company will offer the \$15,000,000 2-year 5 per cent notes, probably on a 6½ per cent basis. The

notes are secured by \$20,000,000 refunding and improvement 4½s.

NEW YORK, NEW HAVEN & HARTFORD.—Official circulars have been sent to stockholders by the directors giving notice that the stockholders will be asked at a special meeting to be held following the regular annual meeting to authorize \$45,000,000 preferred stock.

NEW YORK, ONTARIO & WESTERN.—E. J. Pearson, president of the New York, New Haven & Hartford, has been elected a director of the New York, Ontario & Western, succeeding R. D. Rickard, resigned.

TENNESSEE CENTRAL.—Counsel for the Mississippi Valley Trust Company, the Illinois Central, and the Southern Railway will present a petition to Judge E. T. Sanford, of the United States District Court at Nashville, on the beginning of the term of the court on October 1, seeking an order requiring the receivers of the Tennessee Central to permit the petitioners to have an expert examination made of the books and records of the receivership in order that they may have an opportunity to properly prepare their defense to the petition of the Fourth and First National banks and the First Savings Bank & Trust Company, trustee, against the Tennessee Central. These latter companies recently filed a petition in the federal court seeking to have the receivers' certificates held by the institutions made superior to the first mortgage bonds, held by the Illinois Central and the Southern.

WEBBERS FALLS RAILROAD.—A press despatch says that this road, running from Webbers Falls to Warner, 10 miles, has been sold for \$35,000 to the Muskogee Junk & Supply Company. The tracks, it is said, are to be taken up and sold.

EUROPEAN WATER TRANSPORTATION COSTLY.—Water transportation in Europe is more expensive than rail transportation. For 1905, for instance, the waterways of Prussia showed a deficit of \$3,523 a mile, while the railways yielded a net profit of \$1,814 for every mile. The Prussian government, consequently, uses the railroad profits to offset the waterway deficit.

CONTEMPLATED INCREASE IN ARGENTINE FREIGHT RATES.—The privately owned railways of the Rosario district in conjunction with other lines have given notice to the Federal Railway Commission of a contemplated increase of 22 per cent in all their tariffs to take effect December 15, 1917. An increase of 10 per cent in rates went into effect October 1, 1915. Freight rates in the district average between 1.4 and 1.8 cents per ton-mile.

INCREASED FREIGHT TRAFFIC IN GREAT BRITAIN.—The president of the British Board of Trade was recently asked in the House whether there had been any increase of freight traffic on the railways since the government took over control, notwithstanding the depleted plant; and could he give any comparative figures of 1913 and 1914, and of 1915, 1916 and 1917 of the freight traffic on British railways. To this question G. Roberts replied that there had unquestionably been a very considerable increase of freight traffic on British railways since the government took control, but he was not in a position to furnish figures, inasmuch as large quantities of naval and military traffic had been carried on which no charges were recorded.

CASUALTY LIST OF A BRITISH RAILROAD.—The Earl of Bessborough, K. P., chairman of the London, Brighton & South Coast, addressing the company's staff on August 4, last, said: "I have just got the figures of the men in our service who are away. The total number of men who have left for active service is 4,529. Roughly speaking, the percentage of the whole staff is about 28 per cent. Of these 277 have fallen in action, 330 have been wounded, 28 are prisoners and 23 are missing, and we are glad to think that up to today 30 of our men have received decorations. Now may I ask you, with bowed heads, solemnly to salute those who are gone and have given their lives in the sacred cause, a cause which, as you are well aware, is for the liberty of Europe, if not for the whole world. Also at the same time may I ask you individually and collectively as those associated, as we all are with our railway, solemnly to resolve that you will do everything in your power to bring this war to a successful conclusion? We must ensure that all who have gone shall not be hindered and that their great sacrifice shall not be made in vain."

Railway Officers

Executive, Financial, Legal and Accounting

L. R. Deevers, assistant auditor of the Wheeling & Lake Erie, at Cleveland, Ohio, has been appointed acting auditor, vice C. H. Holmes, temporarily absent on account of illness.

Conrad E. Spens, assistant freight traffic manager of the Chicago, Burlington & Quincy, has been elected vice-president in charge of traffic, succeeding C. G. Burnham, promoted. Mr. Spens was born at Princeton, Ill., on August 14, 1875, and has been connected with the Burlington since 1892, when he became a stenographer in the local freight office at Chicago. In the same year he was transferred to the general freight office as correspondence clerk, and subsequently was chief clerk to the assistant general freight agent, and chief clerk to the traffic manager. On April 1, 1903, Mr. Spens was appointed assistant general freight agent at Chicago, and on August 1, 1905, he was promoted to general freight agent of the lines west of the Missouri river. On December 1, 1912, he was appointed assistant freight traffic manager of the Burlington system, with headquarters at Chicago, and continued in that position until October 1, 1917.

James R. Kearney, general superintendent of transportation of the Baltimore & Ohio, at Baltimore, Md., has been promoted to assistant to vice-president, with headquarters at Baltimore. He was born on March 29, 1859, and was educated in the common schools at Altoona, Pa. In 1876 he began railway work as a clerk in the car record office of the Pennsylvania Railroad, at Altoona. From March, 1880, to May of the following year, he served in the car record office of the Illinois Central, and then to November, 1881, was car accountant of the Illinois Midland, now a part of the Pittsburgh, Cincinnati, Chicago & St. Louis. He then returned to the car record office of the Illinois Central, remaining in that position until May 10, 1882, and subsequently to May 1, 1889, was successively clerk and chief clerk of the car record office of the St. Paul, Minneapolis & Manitoba and its successor, the Great Northern, at St. Paul, Minn. In May, 1889, he entered the service of the Baltimore & Ohio as superintendent of car service. On September 20, 1910, he was promoted to superintendent of transportation, and in July, 1914, was appointed general superintendent of transportation, at Baltimore, Md., which position he held until his recent appointment as assistant to vice-president, as above noted.



C. E. Spens



J. R. Kearney

F. L. Wells has been elected president and J. Isherwood secretary and treasurer of the Leavenworth & Topeka, a recently reorganized line, formerly controlled jointly by the Union Pacific and the Atchison, Topeka & Santa Fe. The company's headquarters are at Leavenworth, Kan.

Benjamin Brinton Greer, whose election as vice-president and general manager of the Colorado & Southern, was announced in the *Railway Age Gazette* of September 21, was born at Chicago on August 6, 1877.



B. B. Greer

He began his business career with the Pullman Company in the summer of 1899, and a few months later entered the service of the Great Northern at St. Paul, Minn., as a clerk in the accounting department, following which he was successively material clerk in the superintendent's office, extra gang foreman, assistant roadmaster, chief clerk to the division superintendent and assistant superintendent, with headquarters at Minneapolis. On December 15, 1908, he left the Great Northern to become transportation inspector on the Chicago, Burlington & Quincy, at Chicago, and on September 10, 1910, was promoted to superintendent of the St. Louis terminals. On May 1, 1911, he became superintendent of the Hannibal division, and on January 1, 1912, was transferred to the St. Joseph division. On July 1, 1913, he was promoted to assistant to the general manager of the lines east of the Missouri river, with headquarters at Chicago, and on January 15, 1914, became assistant general manager of the lines east. On March 1, 1915, he was transferred to the lines west, with headquarters at Omaha, Neb., and on July 1, 1916, became assistant to the vice-president in charge of operation, in which capacity he served until his election, as above noted.

E. P. Bracken, general manager of lines east of the Missouri river, of the Chicago, Burlington & Quincy, with headquarters at Chicago, has been elected vice-president in charge of the operating department, succeeding H. E. Byram, resigned to become president of the Chicago, Milwaukee & St. Paul. Mr. Bracken entered railway service in August, 1887, as a gang foreman on the Lincoln division of the Burlington. From September, 1888, to November, 1905, he was consecutively extra gang foreman on the Wymore division for one year, roadmaster for 13 years and trainmaster for three years. From November, 1905, to April, 1906, he was assistant superintendent of the Lincoln division, and from the latter date until May 15,



E. P. Bracken

1909, he was successively superintendent of the Lincoln, Sterling, Sheridan, Brookfield and Galesburg divisions. In the following year he was general superintendent of the Wyoming district, and from February, 1910, until August, 1912, was assistant general manager of the lines east of the Missouri river, with headquarters at Chicago. Since 1912 he has been general manager of the lines east. As vice-president, in charge of operation, he will continue to have headquarters at Chicago.

Claude G. Burnham, vice-president in charge of traffic of the Chicago, Burlington & Quincy, has been promoted to vice-president of the executive department, a newly created office, the duties of which will be to assist the president in the administration of all departments of the company's service. Mr. Burnham will continue to have headquarters at Chicago, Ill.

Operating

H. B. Voorhees, general superintendent of the Northwestern district at Cincinnati, Ohio, has been appointed general superintendent of transportation of the Baltimore & Ohio, with office at Baltimore, Md.

F. Wear, trainmaster of the Great Northern at Melrose, Minn., has been promoted to superintendent of the Butte division, with headquarters at Great Falls, Mont., succeeding G. E. Votaw, resigned to enter the service of another company, effective October 1.

W. L. Booth, general superintendent of transportation of the Chesapeake & Ohio at Richmond, Va., has been appointed assistant general manager, effective October 1, and his former position has been abolished. A sketch of Mr. Booth's railway career was published in the *Railway Age Gazette* of July 6, 1917, page 46.

John R. Stemm, whose appointment as superintendent of the northern division of the Chicago, Indianapolis & Louisville, with headquarters at Lafayette, Ind., was announced in the *Railway*



J. R. Stemm

Age Gazette on September 14, was born at Wooster, Ohio, on July 27, 1869. His first railroad experience was as an operator at Rochester, Ind., on the Chicago & Atlantic, now the Chicago division of the Erie. From November, 1889, to 1891, he was copy operator in a dispatcher's office on the New York, Pennsylvania & Ohio, now the Erie. From the latter date until May, 1892, he was dispatcher on the same road, following which he was employed in the general offices of the Louisville & Nashville at Louisville, Ky. On November 8, 1892, he was appointed operator of the Louisville, New Albany & Chicago, now the Chicago, Indianapolis & Louisville, at Bloomington, Ind. He was promoted to dispatcher in 1897, to night chief dispatcher in July, 1905, to day chief dispatcher of the southern division in July, 1906, and to trainmaster on the southern division in January, 1913. He was transferred to the northern division in February, 1915, and on September 7, 1917, he was promoted to superintendent of this division, succeeding W. H. Fogg, promoted.

G. Marks freight claim agent of the New York, New Haven & Hartford at Boston, Mass., is to have charge of a new department to be organized to improve the service at freight stations, with headquarters at New Haven, Conn., and G. L. Winlock, auditor of overcharge claims, at Boston, Mass., will have charge also of the freight claim office.

A. G. Smart, division superintendent of the Chicago, Burlington & Quincy at Beardstown, Ill., has been appointed general superintendent of the Nebraska district, with headquarters at Lincoln, Neb., to succeed L. B. Lyman, promoted. W. A. Chittenden, division superintendent at Brookfield, Mo., has been transferred to Beardstown, Ill., to succeed Mr. Smart.

W. F. Giles, assistant superintendent of the Chicago, Burlington & Quincy at Brookfield, Mo., has been promoted to superintendent, succeeding W. A. Chittenden, transferred. H. E. Ruggles, trainmaster at Chicago, has been appointed assistant superintendent of the Chicago division, succeeding H. T. Murray, who has been appointed general yardmaster at Galesburg, Ill.; W. J.

Meyers, assistant trainmaster at Chicago, has been appointed trainmaster, succeeding Mr. Ruggles.

H. C. Oviatt, general superintendent of the Lines West of the New York, New Haven & Hartford at New Haven, Conn., has resigned to go to another company. W. H. Foster, superintendent of the New Haven division at New Haven, has been appointed general superintendent, Lines West, succeeding Mr. Oviatt. F. S. Hobbs, superintendent of the Boston division at Boston, Mass., has been transferred as superintendent to the New Haven division. W. T. Spencer, superintendent of the Old Colony division at Taunton, Mass., has been transferred as superintendent to the Boston division, and F. M. Clark, freight assistant, superintendent of transportation, has been appointed superintendent of the Old Colony division.

E. W. Scheer, general superintendent of the Southwestern district of the Baltimore & Ohio, at Cincinnati, Ohio, has been promoted to general superintendent of the Northwestern district, with headquarters at Cincinnati; F. B. Mitchell, superintendent of the Toledo division at Dayton, Ohio, succeeds Mr. Scheer; Ross B. Mann, superintendent of the Indiana division at Seymour, Ind., succeeds Mr. Mitchell; G. S. Cameron, assistant superintendent of the Ohio division, at Chillicothe, Ohio, has been promoted to superintendent of the Indiana division, succeeding Mr. Mann, and R. W. Brown, trainmaster of the Toledo division, has been promoted to assistant superintendent of the Ohio division, with headquarters at Chillicothe, succeeding Mr. Cameron.

James Buckelew, who has been appointed superintendent of the Maryland division of the Philadelphia, Baltimore & Washington, with headquarters at Wilmington, Del., as has already been announced in these columns, was born on October 7, 1864, at Jamesburg, N. J., and entered the service of the Pennsylvania Railroad on July 23, 1885, as a rodman in the engineering department. He was later transferred to the maintenance of way department, and in May, 1888, was appointed assistant supervisor, and on April 14, 1890, was promoted to supervisor. In January, 1900, he was appointed assistant engineer of the Renovo division, and the following January was transferred in the same capacity to the Tyrone division, and one year later was again transferred in the same capacity to the Pittsburgh division. He was appointed principal assistant engineer of the Philadelphia, Baltimore & Washington on June 1, 1903, and in January, 1906, was appointed superintendent of the Central division. In April, 1907, he was transferred in the same capacity to the Allegheny division of the Pennsylvania Railroad, and on January 1, 1912, was appointed superintendent of the Camden Terminal division and the West Jersey & Seashore, which position he held until his appointment as superintendent of the Maryland division of the Philadelphia, Baltimore & Washington, as above noted.

Arthur H. Slader, chief clerk to the general manager of the Boston & Maine, at Boston, Mass., has been appointed assistant to the general manager; H. C. Robinson, superintendent of the Southern division, at Concord, N. H., has been appointed superintendent of outside operations; W. R. Mooney, superintendent of the Worcester, Nashua and Portland division, at Nashua, N. H., has been appointed superintendent of the Southern division; W. H. Ford, assistant superintendent of the Connecticut & Passumpsic division, at Springfield, Mass., has been appointed superintendent of the Worcester, Nashua & Portland division; C. M. Woodward, trainmaster on the Connecticut & Passumpsic division, has been appointed assistant superintendent of the same division, and H. G. Spaulding, trainmaster on the White Moun-

tains division, has been appointed assistant superintendent of that division.

Louis Baker Allen, assistant general manager, lines east of the Missouri River, of the Chicago, Burlington & Quincy, has been promoted to general manager of the lines east of the Missouri river, with headquarters at Chicago, effective October 1. Mr. Allen was born at Austin, Minn., on August 19, 1868, and entered railroad service in 1880 as a messenger with the Chicago, Milwaukee & St. Paul. He remained in the employ of that company in station, yard and train service until 1889, when he became secretary and chief clerk to the general superintendent of the Minnesota Transfer. From 1893 to 1898, he was with the Great Northern as stenographer and car distributor for the general superintendent. In 1898



L. B. Allen

he was appointed assistant division superintendent on the Great Northern and in the following year was promoted to division superintendent. He entered the service of the Chicago, Rock Island & Pacific on October 10, 1903, as a division superintendent and left that road on February 1, 1906, to become superintendent of the Ottumwa division of the Burlington. He was promoted to general superintendent of the Wyoming district on July 23, 1906, and was transferred as general superintendent to the Iowa district on May 15, 1909. On September 19, 1910, he became general superintendent of the Nebraska district, following which he was promoted to assistant general manager, lines east of the Missouri river, on March 1, 1915. He continued in that position with headquarters at Chicago, until October 1, 1917, when he was appointed general manager lines east of the Missouri river.

Lewis B. Lyman, general superintendent of the Nebraska district of the Chicago, Burlington & Quincy, has been promoted to assistant general manager of the lines east of the Missouri river, with headquarters at Chicago, succeeding L. B. Allen, promoted. Mr. Lyman was born at Dunlap, Iowa, on November 2, 1878, and entered railway service with the Burlington on November 2, 1898, as a brakeman. From October, 1900, to August, 1904, he was a conductor on the same road, and from the latter date to July, 1905, train dispatcher. In the following year he was again a conductor and on August, 1906, was appointed trainmaster. From March, 1908, to July, 1916, he was superintendent on various divisions, following which he was general superintendent of the Nebraska district, with headquarters at Lincoln, Neb. On October 1, 1917, he was appointed assistant general manager of the lines east of the Missouri river.



L. B. Lyman

Traffic

C. E. Dempsey has been appointed chief of the tariff bureau of the Wheeling & Lake Erie, with office at Cleveland, Ohio.

James Finlay, traveling freight agent of the Michigan Central

at Detroit, Mich., has been promoted to commercial agent at Battle Creek.

L. E. Ayer, commercial agent of the Canadian Northern at St. Louis, Mo., has been appointed general agent, with the same headquarters, and will have supervision over passenger and freight matters.

S. A. Williams, general agent of the traffic department of the Chicago & Alton at Peoria, Ill., has been transferred to St. Louis, Mo., where he will have charge of operation and traffic in the St. Louis and East St. Louis districts.

Oliver T. Boyd, whose appointment as general passenger agent of the Pennsylvania Lines East of Pittsburgh and Erie has already been announced in these columns, was born October 29,

1878, in Philadelphia, Pa. He entered the services of the Pennsylvania Railroad in December, 1897, as clerk in the advertising department. On June 1, 1901, he was given charge of the special excursion department, and in July, 1903, he was promoted to chief clerk to the assistant general passenger agent, remaining in that position until May, 1906, when he was appointed city passenger agent at Washington, D. C. In June, 1909, he was granted leave of absence to enter the service of the Hudson & Manhattan, in New York City, as general passenger agent. He remained with that company until September 15, 1912, when he returned to the service of the Pennsylvania Railroad as district passenger agent at Pittsburgh, Pa. In March, 1913, when the passenger department of the Pennsylvania Lines East of Pittsburgh and Erie was reorganized, Mr. Boyd was promoted to division passenger agent at New York, which position he held until his appointment as general passenger agent, with headquarters at Philadelphia, Pa., of the same road, as above noted.

C. W. Galligan, assistant freight traffic manager of the Chicago & Alton at Chicago, has been promoted to freight traffic manager in the headquarters at Chicago and his former title has been abolished.

C. H. Rupert has been appointed general baggage agent of the Chicago Great Western, with headquarters at Chicago, Ill., succeeding E. R. Reynolds, who has been commissioned a captain in the National Army, and is now stationed at Camp Grant, Ill.

Carl R. Maier, whose appointment as assistant general freight agent of the Chicago, Rock Island & Pacific at Chicago was announced in the *Railway Age Gazette* of September 28, was born at Topeka, Kan., on November 18, 1881. He first entered railway service on January 1, 1898, as an office boy in the general freight office of the Rock Island at Topeka. On July 1, 1902, he went to the general freight office at Chicago as a tariff clerk and subsequently held various clerical positions in the tariff department until September, 1915, when he was made chief clerk in charge of divisions. On September 13, 1917, he was promoted to assistant general freight agent in charge of the tariff bureau.

James Webster, whose appointment as freight traffic manager of the New York Central lines west of Buffalo, with headquarters at Chicago, was announced in the *Railway Age Gazette* on September 14, was born near Owen Sound, Ont., on December 14, 1856, and entered railway service in 1874 as a telegraph operator with the Toronto, Grey & Bruce Railway, now a part of the Canadian Pacific. In 1880 he became a stenographer on the Great Western of Canada, now a part of the Grand Trunk, and in 1882 entered the service of the New York, Chicago & St. Louis as a rate clerk, and later served successively until July 1, 1904, as chief clerk, commercial agent and assistant

general freight agent. On the latter date he was promoted to general freight agent, and in January, 1911, became assistant freight traffic manager of the New York Central lines west of Buffalo, with headquarters at Chicago, in which capacity he served until his recent appointment.

F. O. Stafford, whose appointment as manager of the New York Central Fast Freight Lines, with headquarters at Chicago, was announced in the *Railway Age Gazette* on September 14, was born in Canada. He began his railway service with the Merchants' Despatch Transportation Company as a clerk in the offices at Sioux City, Iowa, in April, 1899, and was later promoted to traveling agent. In 1901 he became assistant agent at Kansas City, Mo., and in January, 1904, was promoted to commercial agent, with headquarters at Des Moines, Iowa. In August, 1906, he was appointed assistant agent at St. Louis, Mo., and in March, 1910, became westbound and dairy agent of the New York Central Fast Freight Lines, with the same headquarters. In January, 1911, he was promoted to general westbound agent, with headquarters at Chicago, in which capacity he served until his recent promotion to manager.

Preston Graham Findlay, whose appointment as general freight agent of the Michigan Central, with headquarters at Detroit, Mich., was announced in the *Railway Age Gazette* of September 14, was born at Waterford, Ont., on May 20, 1878. He entered railway service on October 1, 1895, with the Erie, with which road he remained until November 30, 1897, as stenographer, clerk and chief clerk in the motive power department and in the superintendent's office at Buffalo, N. Y. From December, 1897, to May, 1898, he was clerk in the traffic department of the Pennsylvania Railroad at Buffalo, and from the latter date until September 30, 1906, was chief clerk to the division freight agent of the New York Central at Buffalo. He was then transferred to New York City as chief clerk to the general freight agent of the latter road, and was chief clerk to the manager of the New York Central Fast Freight Lines at Buffalo from December 1, 1907, to July 15, 1911, when he was promoted to assistant to the manager at Chicago. He held the latter position until August 15, 1917, at which time he was appointed general freight agent of the Michigan Central.

Carl Howe, whose appointment as traffic manager of the Michigan Central was announced in the *Railway Age Gazette* of September 14, was born at Niles, Mich., on January 11, 1870, and entered railway service as a clerk in the local freight office of the Michigan Central at Michigan City, Ind., on October 18, 1889. From that time until April 10, 1893, he held various clerkships on the same road. On the latter date he was transferred to Chicago Heights, Ill., as local agent. He remained in that position a little over a year, following which he was made traveling freight agent, with headquarters at Chicago. From May 1, 1898, to October 1, 1899, he was assistant chief clerk in the office of the general freight



Carl Howe

traffic manager, and from the latter date until July 1, 1900, chief clerk in the same office. During the ensuing seven years he was assistant general freight agent, and in January, 1907, was appointed traffic manager of the Merchants' Despatch Transportation Company, with headquarters at New York. In November of the same year he was appointed manager of the New York Central Fast Freight Lines, which was a merger of the Merchants' Despatch and various other fast freight lines operating over the New York Central. He continued to hold that position, with headquarters at Chicago, until his recent appointment to traffic manager of the Michigan Central, with headquarters in the same city.

Engineering and Rolling Stock

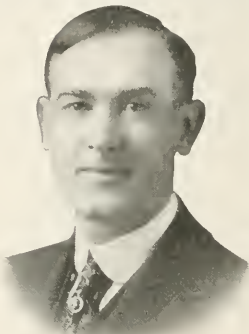
S. Buffington has been appointed resident engineer of the Kansas City, Mexico & Orient, to take the place of H. B. Holmes, chief engineer, resigned to become associated with Coverdale & Colpitts, New York.

A. N. Reece, office engineer of the Kansas City Southern and the Arkansas Western, has been promoted to division engineer of those roads, with headquarters at Pittsburg, Kan., succeeding G. H. Cook, resigned, effective October 1.

L. S. Kinnaird, master mechanic on the Pennsylvania Lines at Logansport, Ind., has been appointed superintendent of motive power of the Chicago & Eastern Illinois, with headquarters at Danville, Ill., succeeding J. E. Epler, resigned, effective October 1.

Victor U. Powell, master mechanic of the Illinois Central at Freeport, Ill., has been transferred to the Chicago Terminal and Illinois division, with office at Burnside shops, Chicago, succeeding Henry C. Eich, resigned to enter the service of another company, effective October 1.

Herbert G. Morgan, whose appointment as signal engineer of the Illinois Central was announced in the *Railway Age Gazette* on September 28, was born in Huntington, Ind., in 1883. He was educated in the public and high schools of that place and later completed a course in electrical engineering in Purdue University, graduating in 1904. His first technical experience was with the Bell Telephone Company, where he occupied the position of service inspector for three years. In 1907, he entered the drafting room in the signal department of the Illinois Central, where he remained for two years, later going to the Chicago & North Western as chief draftsman in the signal department for one year. He was then appointed assistant engineer for the General Railway Signal Company at Rochester, N. Y., and remained in that place for three years. In 1913, he returned to the Illinois Central as office engineer in the signal department, and in 1914 he was transferred to the valuation department as pilot signal engineer, from which he was promoted to signal engineer, effective September 16, as noted above.



H. G. Morgan

F. N. Hibbits, who resigned as superintendent of motive power of the Lehigh Valley in 1915, to go to the Baldwin Locomotive Works as assistant general superintendent, has returned to the service of the Lehigh Valley, as superintendent of motive power succeeding H. C. May, resigned to go to another company.

Purchasing

W. E. Steen, storekeeper of the Baltimore & Ohio, at Washington, Ind., has been appointed district storekeeper, with jurisdiction over the Southwest district, and H. Shoemaker, district storekeeper at Cincinnati, will in future have jurisdiction over the Northwest district and Chicago terminals.

Railway Officers in Military Service

H. J. Slifer, formerly general manager of the Chicago Great Western, has been commissioned major of the Twenty-first Engineers, a new railway regiment being recruited at Rockford, Ill.

W. K. Adams, formerly bridge engineer of the National Railway of Mexico, has been commissioned captain in the Engineer Officers Reserve Corps U. S. Army, and has been assigned to duty with the 21st Regiment of light railway men at Rockford, Ill.

Thomas Ryan, formerly general freight agent of the Mexican Central at Mexico City, Mex., and afterwards operating manager of the Brazilian railways, has been commissioned a major in the Twenty-first Railway Engineers, now at Rockford, Ill.

Special

W. H. Howard, who has been elected chairman of the Southeastern Passenger Association, with headquarters at Atlanta, Ga., as has already been announced in these columns, entered the service of the Southern Railway in May, 1899, as a stenographer in the office of S. H. Hardwick, assistant general passenger agent at Atlanta. Mr. Howard was transferred to Washington on January 1, 1901, as private secretary to Mr. Hardwick, who, on that date, became general passenger agent of the same road. In April of the following year Mr. Howard returned to Atlanta and was appointed assistant secretary of the Southeastern Passenger Association. He was made secretary of that association in November, 1904, remaining in that position until September 19, 1917, when he was elected chairman, as above noted.



W. H. Howard

OBITUARY

B. F. Farrell, assistant general freight and passenger agent of the Chicago & North Western at Chicago, Ill., died at Evanston, Ill., on September 25. Death was brought on by a paralytic stroke suffered about two months ago.

William J. Wood, a member of the Indiana Public Utilities Commission and formerly attorney-examiner for the Interstate Commerce Commission, died at his home in Indianapolis, on October 3. He was born in Florence, Ala., March 30, 1850. At one time he was third vice-president of the Louisville & Nashville Railroad, in charge of the legal department.

Joshua Vansant McNeal, formerly fourth vice-president and treasurer of the Baltimore & Ohio, at Baltimore, Md., died on September 26. He was born on June 11, 1846, at Baltimore, Md., and was educated in the public schools and at Loyola College, Baltimore, Md. He began railway work in February, 1871, on the Baltimore & Ohio, as a clerk in the general freight office, and in April, 1872, was appointed traveling auditor. From October, 1872, to January, 1880, he was chief clerk of the auditor's office, and was then appointed auditor of the Indianapolis, Decatur & Western, now the Cincinnati, Indianapolis & Western, remaining in this position until May, 1893. He was then appointed assistant treasurer of the Baltimore & Ohio and was promoted to treasurer September 1, 1899. Mr. McNeal was elected fourth vice-president and treasurer on August 1, 1904, and retired from active service on June 30, 1916, at his own request, having reached the age of 70.



J. V. McNeal

Railway Age Gazette

Volume 63

October 12, 1917

No. 15

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* Illustrated.

The Erie Railroad, to insure that diffident employees shall not be buried under their own modesty, has invited them to write to their superintendent, recounting their experience and telling him what higher positions they feel qualified to fill; and the letters will be treated as confidential. This is the gist of a circular which has been issued by vice-president A. J. Stone, and which is printed in the Erie Railroad Magazine for October. "What is worth having is worth asking for," and this proposal ought to do some good—though the considerate superintendent will find that he has taken a large contract when he sits down to answer those men whose ability is not commensurate with their ambition. Ever since the sons of Zebedee desired to secure places as Assistant to the General Manager of all the Earth, short-sighted aspirants for promotion have been one of the ever-present peace-destroyers in the life of the tender-hearted employer. As a practical matter, the Erie circular lacks one important element; as important for the interest of the company as for the comfort of ambitious employees. It should ask them to say not only what places they can fill, but also what they could do after, say, a month's or three months' training. Many a bright young station agent or conductor, who would not claim to be able to fill a trainmaster's shoes, would be found to be excellently fitted for such a place if he were ordered to take it, and were properly guided at the start. This question would set such men to thinking.

"Patient continuance in well-doing" is the homely but scriptural phrase which indicates the only remedy for the costly delays to freight cars which still persist everywhere, in spite of the vast amount of good work that has been done already in speeding up both railroads and consignees. In other words, there must be *men*, numerous enough and persistent enough to ferret out every delayed car, and get the cause of delay removed. No efficiency expert has discovered any new trick. (If any road has female car tracers, all right; "men" embraces the women.) This is one lesson from the address of E. H. DeGroot, Jr., on the freight car situation, delivered before the New England Railroad Club at Boston last Tues-

day; and it is the gist of the opinions of those who discussed the paper. Cars which pile up fifty or a hundred dollars each in demurrage bills are still heard of too frequently. There is no royal road to happiness in such an extensive business as loading, moving and unloading a hundred million tons of freight every month. Mr. DeGroot covered admirably the whole field of freight car service. G. L. Graham, of the American Woolen Company, who took part in the discussion, told of an interesting movement to start "community loading"—all shippers in a Massachusetts city having customers in (for example) Cleveland combining to fill a car for the Ohio city, thus preventing loss of time at transfer stations and avoiding the delays of too infrequent "sailing days."

Many people seem to think that railways should carry soldiers and sailors on their trains free of charge, just as if

One-half Cent a Mile for Soldiers

the railways could give away transportation as the Y. M. C. A. gives away stationery and magazines, the Navy League, sweaters, or those in charge of a tobacco fund, cigars and cigarettes. The only commodity a railway has to sell is transportation, freight and passenger; and there is no more reason why a railway should carry soldiers or sailors free than that a shoemaker should give them their shoes, or a clothier their uniforms, a publisher, their newspapers, or a landlord, their houses free of charge. In fact, some of these clothiers and landlords are doing just the opposite; they are not reducing prices but raising them, overworking, as it were, the law of supply and demand and charging prices much above the average. It is all the more to the credit, therefore, of a railroad that reduces fares for the men in uniform to one-fourth or one-fifth its regular fares. The railroad in this case is the Long Island. It serves Camp Upton, 63 miles from New York, where the drafted men from that city will train for the National Army. The regular round-trip fare to the camp is \$3.54; visitors to the camp will be carried to the camp on special trains at an excursion fare of \$2.50, but on certain of these trains, those best timed for the use of the soldier, there will be a round trip fare for men in uniform of 60 cents. This figures out on the basis of 126 miles at less than one-half cent a mile. The specials will run over

Car Service Discussion at Boston

a busy single track line and on a better schedule than the regular trains and will make but one stop between Camp Upton and Jamaica, where passengers will change from steam to electric equipment.

as the public is concerned the average traveler, if he understands the situation, is willing to meet the railway more than half way.

THE OBLIGATION TO REPORT DISCOURTESIES

THE writer of a communication on a following page concerning courtesy to the traveling public is right in stating that railway passengers as a general rule will not report the discourtesies of railway employees. This statement may, of course, meet with criticism on the part of some passenger traffic men who may have been led to believe by experience that all some of their patrons ever do is to complain; but it is nevertheless true. The average patron either does not like to or does not want to take the time to compose a reasonable letter of criticism, and seldom does he go beyond wondering to what officer he should address such a letter. The railway officer should not forget that a passenger is under no obligation whatsoever to report discourtesies. It may be an act of kindness to report them, but it is no obligation. The obligation is on the railway—to see that its employees give the traveler efficient and courteous service.

The railways, as far as courtesy is concerned, are like other businesses, with the exception that they have a much harder row to hoe. The retail store has its problem in finding out whether its patrons are satisfied, for when a patron is not satisfied, in most cases, he does not complain, he simply does not trade at that store any more. "If you like our service, tell your friends, if you don't, tell us," many of these stores advertise. The retail store has the advantage of having a clerk's sales as a yard-stick, as it were, of courtesy. The railway, of course, can have no such measure of efficiency and courtesy. A railway passenger's feelings in most cases cannot affect his purchases of tickets; they affect his friendliness and good-will; and it is these elements that count. The railway might say, "If you like the way we treat you, tell your friends and your representative in the legislature, if not, tell Mr. —, our general passenger agent," or something of the kind.

There are roads that are already doing this. The Bay State Street Railway, in its "Your Street Railway Service," the publication it issues to its patrons, says "Don't growl about the service, even when it is bad—kick. Kick straight to us. Write us letters just as frankly as you please. Call a spade a spade. . . . Don't tell your neighbor how bad the service is, tell us all about it. Give us specific data upon which we can work when we try to make improvements." Perhaps some of the steam railways might work out the same idea, and how could they work it out better than by using their time-tables for the purpose? A couple of well-chosen sentences in one of the spare spaces in the time-table would be just the thing. "Mr. Passenger, we are doing our best to give you first class service. If you are not getting what you should expect, we want to know it; but we can't find it out unless you tell us. Write our Mr. —, he will appreciate your kindness and will take immediate steps to find out what is wrong and to remedy the condition."

But, even so, the point still is that most passengers will not complain of discourtesy and ill-treatment even if they are asked. It cannot all be put up to the passengers. What, then, is the answer? Apparently some roads already have it. First and naturally there must be a one hundred per cent effort to render efficient and courteous service. Second, there must be education and as nearly perfect supervision as possible. Educate the employee that the public must be pleased and to tell the public that the railway is doing its best to please. Supervision should serve as the examination to find whether the course of lessons is being understood and followed by the employees with creditable efficiency. So far

DINING CAR MEALS

A CORRESPONDENT, whose letter is published elsewhere in this issue, thinks a dining car ought to be able to serve a 35 cent breakfast, a 50 cent lunch and a 60 cent dinner, and he points out the fact that he knows of city restaurants that do this. Forgetting for a moment that the kind of food and the class of service in a dining car are comparable not to a cheap restaurant, but to a good hotel where room and bath would be in the neighborhood of \$4 to \$5, let us stop for a moment to see what the dining car costs are compared with a cheap city restaurant. Take overhead costs first. There are no average figures available for the whole country as to how far a dining car has to be hauled to serve a lunch or dinner, but 100 miles is conservative, and two meals a day on the average is all that a great many cars can serve. The expenses per mile of carrying a dining car are rather higher than the average expenses of carrying all-passenger cars. Taking a year when costs were not as high as they are now, the Pennsylvania's passenger train expenses per mile were \$1.475, and the average number of cars in a train were 5.52, so that the average cost per car-mile is 27 cents, or for 100 miles \$27. This allows no rental for the car itself, but simply is the cost of hauling it. The rental of a dining car is about \$25 a day.

Again there are no average figures available for the whole country as to the number of people to whom meals are served at each meal time. On some roads it would be as low as 50 and on other roads more than twice that number. Let us take 75 as the average number. This would be 150 meals per day with a rental charge of \$25 and a haulage charge of \$54, or an overhead charge per meal of 53 cents. Compare this with a down-town Childs restaurant in New York, where there are three floors, each 175 ft. x 50 ft., or 26,250 sq. ft. of floor space, with, say, a rental charge of \$40,000 a year, or approximately \$110 a day. This restaurant serves approximately 8,000 meals a day, so that the overhead charge per meal served is less than 1.4 cents, and yet with such a small overhead charge a breakfast such as is suggested by our correspondent would cost apparently about 40 to 45 cents. A 40 cent breakfast as made up in a New York Childs restaurant consists of a sliced orange, bacon, one egg, potatoes, toast and coffee; ham instead of bacon is 5 cents more. It would be possible to pick out a lunch for 50 cents and a dinner for 60 cents, but not including roast beef or roast chicken with potatoes, dessert and coffee or milk.

Yet a Childs restaurant is run at a profit and most dining car service is operated at a loss, the fact being, of course, that not only are strictly overhead costs of a dining car many times as great as the overhead costs per meal served in an inexpensive city restaurant, but the costs of service, of cooking, of fuel, of ice and everything else incidental to the meal are many times greater for a dining car than for the restaurant. But, as was pointed out at first, this is comparing two very different things. Dining car meals are comparable to the meals served in a hotel like the Statler at Buffalo, Cleveland or Detroit. The Statler at Buffalo has recently inaugurated serving what is called a Liberty Lunch, based on "more vegetables—less meat—one way of helping to win the war." As an example, for 65 cents beef saute, cauliflower in butter, French fried potatoes, creamed spinach, stuffed cucumber and coffee or milk are served. This is served all on one plate with a small helping of each one of the articles named. It would presumably be quite impossible to serve a meal such as this if there was not also to help pay the overhead charges a very large number of meals served from the regular menu, where soup varies from 30 to 40 cents, fish from 60 to 75 cents, where roast beef is 70 cents and French fried potatoes

25 cents, etc. These latter prices compare favorably with the prices on dining cars notwithstanding the fact that even with the Statler or like hotels the overhead charges per meal served are presumably much lower than on a dining car.

About the kind of meals, size of portions, etc., that should be served in a dining car there is an infinite difference of opinion. "What is one man's meat is another man's poison" is an old and homely saying, but no one probably appreciates the full force of it more than does a dining car steward. His task is far harder than that of the head waiter of a good hotel because, as our correspondent points out, there are many people who take meals on a dining car that would not go into the restaurant of a Statler hotel for dinner. The class of service, the prices and all are strange to such travelers. To try to please all of them is an utter impossibility. About the best that can be attempted is for a superintendent of dining car service to set himself an ideal and to try to live up to it himself and to see that each steward of each car is trying to live up to this ideal. To get any agreement on what is good service among the varied patrons of dining cars is an impossibility.

STATE LEGISLATION RELATING TO RAILWAYS

THE state legislative mills have been grinding merrily on during 1917 with their customary activity and the usual variety of grist of railway legislation. The facts are shown in a bulletin just issued by the Special Committee on Relations of Railway Operation to Legislation. The 43 legislatures which have been in session within the year have enacted 140 laws relating to railway operation. This is the largest number of new laws passed in any one year except 1913 of the six years during which the committee has kept the record. In 1913 230 such laws were passed, and in the six years from 1912 a total of 605 laws relating to railway operation were added to the statute books.

Not all the legislative attempts to govern railway operation were successful. In the 1917 sessions of these 43 legislatures 808 bills were introduced, and this number also constitutes a record for the seven years during which records of bills have been kept, except in 1913 and 1915 when 1,395 and 1,097, respectively, were introduced. The total of bills affecting railway operation introduced in the seven years is 4,538. The largest number of laws enacted under any one of the 63 heads under which the committee classifies the result is 12, relating to grade crossings. Nine laws were passed relating to track connections at stations, and the same number were passed relating to the equipment of passenger trains.

The never-wearied activity of labor organizations resulted in the enactment of eight laws relating to service letters, time and manner of payment, and six relating to terms and conditions of employment. There are six new laws relating to separation of grades, six relating to destruction or theft of property and six relating to trespassing. Four relate to the furnishing of cars.

When the new enactments are segregated by states it is made to appear plainly that state regulation of railways is a disease that is apt to manifest itself with increasing virulence as the years pass. The states that in 1917 passed the most laws relating to railway operation are, generally, those that have been the most active in formulating regulatory measures in previous years. For example, Kansas leads the list in the present compilation with 12 laws enacted and ties with Missouri on 54 bills introduced. Missouri redeemed her record by passing only four. California is second with nine passed out of 30 introduced, and Ohio and Maine tie for third place with eight laws passed out of 24 and 18 bills introduced in the respective states. Iowa, with 6 laws from 22 bills introduced, Minnesota with 6 from 46 bills, Montana with 6 from 17 bills, and Oregon with 6 laws from 15 bills, maintain their records of previous years.

Letters to the Editor

IMPACT ON RAILROAD BRIDGES

NEW YORK.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

A reading of A. C. Irwin's letter on "The New Impact Formula" printed in your issue of August 3, gives one a wrong impression as to its utility; and by comparing this formula with the so-called 300 formula on the same basis, the reader is led to conclusions which are incorrect.

30,000

The ————— formula is intended to cover only

30,000 + L²

the effects of impact, true impact and nothing else. The 300

———— formula was originally intended to cover not only

300 + L

impact but some allowance for secondary stresses, future increase in loading, deterioration and several other factors of ignorance.

Whether it is more desirable to separate these various factors and design bridges by finding all the stresses, primary, secondary and true impact, and then add something for corrosion to the area of members thus required; or to proceed as at present, throwing all the unknown factors into a general factor which in itself is more or less an unknown, is not a matter of discussion. Individual ability and time will determine the use of one or the other.

The new formula has been adopted by the American Railway Engineering Association without the change of unit stresses from the present specification and with two provisions—(1) that the impact shall not be considered to cover the effect of secondary stresses, and (2) the live load used shall be large enough to cover future increase of loading. No such provision is included in the unit stress or impact.

300

As the ————— formula does include an allowance for

300 + L

secondary stresses, future increase of live load, possible effect of repetition and corrosion, besides impact, it can readily be seen that the formulas are not comparable.

30,000

The ————— formula, if used properly in conjunc-

30,000 + L²

tion with all the other factors, is therefore not easy of application, and moreover does not result in any economy in the weight of steel in bridges, the two reasons given in Mr. Irwin's letter urging its general use.

HERMAN D. HIRSCH,

Assistant Engineer, American Bridge Company.

CHICAGO.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The inability of any one formula to cover all the factors suggested by Mr. Hirsch is apparent and the old formula did not really cover any of them properly, except perhaps the factor of ignorance. Moreover, it has not been used in general as a "cure-all" by designers, nor is there sufficient evidence to show that it was so originally intended.

In 1887 the Pencoyd Iron Works published specifications written by C. C. Schneider, in which the dynamic effect of the live load was allowed for by the formula:

$$I = 0.7 + \frac{5}{L}$$

The addition to the live load given by this formula was

intended to cover not only the dynamic increment, but also an allowance of about 20 per cent of the live load for secondary stresses. This formula was changed about 1894 to:

$$I = 0.1 + \frac{220}{L + 240}$$

because it was thought that too great impact was given by it for long spans, but soon after it was discovered that almost identical values were given by the simpler formula:

$$I = \frac{300}{300 + L}$$

and this was adopted by Mr. Schneider and published in specifications in 1895.

Thus the old "300" formula was obtained from a previous one which was intended to provide about 20 per cent for secondary stresses, by changing it so as to give lower values for long spans. Comparing the first formula with the last one, it is seen that for a span of about 285 ft. the latter provides for 20 per cent less impact than the former and thus the allowance for secondary stress assumed to have been provided in the original formula is wholly wiped out in the last one.

It requires but casual consideration of the fundamental principles governing the determination of secondary stresses to see that neither the old nor the new A. R. E. A. formula can properly provide for these stresses. Secondary stresses are produced by dead load as well as live load and result entirely from the rigidity of the joints. Thus the secondary stresses in a pin-connected truss are limited to the friction on the pins. Secondary stresses are in general proportional to the ratio of the width of a member to its length and theory and experiment show that ordinarily in riveted trusses the end posts and members in the end panels receive the highest secondary stresses. If the old "300" formula provided for secondary stresses, it should give the highest impact for these members, but on the contrary, it provides for a lower impact factor on these members than those near the center of the span. It is thus seen that the factors governing secondary stresses have no relation to the impact formulas under discussion.

Referring to the provisions attributed to the old formula for future increase in loading, it has not been the practice of designers to so credit it,—the increase in future loading being provided for by an excess of design loading over those prevalent at the time. The old and the new A. R. E. A. formulas are comparable because the old one has been used almost exclusively as purely an impact formula just as it is proposed and expected that the new one will be used. The difference, however, is that the old has neither the theoretical nor the experimental foundation which is possessed by the new which is based on the most extensive and trustworthy impact tests ever performed in any country. The new formula should be used because it results in slight economy and because it gives the nearest reflection of the effects of impact that are at present available.

A. C. IRWIN.

DINING CAR MEALS

CHICAGO, ILL.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Breakfast, 35 cents; lunch, 50 cents; dinner, 60 cents; these prices are enough for regular meals in the dining car, but the traveller ought to be able to order from the usual bill of fare if he wishes to. Have the meals announced through the train as follows: 35-cent breakfast now served in diner at the rear (or forward), 50-cent lunch now served, etc., 60-cent dinner now served, etc.

You must admit that a railway journey is an event to a

great many persons, and they like the meals, all but the price. Now, they take their lunches and don't eat in the diner, a great many of them. There is no reason why a diner shouldn't serve good meals for the above prices, and the plan should prove very popular.

For 35 cents they could serve coffee, rolls and fried ham, or coffee, toast and bacon, or sausage, wheat cakes, honey and coffee.

For 50-cent lunch they could serve hungarian goulash or fish, coffee, ice cream or pudding.

For 60-cent dinner they could serve roast beef or roast chicken or fish, coffee, tea or milk, potatoes, pie, ice cream or pudding.

Personally, I know of a good many city restaurants who serve these kind of meals for less money and they are good substantial meals also. A diner buys in large quantities and is always near a market. It should be able to purchase as cheaply as a city restaurant. At these prices a diner should make more money than it now does. Fewer people would carry their lunches.

The United States Navy buys in large quantities, and each battleship stores enough food for three months. It costs the government 45 cents a day, or 15 cents a meal, to feed a sailor. A diner should be able to almost duplicate this cost.

J. A. DEAN.

PASSENGERS WILL NOT REPORT DISCOURTESIES

NEW YORK.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I have read with a great deal of interest your editorial entitled "The Courtesy Killer," in the issue of September 14, and fully agree with all said therein as far as it goes, but it strikes me that you should have gone a step further.

Surely, the carriers have made, and are making, most strenuous efforts to educate their employees on the courtesy question. I have seen in many stations and offices neatly framed posters containing masterly written exhortations to be courteous under any and all circumstances. The same thing has been conveyed to employees in circulars time and again, but how is the company to know whether these instructions are being complied with?

Take the case you cited: This would-be passenger evidently went about telling all his friends about the discourteous treatment he had received, probably damning the road and everybody connected with it, whereas it would have been an act of kindness to other would-be passengers and to the railroad if he had reported the case promptly to headquarters so as to enable the officers to apply the necessary discipline.

Unfortunately, as a general rule, people either won't be bothered to report a case of this kind or they don't have the moral courage to do so, with the result that the discourteous agent will continue in his position to the detriment of the road and discomfort of would-be passengers.

I know from experience that the carriers always appreciate this much needed co-operation on the part of the public, and any one with average common sense can judge in which instance it is wise and proper to report a case or when to keep quiet. But to go about complaining to outsiders instead of reporting to headquarters is utterly wrong in principle and does not benefit or help anyone.

TRAVELER.

OIL FUEL IN COSTA RICA.—The Costa Rican railways are finding the use of oil fuel continuously successful. The Costa Rican Railway Company has expended the sum of £40,000 (\$194,400) upon a new installation for the use of oil fuel in the place of coal.



Decapod Type Locomotive for the Russian Government.

Decapod Locomotives for Russian Government

A Notable Order Consisting of 1,231 Heavy Locomotives, Built for a Foreign Country by American Builders

ONE of Russia's most imperative needs is increased transportation facilities. Additional motive power and rolling stock are urgently required, and American manufacturers are furnishing locomotives and cars in large numbers, as rapidly as facilities will permit. Since the summer of 1914 the total number of heavy freight locomotives ordered by the Russian Government railways from the Baldwin Locomotive Works and the American Locomotive Company is 1231, the former company furnishing 725 and the latter 506. These locomotives probably constitute the most notable group of heavy power ever shipped by American locomotive builders to a foreign country. Those last ordered will be completed during the year 1918. In addition, 50 locomotives of similar type have been supplied by the Canadian Locomotive Company.

The design and construction of these locomotives were under the direction of A. I. Lipetz, chief of the locomotive division of the Russian Mission on Ways of Communication in this country. They have been built on a number of different orders; but, although the later engines present various changes in details, as compared with those first constructed, the locomotives are all of the same general design and hauling capacity. The wheel arrangement is 2-10-0, and the tractive force exerted is 51,500 lb. The maximum load per driving axle is limited to 16½ metric tons. The locomotives are designed to operate on curves of 700 ft. radius on the main line and 350 ft. on sidings, and to handle 1,300 metric tons up a grade of 0.8 per cent, at a speed of 8 to 10 m. p. h. They have ample capacity for doing this, while working at a fairly economical cut-off.

The locomotives now being built by both the Baldwin Locomotive Works and the American Locomotive Company are identical in construction. In general design they follow American practice, although many of the details are in accordance with Russian standards. The Russian engine crews can, therefore, handle them without difficulty.

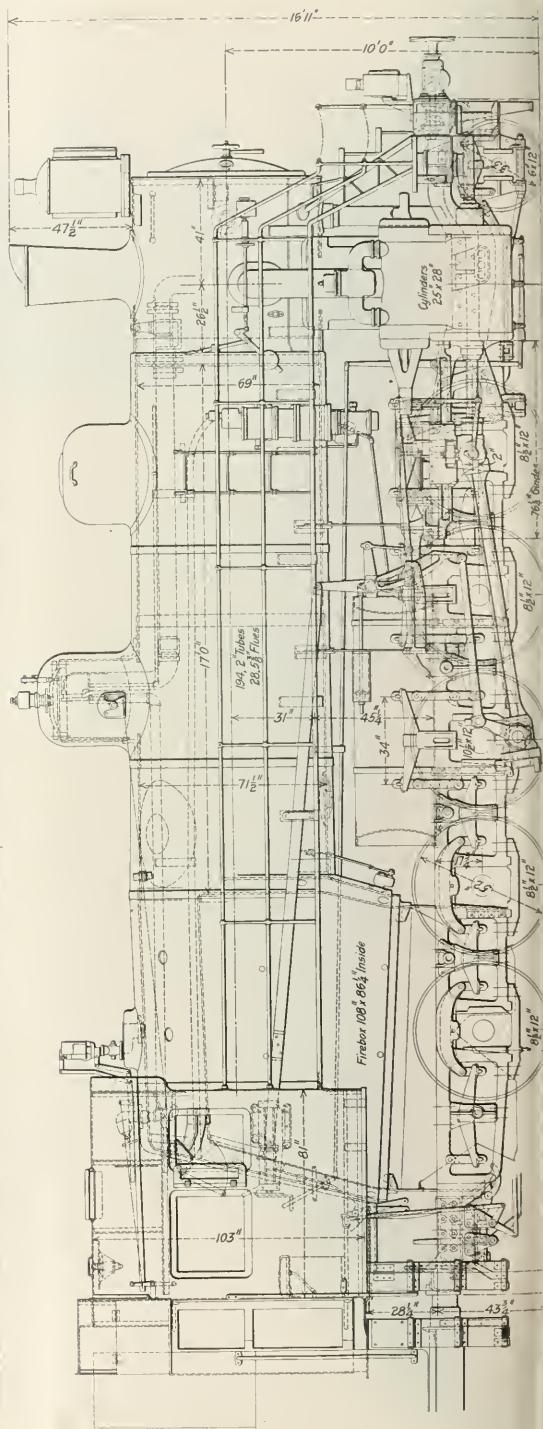
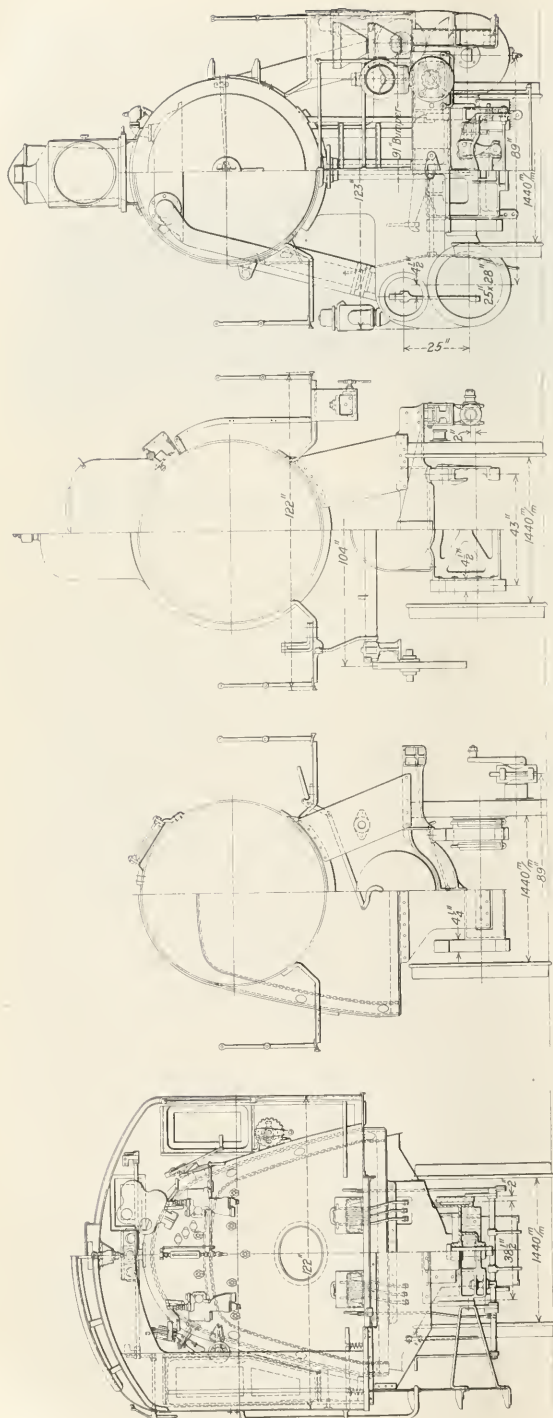
The boiler is of the straight top type, with a wide firebox which is placed above the rear pair of driving wheels. The boiler center is placed 10 ft. above the rail, and this allows ample room for a deep throat, and for the installation of a Security sectional arch supported on water-tubes. The fire-

box is radially stayed, and a total of 462 flexible stays are used in the water legs. Of these, 286 are placed in the sides; 84 in the backhead and 92 in the throat. In addition, four transverse rows of expansion stays support the front end of the crown and one row is used at the back.

The equipment of hand-holes and wash-out plugs is unusually complete; and a man-hole, 15½-in. in diameter, is placed on the round of the boiler on the left hand side, just forward of the firebox. The dome is of the built-up type, with an inside diameter of 30 in. Three safety valves are provided, one of these being mounted on the dome cap, and the other two on a specially designed turret, placed over the firebox and immediately in front of the cab. Two whistles are also mounted on this turret, and the rigging is so arranged that one of them can be blown from the train, by means of an outside cord connection.

The throttle valve is of the sliding type, in accordance with Russian practice, with a small auxiliary valve which opens first, facilitating the opening of the large valve and this same small valve is used when drifting on engines which have no by-pass valves. It has outside connections with the lever in the cab and is arranged to open with a downward movement of the slide. There are two ports in the vertical throttle-pipe, and they are tapered in width, so that a very small opening can be obtained. Springs are provided to assist in holding the slide against its seat.

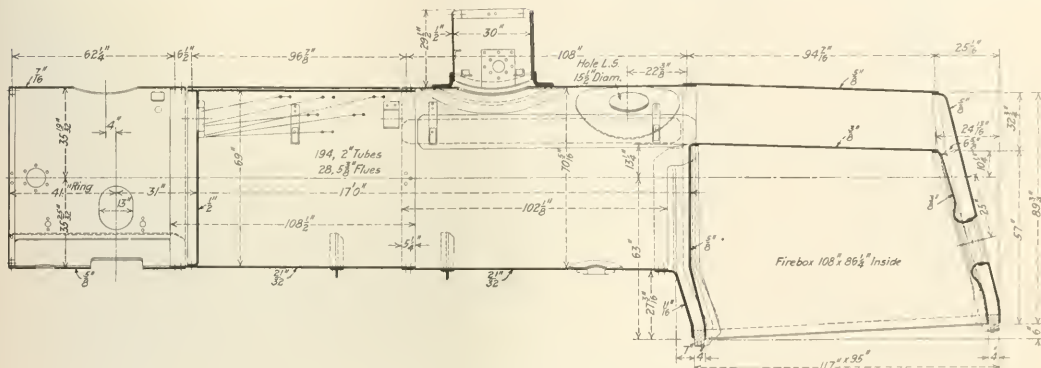
These locomotives use superheated steam, and are equipped with a 28-element fire-tube type superheater. The superheater damper is arranged with several openings, which are placed in the front wall of the box enclosing the header. This construction replaces the single damper opening in the bottom of the box, which is ordinarily used in American locomotives. The cylinders are of the two-piece type, designed in accordance with American practice. The steam distribution is controlled by 12-in. piston valves. These are fitted, at each end, with light cast steel heads and spiders, between which is placed a cast-iron bull ring. The heads and spiders are mounted on the valve stem, which is extended through the front head. The packing rings and steam chest bushings are of gun-iron. The Walschaert valve gear is applied, in combination with a screw reverse mechanism of Russian



type. The pistons are of rolled steel, with extended piston rods, and the crossheads are light steel castings sliding on single bar guides. The back end of the main rod is fitted with a forked stub of Russian design. A steel filling piece is slipped over the fork between the brass and the key and this filling piece is fitted with a lug through which pass the two key adjusting bolts.

Some of these locomotives are equipped with the Zybloff

tion between the two ends of the cylinder. Another device of special interest is the Shukaloff drifting or vacuum relief valve, which is used in conjunction with the Zybloff by-pass valves. This valve communicates with the superheated steam section in the smoke-box header. When the engine is using steam, the pressure forces the valve down and holds it shut. When, however, the engine is drifting and a vacuum is created in the steam passages, the valve rises from its seat and



Boiler Elevation of the Russian Locomotives

by-pass valve. This device is arranged with a pipe connection 4 in. in diameter, which communicates with the steam ports at each end of the cylinder. In the center of this connection is placed a vertical plunger, formed in one piece with two pistons. When the throttle is open, steam acts on the

air is admitted through a suitable strainer. At the same time, a pipe connection is opened, through which a small quantity of saturated steam is admitted to the superheater header, and thence to the cylinders. This assists in breaking the vacuum and in keeping the valves and pistons properly lubricated.

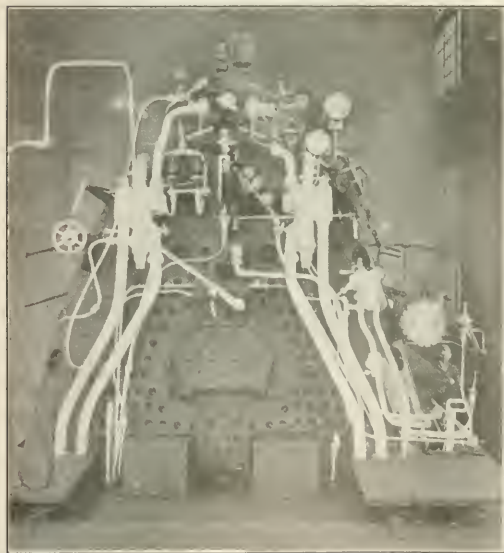
The exhaust opening is variable and is worked, through suitable connections, by means of a hand-wheel placed in the cab. The exhaust nozzle contains a hollow frustum of a cone, which can be raised or lowered. When in its top position, all the exhaust steam passes out through the interior of the frustum; and when it is lowered, an annular opening around the frustum is provided in addition.

The frames are vanadium steel castings, 4 1/2 in. in width, and placed 43 in. between centers. The equalizing rigging is anchored to the frames between the third and fourth pairs of drivers, but is so arranged that, if desired, it can be changed and anchored between the second and third pairs. The leading truck is equipped with three point suspension links, and is equalized with the drivers in the usual manner.

The driving-wheel centers are turned to metric measurements, and the tire widths and transverse spacing also conform to the metric system. The wheels are designed to balance approximately 45 per cent of the weight of the reciprocating parts. The driving tires are shrunk on the centers, and are held by set screws and retaining rings in addition to the usual shoulder. The tires of the third, or main pair of wheels, are flangeless.

The front bumper is of steel built up, and screw couplings and spring buffers are applied in accordance with Russian railway practice. Two large signal lamps are placed on the front bumper when running forward and at the rear end of the tender when running backward, while the headlight is mounted on top of the smoke box.

Included in the equipment of these locomotives, are Russian-Westinghouse automatic air brakes, LeChatelier cylinder water brakes, electro-pyrometer for indicating superheated steam temperatures, and a six-feed mechanical lubricator. The injectors are of the Russian vertical type, and are mounted on the back head. In connection with them, sprinklers are applied for the ash-pan, smoke-box and cab deck. Power-operated fire-doors have been applied to a



Back Boiler Head of the Russian Locomotives with the Cab Removed

power piston, pushing the plunger up against a spring, and closing communication through the pipe connection. When the throttle is closed, and the steam pressure is relieved, the spring forces the plunger down, and there is free communica-

Railway Fire Protection Association Meets

Reports on Fire Prevention as Related to Explosives, Electrical Hazards and Storage of Pulverized Coal

THE fourth annual convention of the Railway Fire Protection Association was held at St. Louis, Mo., from October 2 to 4, inclusive. B. S. Mace, superintendent of insurance of the Baltimore & Ohio, and vice-president of the association, occupied the chair in the absence of P. Hevener, the president, who is now a first lieutenant in the National Army. The attendance was somewhat below that of last year, but the secretary reported an increase in total membership from 95 to 113. Mr. Mace was elected president for the coming year, Robert Scott, superintendent of insurance of the Atlantic Coast Line, was elected vice-president, and G. L. Ball, superintendent of insurance of the St. Louis-San Francisco, was made secretary-treasurer. The following new members of the executive committee were elected: P. Hevener, superintendent of the insurance department of the Chicago, Rock Island & Pacific, and now in the army on leave of absence; W. F. Hickey, superintendent of insurance of the New York, New Haven & Hartford; C. N. Rambo, of the Norfolk & Western, and E. W. Osborne, insurance inspector of the Northern Pacific.

Resolutions offered by the Committee on Resolutions, C. N. Rambo, chairman, emphasizing the importance of continued and increased attention to fire protective measures were unanimously adopted by the association and will be sent to the presidents of all the railroads in the country.

EXPLOSIVES AND OTHER DANGEROUS ARTICLES

The report of the Committee on Explosives and Other Dangerous Articles, W. S. Topping, Bureau of Explosives, chairman, is abstracted below:

For the period from 1907 to and including June, 1917, the total number of explosions occurring in the transportation of dynamite alone amounted to a total of 27 resulting in the death of 10 persons and the injury of 35 others, and a total property loss of \$611,244. The causes have been segregated and we find that of the total of 27 accidents six were chargeable to failure of railway employees to remove or isolate shipments before they were reached by fire originating through other sources. Five accidents were due to failure of the carrier to enforce prompt removal by the consignee, or to otherwise dispose of shipments of high explosives. Three were due to concealed shipments of high explosives in trunks or in household goods shipped by miners. In two instances explosions were due to fire consuming cars of explosives, the origin of the fires being due to defective car roofs and caused by sparks lodging thereon. In two other instances cars of explosives were involved in derailments.

Our records also show that the following causes are each responsible for an accident:

1. Leaking cases loaded without staying end on end.
2. The placing of a car of high explosives next to a car placarded "Inflammable" and alongside a cinder bank.
3. Failure to place car in center of train, and improperly placing car between tank car and car of rails.
4. Failure to inspect or properly prepare car, draft bolt being replaced and not covered with wood.
5. Failure of brakeman to adjust switch, which derailed the car.
6. Failure to enforce prompt removal by consignee at a non-agency station and storing shipment in shed.
7. Spontaneous decomposition of unsafe explosives not passed upon by the Bureau of Explosives and failure promptly to dispose of a leaking astray shipment.
8. Careless handling, permitting case to fall under car.
9. Intentional explosion by a criminal.

BLACK POWDER

Black powder is usually shipped in metal kegs and under the regulations these kegs are so loaded and stayed as to

prevent movement in ordinary transportation, but the shocks cars receive incident to switching and yard movement sometimes have the effect of breaking down the staying and of permitting the kegs to roll over the car floor, and our records show many instances wherein these kegs have been ruptured and grains of powder spilled on the floor. In not all of these instances, however, has an explosion occurred because of the care exercised by railway employees upon discovery of these bad conditions. It goes without saying that the proper place for explosives is in their containers and not strewn over a car or warehouse floor.

Black powder is much easier of ignition than is dynamite or smokeless powder and when the leaking grains of powder are ignited, even though the ignition of these grains may occur some distance away from the kegs of powder, there is a grave possibility of the ignition communicating to the entire shipment. The ignition of black powder may easily occur through a spark made by contact between metal surfaces, or a flame from a lighted torch. A lighted hand lantern while not the safest sort of light to use around black powder, probably would not cause trouble.

For the period from 1907 to and including June, 1917, the total number of explosions occurring in the transportation of black powder amounted to a total of 18, resulting in the death of 38 persons and the injury of 78 others, and a total property loss of \$125,723. The causes have been segregated and we find that of the total of 18 accidents three were due to derailments, two were chargeable to the concealment in articles of baggage, while the remainder were due to lightning, sparks, leakage, carelessness in loading, failure to keep tramps away, a rear end collision, impact with another car in switching, etc.

OTHER DANGEROUS ARTICLES

In the year 1916 there were 536 accidents connected with the handling of acids, which resulted in the injury of 35 persons and a property loss to the carriers of about \$75,000. Of the various kinds of acids handled, the most dangerous in transportation are nitric acid or mixed nitric acid and sulphuric acid. Either of these acids will cause fires when in contact with combustible material. The use of glass containers for the shipment of nitric acid undoubtedly is the cause of practically all of the fires, taking into consideration the failure of shippers properly to prepare their packages, rough handling on the part of carriers and failure of carriers' employees to exercise proper supervision over the acceptance and loading of such shipments.

Of the other dangerous articles the greatest hazard is in connection with the movement and handling of inflammable liquids. Under the regulations an inflammable liquid is one that has a flash point at or below 80 deg. F., which means that at a temperature of 80 deg. F. or below the liquid gives off inflammable vapors that will ignite on contact with flame. In 1916 70 serious accidents occurred in the handling of gasoline, and cost the carriers \$137,860 and we find that the cause of these accidents was:

1. Deraillments and ignition of vapors or liquid by sparks produced by contact of metal surfaces.
2. Ignition by trainmen's lanterns.
3. Draining of automobiles in cars or on platforms; ignition of the liquid or vapors by lighted matches or lanterns.

1917 TROUBLES

The record so far compiled for this year shows a repetition of careless acts on the part of railway employees and shows

many accidents and fires that could have been avoided by the exercise of proper care and attention to details. Inflammable liquids in tank cars seem to have been involved in fires of considerable frequency. But as stated before, derailments were in many instances the contributing causes. In handling derailed tank cars fires have occurred due to failure of employees to act with extreme care and observe well-known precautions. Other tank car fires were due to failure on the part of railway employees to prevent ignition of leaking gasoline between the tracks. Two serious fires were caused by disobedience of rules with respect to removal of dome covers while contents of tank cars were known to be under pressure.

PUT OUT THE FIRES BEFORE THEY GET BEYOND CONTROL

When fires occur in connection with the transportation or storage of explosives or other dangerous articles, the one important thing to do is to stop the fire in its early stage, and for this purpose qualified and well-trained employees are essential. The best manner of extinguishing these fires depends upon the immediate existing local conditions. Fires caused by nitric acid or mixed nitric and sulphuric acids can be controlled by the careful use of water. In the application of water care must be exercised as in contact with acid it is liable to cause slight explosions, accompanied by the projection of hot acid, which may cause dangerous burns. Therefore, the water should be applied from a safe distance. Sand may also be used to stop a fire started by acid, but if the fire has thus been stopped, the early use of water is desirable to prevent the fire breaking out again. Thoroughly flush away any remaining acid and remove leaking or damaged containers. In all fires caused by nitric or mixed acids, a considerable amount of nitrous fumes will be given off; these fumes are extremely irritating and are poisonous. Employees should not enter a car or other confined space where such fumes are present.

Fire in a case of friction (strike anywhere) matches frequently involves ignition of the match heads in one or more of the inside cartons. If the outside box is not broken open and the smoke dies away after a moment or two, no further action is necessary, as the fire has already been extinguished for want of oxygen, and nothing will be gained by opening the box. If the fire has gained some headway, the burning box or boxes should be removed from the car or warehouse if this is possible; or water should be freely used. Boxes should not be broken open, as the fire will be increased by such action.

Fires in ground charcoal or in charcoal screenings are best handled in removing the burning packages (usually bags). If conditions are such that removal is not possible, water may be used sparingly to extinguish the visible fire; then remove all of the charcoal and separate the wet from the dry charcoal. The dry charcoal should be stored under cover and under observation for several days before permitting such a shipment to move forward, as it is probable that fire may burst out again. The wet charcoal should be destroyed as it is unsafe to transport. Fires in lump charcoal should be extinguished with as little water as possible and the wet charcoal removed from the balance of the lading. The same precautions as to observation for several days should be followed to see that fire does not again occur.

Fires which involve only a small amount of gasoline can often be extinguished by the liberal use of water, but if there is a large amount of gasoline already ignited, water will only spread the fire. Sand or earth should be used to control the flames of the burning gasoline, and could possibly be used in sufficient quantity to smother the fire.

Fires involving tank cars may occur through ignition of the vapors escaping from a safety valve. The burning of these vapors and even of the liquid itself is not a serious matter except as a source of trouble to surrounding prop-

erty. An effort should be made promptly to extinguish such fires by the use of wet bagging thrown over the safety valve, pouring sand in quantity on top, or if the means are available, by the use of a heavy jet of steam. If this cannot be done, isolation is the proper course to pursue, and the fire will eventually burn itself out.

Carbon tetrachloride, the basis of many of the various chemical fire extinguishers, if thrown on an oil fire forms a heavy non-inflammable vapor over the liquid, and mixes readily with oils. The vapor is about five times as heavy as air, and although the fumes from carbon tetrachloride are pungent, brief exposure to them does not cause permanent injury. The efficacy of carbon tetrachloride depends largely on the skill of the user.

Sawdust may be used by means of long-handled shovels, in extinguishing fires involving open tanks. The sawdust is not easily ignited, but floats on the surface forming a blanket which will exclude the oxygen of the air.

Fires in sulphur are best extinguished with water, or if discovered at the start the burning portion may be removed. Sulphur does not burn rapidly nor will the fire spread rapidly. After a fire is apparently extinguished the shipment should be kept under observation, as owing to the low ignition temperature fire may burst out again. The fumes are suffocating and should be avoided by employees.

Nitrate of soda is not easily ignitable, but when intimately mixed with organic matter, such as jute bagging, is liable to cause serious trouble if ignited. The melted nitrate retains a great deal of heat and when water is thrown on it the sudden generation of steam will cause the melted nitrate to scatter and start fresh fire. Whenever practicable, fires in shipments of nitrate of soda should be smothered immediately, as they are difficult to extinguish with water after gaining any headway.

Leaking or damaged cases containing bromine require careful attention in order to avoid fire and, particularly, personal injuries. Fumes of bromine may be neutralized and settled by using ammonia water or household ammonia sprayed through a sprinkler or watering pot. Sufficient ammonia should be sprinkled to counteract the bromine fumes, and the box and packing saturated with the bromine should be saturated with sufficient ammonia so that the odor of ammonia becomes more noticeable than the bromine. After neutralizing the bromine, the broken or leaking bottles can be removed from the cases.

The Bureau of Explosives early took hold of the question of properly constructed cylinders for acetylene and very exhaustive tests were conducted. Finally, with the active co-operation of the acetylene industry, the bureau developed its regulations so that the hazard of transportation has become negligible, and thus the cylinders are now so safeguarded that the widespread use throughout the country, so far as approved cylinders are concerned, is not accompanied by undue hazards. As regards the oxygen cylinder, the bureau has made more and more rigorous regulations, developed systems of inspection and test, including permanent records so that the oxygen cylinder with its 1,800 lb. pressure to the square inch goes through the vicissitudes of transportation and the use of half a billion feet of oxygen per annum and is not accompanied with accidents attributable to cylinder failure.

FIRE PREVENTION AND PROTECTION IN RAILROAD YARDS

The committee on Fire Prevention and Protection in Terminal, Classification and Storage Yards, F. A. Greene, Pennsylvania Railroad, chairman, was approved. The committee, however, was requested to continue its investigation of the subject and to make a final report at the next meeting. An abstract of the report follows:

PREVENTION

Preventive measures may generally be included under the phrase "careful housekeeping." All hay, straw, rubbish, paper, etc., should be removed and the doors of wooden box cars should be kept closed; grass, weeds and undergrowth should be kept out, and rubbish should not be allowed to accumulate in yards or near storage tracks and suitable incinerators should be provided, especially where car cleaning is done. Definite arrangements should be made for the disposition of trash. Cars should not be stored near hazardous risks, such as wooden grain elevators, warehouses, etc., or where exposed by the burning of adjacent property. Dead end tracks should be avoided as far as possible.

The watchman's service is important and should consist of regular tours of the entire yard both day and night, registering on approved portable watchmen's clocks from stations distributed throughout the yard recording at each station at least every two hours and at some station every 30 minutes. There should be a watchman for each 1,000 cars and in the selection for this service preference should be given to young able-bodied men with sight, hearing and sense of smell unimpaired. His duties would be to keep out trespassers, to close or have closed all car doors, to report dirty conditions in yard, engines throwing sparks, and he should be well informed as to the location of all fire appliances, fire alarm boxes, etc.

PROTECTION

Two factors to be considered in determining the outlay warranted are the number of men that are available to handle equipment and the ratio of the cost to the average value at risk.

The most economical and efficient method of protecting classification and storage yards is by equipping all shifting engines with fire extinguishing apparatus. There are several types of such apparatus on the market, all working on the general principle of syphoning the water from the engine tank by means of a steam jet, any one of which is capable of throwing a very satisfactory fire stream.

The great advantage of shifting engines equipped with fire extinguishing apparatus for the protection of yards is that they are readily moved to the fire and are ordinarily well distributed throughout the yard, so that at least one engine can be brought into service at any point promptly. In the hands of a proper organization shifting engines equipped with fire extinguishing apparatus can render almost as efficient service as water lines and fire hydrants. Two non-freezing type "listed" chemical extinguishers of the 2½-gal. size with shoulder strap attachments may be added to the engine equipment to good advantage.

In order to obtain the greatest efficiency from shifting engines equipped with fire extinguishing apparatus, a fire brigade organization should be formed in each yard or district and special instructions should be issued by the division superintendent and posted on the bulletin boards in the district covered and in such other places as may be necessary. These instructions should designate an employee, usually the yardmaster, to assume general charge of the operations of the engines to insure that they are given right of way through the yard in case of fire. The conductor of each crew should be held responsible for his own crew and the members of each crew should be assigned specific duties, such as first brakeman—laying of hose lines and assisting at nozzle; second brakeman—coupling of hose and assisting at nozzle; fireman—coupling hose to locomotive extinguisher and assisting engineman; engineman—care and operation of fire extinguisher. Suitable fire signals should be arranged for calling shifting engines or other assistance. Fire drills should be held every two weeks and reports made to the superintendent; water, however, should not be turned on during freezing weather.

HAND FIRE EQUIPMENT

For the further protection of yards, it is recommended that 2½-gal. chemical extinguishers be distributed in all heated yard buildings, such as scale offices, switch houses, etc., and that employees be designated to handle these extinguishers in the event of fire. In larger yards, it is also recommended that one or more 40-gal. chemical engines of the upset type be provided and a sufficient fire brigade organization formed to bring them into service.

WATER MAINS AND FIRE HYDRANTS

This type of protection is the most expensive to install and before recommending its installation a careful estimate should be prepared of the cost to determine if the values subject to risk from one fire are sufficient to warrant the expenditure. In this connection it should be remembered that while the aggregate values in yards are very large, nevertheless they cannot be considered subject to a single loss, as it is possible with efficient shifting service to remove the cars and prevent a general conflagration.

FIRE BRIGADE

The importance of a well trained fire brigade cannot be over-estimated particularly at points isolated or inaccessible to city fire protection. Frequently in laying out systems of fire protection, the fire brigade fails to receive the consideration which its importance deserves and fire pumps and distribution systems, however perfect, will prove of little value if the means are neglected by which their possibilities are to be realized.

In organizing a private fire brigade the use of the pamphlet on "Private Fire Brigades," issued by the National Fire Protection Association, is recommended.

SIGNALING SYSTEMS

The installation of approved fire alarm systems to cover wide areas, such as classification and storage yards, involves considerable expense and is warranted only where complete systems of water mains and hydrants are installed and a fire brigade organization is maintained. Under ordinary conditions, it is believed that the yard telephone service used in connection with the whistle alarms sounded by shifting engines or from the power plant will fully meet the requirements.

CITY PROTECTION

In most yards on account of inaccessibility, the efficiency of outside fire protection will be more or less reduced. It is important, therefore, that wherever public or volunteer fire departments are located within a reasonable distance of a yard care be exercised to maintain the roadways in good condition at all times. It is also advisable wherever possible to have a city fire alarm box or an auxiliary box located on the premises, otherwise the telephone number of the nearest city fire company should be shown on the fire alarm code.

PROTECTION OF WHARVES AND PIERS

W. F. Hickey, chairman of the Committee on Wharves and Piers, read a report which emphasized the great vulnerability to fire of most of the piers and wharves of the country and urged (1), fireproof construction of piers and wharves, (2), proper care and protection by officials and employees, (3), the provision of all means of extinguishing fires possible. He stated that at the present time extraordinary precautions were vitally necessary on account of the large amount of business being handled on wharves and piers, the danger of congestion and the nature of the traffic handled, which include considerable quantities of munitions. He recommended that the water end of piers and the bulkhead which abuts on the water front be guarded rigidly day and night with frequent watchmen clock records as that is the most likely place of attack for incendiarism by an alien

enemy. The work of this committee was continued with a request that it file a final report at the next meeting.

HAZARDS IN THE STORAGE OF PULVERIZED COAL

C. P. Beistle, chemist of the Bureau of Explosives, read a paper on Hazards in Connection with the Storage of Pulverized Coal, a liberal abstract of which follows:

In the development of the use of pulverized coal, together with many advantages and economies, there has appeared a certain hazard in handling and storage. This hazard under proper conditions is not severe, but should be recognized and provided against in designing and operating equipment. The hazards of pulverized coal are of two kinds. First: the hazard of spontaneous ignition, and second: the explosion hazard.

SPONTANEOUS IGNITION

It has long been known that spontaneous ignition takes place at times in the storage of bituminous coal. Observations of numerous fires in coal in storage and shipment show that the fires originate in coal in large bulk, preferably in the fine or slack coal, and that the spontaneous heating is apparently stimulated by moisture. It is also generally found that fires are more liable to originate spontaneously in coal containing comparatively large amounts of sulphur.

Closer investigation shows that freshly mined bituminous coal when exposed to air starts to absorb oxygen immediately. This oxygen at first combines directly with unsaturated compounds in the coal, and in so doing causes some increase in temperature. As the temperature increases the rate of oxygen absorption also increases, and after the temperature reaches a certain critical point carbon dioxide and water are given. If the conditions are favorable this process may extend to the point of ignition.

As the process initially depends on the action of atmospheric oxygen on the coal, this action will take place only on the surface of the coal. The ratio of the surface to the mass is enormously increased as the size of the individual particles is decreased. Consequently the finer the state of division of the coal, the more rapid the spontaneous oxidation, and the more rapid the consequent development of heat.

The absorption of oxygen by the coal, although taking place at any temperature, increases as the temperature increases; hence spontaneous heating is more likely to occur if the coal is at a high temperature to start with.

In preparing pulverized coal for use the coal is first dried and then ground. This drying is accomplished by direct heating, and is necessary to get the fine and uniform grinding required for the proper use of the fuel. The coal after passing through the dryer is pulverized while still hot or warm. As the drying and fine grinding are essential to the preparation of the fuel, the logical precaution is to carry on the drying process at as low a temperature as practicable. This not only tends to reduce the chances of spontaneous ignition, but also prevents the direct ignition of the coal in the dryer, which sometimes happens. The efficiency of the drying process need not be lowered materially by the use of lower temperatures, as the rapidity of drying depends not only on the temperature, but also on the rapidity with which the air current passes over the material being dried. It should, therefore, be the aim to get the drying done at comparatively low temperatures and with the use of a strong draught through the dryer. The temperature of the coal coming from the dryer should not exceed 150 deg. F.

The pulverized coal should be stored in metal bins or receptacles sufficiently tight to prevent circulation of air or the entrance of moisture. The amount of pulverized coal kept in storage should be as small as is practical, considering the daily consumption: the reserve of fuel should be stored in the lump condition and not as pulverized coal. In case pulverized coal ignites spontaneously, or from any other

cause, it burns slowly with smouldering combustion, and if kept in tight metal bins is not liable to cause much loss. Fires occurring in this way should be extinguished by washing out the contents of the bin with a stream of water.

In common with other combustible dusts, such as flour, elevator dust, etc., under certain conditions coal dust or pulverized coal is capable of producing violent explosions. This explosive action can take place only when the dust is suspended in the air, and then it requires the contact of a spark or flame for ignition.

Coal dust suspended in the air has somewhat the same risks of fire and explosion as the vapors of inflammable liquids, and much the same precautions must be used to prevent escape of dust clouds into the atmosphere as is taken to prevent escape of inflammable vapors.

Storage bins, dryers, pulverizers and conveyors should be tight to prevent the escape of the pulverized coal into the atmosphere. Coal dust should not be allowed to accumulate on exposed surfaces inside of buildings or in other places where by any means it may be thrown into the air to form a dust cloud.

No lights other than incandescent electric lights provided with heavy guards should be permitted in places where pulverized coal is being prepared, handled or stored. Fires, matches, lanterns or torches should not be permitted in or around pulverizing mills or storage bins.

The inflammability of pulverized coal depends on the proportion of volatile matter in the coal and, therefore, bituminous coal is more dangerous in this respect than anthracite coal, and lignites are more dangerous than bituminous coal. While pulverized anthracite coal is not liable to spontaneous ignition and is less liable to produce dust explosions than other coal, the coal commonly pulverized for use as fuel is bituminous coal or lignite, as pulverized anthracite coal has not yet been successfully applied as a fuel, except when mixed with softer coal.

ELECTRICAL HAZARDS

The report of the Committee on Electrical Hazards, T. S. Potts, Cincinnati, Hamilton & Dayton, chairman, was accepted. The report included proposed instruction cards designed to reduce the fire hazards of electric light and motor installations by giving instructions as to their proper maintenance and operation.

STATISTICAL REPORT OF FIRE LOSSES

E. B. Berry, chief insurance inspector of the Southern Railway, read a report on statistics of fire losses during 1916, which follows in part:

Forty-nine railroads, representing 120,805 miles, reported 5,077 fires in 1916, with a loss of \$4,677,374, an increase of 16 2-3 per cent in the number of fires and 74 4-10 per cent in losses over the previous year. The average loss per fire increased from \$55 to \$921, or 66 per cent, and loss per mile of road increased from \$23.62 to \$38.71, or 64 per cent.

As in previous years, 77 per cent of the entire loss was caused by the six prolific fire breeders:

	Per cent.
Defective electric wiring.....	34
Friction, hot boxes, etc.....	19
Locomotive sparks.....	9
Spontaneous combustion.....	8
Wrecks.....	6
Unknown.....	21

The property loss was divided as follows:

	Per cent.
Elevators.....	30
Rolling stock.....	20
Miscellaneous station buildings.....	12
Merchandise in transit.....	8
Shop property.....	6

The heavy loss in elevator buildings is attributed to the unsettled conditions of the country, and demonstrates the absolute need of thorough and competent watch and patrol service.

The rolling stock risk shows an increased loss of \$226,259 over last year; while a large percentage of the loss is due to the destruction of cars by fire at industrial plants, the psychology of the conditions causing heavy loss in elevator property should act inversely with respect to rolling stock.

Merchandise in transit reporting an increase loss of \$111,632 is accounted for by the very great increase in tonnage handled by the carrier with a very much higher value per ton unit. The loss ratio based on destructible value of the risk is in all probability lower than the past year.

HOSE AND HOSE COUPLINGS

The report of the Committee on Hose and Hose Couplings, F. H. Elmore, Southern Railway, chairman, was accepted. Briefly, it recommended the following:

1. Cotton rubber lined hose where exposed to moisture and rough usage.

Use 2½-in. hose where water pressure and volume and force for handling sufficient.

Use 2-in. and 1½-in. hose where volume and pressure reduced. Nozzle outlets reduced commensurately.

Single jacketed hose, except where severity of service demands double jacketed.

3. Purchase hose with underwriters' specifications and with a five year guarantee of service.

4. (a) Factory test of hose.

(b) Regular service in drills.

(c) Optional periodical test at minimum pressure of 125 lb.

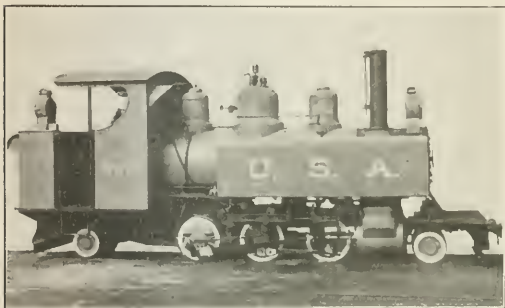
5. Confining use of hose to fire protection purposes. Care and maintenance according to detailed recommendations.

6. A clearing house for both new and old hose and authoritative records of all hose, couplings and threads used.

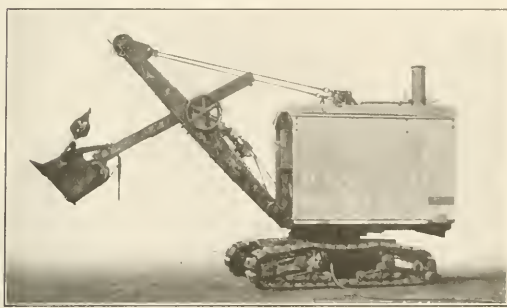
7. Adoption of the national standard, 2½-in. x 3 1/16-in., 7½ threads to the inch, as rapidly as practicable and provision of adapters where necessary.

EQUIPMENT FOR THE AMERICAN MILITARY RAILROAD

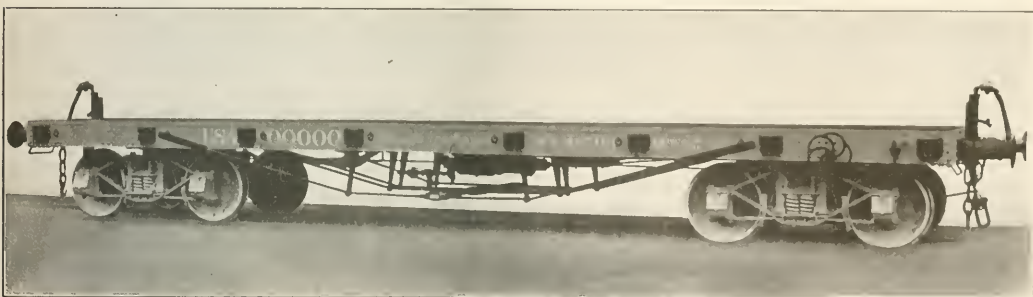
The illustrations show one of the narrow gage locomotives built by the Baldwin Locomotive Works for the United States government for service on the narrow gage lines running up to the trenches at the front; one of the standard gage flat cars built by the Haskell & Barker Car Company, and a crawling traction steam shovel also intended for military



Narrow-gage Locomotive for Light Railway Service in France; Built by Baldwin Locomotive Works



A Steam Shovel for the Railway Engineers; Built by the Marion Steam Shovel Co.



Standard-gage Flat Car of 33 Tons Capacity; Built for Service Overseas by the Haskell & Barker Car Company

Portable reels and standard hose houses for yards; substantial stationary reels in buildings.

2. Unlined linen hose where not exposed to dampness or mechanical injury, and not subject to test.

Use 1½-in. and 2-in. hose according to volume and pressure or size of injector pipes.

Use 2½-in. hose on engines equipped with independent pumps.

Metal racks and reels in buildings; metal rack in cab of switch engines.

railroad and construction work abroad. Under the regulations of the War Department and of the Committee on Public Information regarding the publication of military information, publication of the specifications of this equipment and of the number to be used is prohibited.

HOLLAND'S NEW RAILWAY GUIDE.—An Exchange telegram states that the Dutch Government recently published a new railway guide for the winter. Two-thirds of the express trains and many others have been eliminated.



New Central Station at Tokyo

The Progress of the Japanese Railroads*

Part I.—Development of the System and an Account of
the Present Organization, Traffic, Rates and Problems

By Sukehiko Goto

Civil Engineer for the Imperial Government Railways, Tokyo, Japan.

JAPAN began railway construction nearly half a century later than Europe and America, the first railway laid between Tokyo and Yokohama being opened in 1872. History records that a miniature engine was brought to Japan by Commodore Perry, in 1854, for presentation to the Shogun when his fleet made its first visit to Japan's shores. Some time later a railway concession between Tokyo and Yokohama was negotiated for American interests, but this project was frustrated by the downfall of the Tokugawa government.

Immediately after the restoration the new government laid down a program for a national system of railways, and after considerable delay funds were procured in England to the amount of one million sterling. This resulted in the construction of the 18-mile Tokio-Yokohama line, which was opened to traffic in 1872. Two years later the Kobe-Osaka section, a stretch of 20 miles, was completed and in 1877 it was extended to Kyoto. During the first decade of the railway construction program, work did not proceed as speedily as was at first intended, because of lack of funds, so that in 1882-3 only about 115 miles of line had been built, mainly centered about Tokyo, Osaka and Kyoto.

In 1881, after the government had concluded to encourage private enterprise, the Nippon Railway Company was organized to build a line between Tokyo and Aomori, the northeastern extremity of the main island. Under the concession agreement the government undertook to construct part of the new road and assumed control over construction and finance, including rate-making. In return for a land grant and a guarantee of interest payment up to 8 per cent for 10 to 15 years, the company was obliged to finance 50 per cent of the work and to provide certain reduced cost service. The term of the concession was fixed at 99 years, with the privilege of government purchase after 50 years.

The success of this venture gave impetus to private undertakings, and until 1891 no less than 15 railway projects had been started in different parts of the empire and the lines had attained an aggregate length of 1,071 miles, although the government had later greatly restricted construction subsidies and interest guarantees. Railway ventures met with a check in the crisis of 1890, resulting from a crop failure, while the desire for State purchase came to be increasingly evident in that it became exceedingly difficult to operate certain lines with anything like a fair return upon the investment.

Early in 1891 a state purchase bill was placed before the Imperial Diet, but as a result of a compromise this was

withdrawn in favor of a railway construction act, which was passed the next year. This law authorized the government to float bonds for railway construction, and the purchase of private railways. On the other hand, some of the favorable routes were left open to private enterprise. This law served to encourage private building more than state construction and at the end of 1894 the government owned 580 miles of road, as compared with 1,305 miles in the hands of private interests, while ten years later the relative figures stood at 1,461 miles and 3,231 miles. Although the government was far from satisfied with this state of affairs, no concerted move for government ownership was made until after the war with Russia, when, in March, 1906, a bill for the state purchase of railways was introduced in the Diet, which was finally passed in a somewhat modified shape.

THE PURCHASE LAW

Under the provision of this law the government was authorized to take over 17 private lines at any time between 1906 and 1915 at a purchase price determined by the following formulae:

1. Twenty times the amount obtained by multiplying the cost of construction at the date of purchase by the average rate of net profit on the cost of construction during the six semi-annual business terms of the company from the latter half of 1902 to the first half of 1905 inclusive.

2. A sum obtained by converting at the market price the actual cost of stores into the face value of public loan bonds, excepting purchases made with debentures.

By the term "net profit" in the first clause is meant the balance remaining after deducting from the earnings the operating expenses, bonuses, and the interest accruing from accounts other than the revenue account. The purchase price was to be paid in not less than five years after date of purchase in public loans at face value bearing interest at five per cent.

The purchase of the 17 railways was carried out within 18 months, ending in October, 1907, instead of 10 years. The mileage thus acquired was 2,827 miles and the purchase price, including numerous utilities of an allied character, was about \$240,000,000.

SYSTEM GROWS RAPIDLY

The period from the time of nationalization until 1914 was one of phenomenal expansion of traffic. The mileage increased from 4,444.8 miles to 5,472.7 miles, or 23.1 per cent, and at the same time the mileage of double or multiple tracks increased from 459.5 miles to 739.4 miles. The number of locomotives rose from 1,924 in 1908 to 2,500 in 1914, or 29.8 per cent; the number of passenger cars from 4,989 to 6,458, and of freight cars from 32,242 to 42,705. During the seven years the average weight of locomotives rose from 48.0 tons to 52.9 tons, and the average capacity of freight cars from 7.2 tons to 8.6 tons. The locomotive mileage also

*Part 2: An account of the roadway and equipment practice, construction standards, administration of employees, etc., will appear in a later issue.

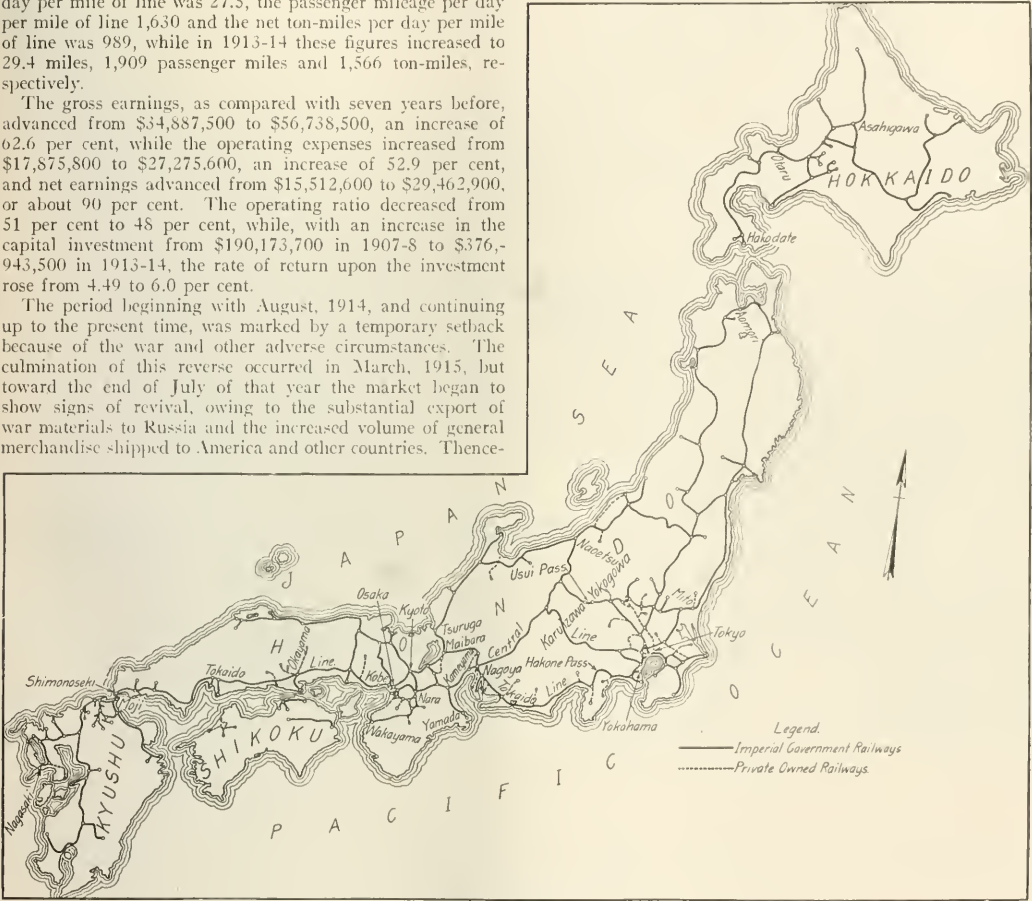
increased from 43,901,036 to 68,744,136 miles and the car mileage from 647,183,493 to 1,212,753,097 miles.

The passenger mileage increased from 2,353,270,765 to 3,690,964,619, a gain of 47.5 per cent, and the ton-mileage from 1,441,125,011 to 3,053,842,638, or more than double the figures of seven years previous. The density of traffic was also marked. In 1907-8 the number of train-miles per day per mile of line was 27.5, the passenger mileage per day per mile of line 1,630 and the net ton-miles per day per mile of line was 989, while in 1913-14 these figures increased to 29.4 miles, 1,909 passenger miles and 1,566 ton-miles, respectively.

The gross earnings, as compared with seven years before, advanced from \$34,887,500 to \$56,738,500, an increase of 62.6 per cent, while the operating expenses increased from \$17,875,800 to \$27,275,600, an increase of 52.9 per cent, and net earnings advanced from \$15,512,600 to \$29,462,900, or about 90 per cent. The operating ratio decreased from 51 per cent to 48 per cent, while, with an increase in the capital investment from \$190,173,700 in 1907-8 to \$376,943,500 in 1913-14, the rate of return upon the investment rose from 4.49 to 6.0 per cent.

The period beginning with August, 1914, and continuing up to the present time, was marked by a temporary setback because of the war and other adverse circumstances. The culmination of this reverse occurred in March, 1915, but toward the end of July of that year the market began to show signs of revival, owing to the substantial export of war materials to Russia and the increased volume of general merchandise shipped to America and other countries. There-

Through trains provided with dining and sleeping car service are regularly run on all the trunk lines, of which the daily train de luxe between Tokyo and Shimonoseki is most notable. This is scheduled to make connections with the Korea-Manchuria through train and the train on the Chinese Eastern railway to facilitate overland communications with Europe via Korea, Manchuria and Siberia. A train is also



Map of Japan

forward the monthly returns have marked a steady increase up to the present.

Traffic returns for the year ending March 31, 1916,

Item.	Year under review.	Increase against preceding year.
Passengers carried	165,780,903	5,384,681
Tons of freight hauled	35,231,896	338,787
Earnings from passenger traffic	\$30,117,600	\$2,676,000
Earnings from freight traffic	\$30,446,000	\$3,442,000
Total	\$60,563,000	\$6,118,000

While endeavoring to promote the growth of traffic and insure the profitable operation of the lines, the railway management has made material efforts to improve the passenger and other service in the direction of safety, speed and comfort. The speeds of passenger trains have been increased materially and the size and weight of the cars have been increased so that they are now practically of the same dimensions as those in use on English railways.

run on the line between Tokyo and Tsuruga, a port on the Japan sea, to effect a connection with Vladivostok and the trans-Siberian route.

Recent years have witnessed the electrification of a substantial mileage of urban and suburban lines. Electric trains are now run between Tokyo and Yokohama, an additional double track line having been built for that purpose. The Yamanote line, which connects Tokyo and Ueno station, north Metropolitan terminus, has also been electrified for the convenience of through passengers.

The ferry service between Japan proper and Korea, the main island and the islands of Shikoku and the Hokkaido is operated by the railways. Thirty-six steamers are in the service and about 2,000,000 passengers and 800,000 tons of freight are handled annually. Car ferry service was also inaugurated a few days ago as a connecting link between the main island and the island of Kyu-shu.

PASSENGER FARES

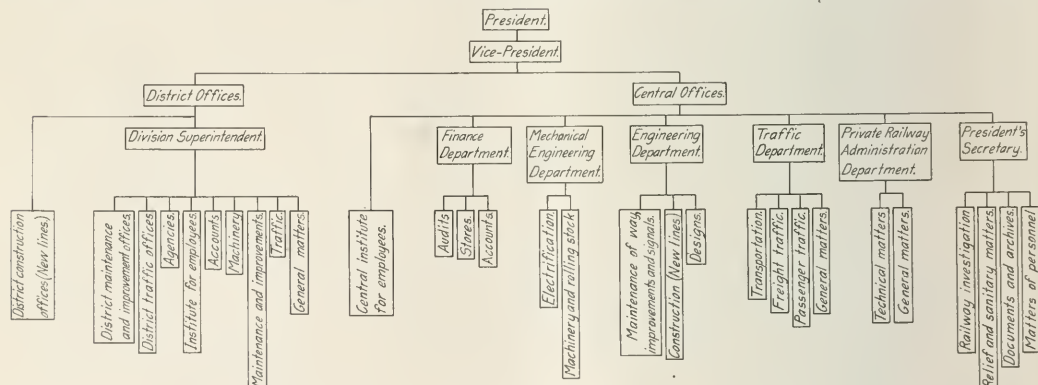
When the private railways were nationalized and brought under uniform control in 1907, the passenger fares on the purchased lines were fundamentally remodeled, a tapering system being adopted. This brought about a substantial reduction in all rates, particularly for long distance travel. The fare per mile for third-class was fixed at 0.87 cents for distances under 50 miles, 0.65 cents for distances between 50 and 100 miles, 0.5 cents between 100 to 200 miles, 0.4 cents between 200 to 300 miles, and 0.35 cents for distances above 300 miles. The rate for second-class was reduced from 175 per cent to 150 per cent of the third-class, and the first-class from 300 per cent to 250 per cent of the third. A transit tax imposed upon all tickets is collected by the railways and paid into the treasury. An extra charge is made for passage on limited trains. For suburban travel, commutation and season tickets are sold at reduced rates, an 80 per cent discount being accorded to school children. The limit of free baggage is fixed at about 40 lb. for the third-class, about 80 lb. for the second-class and about 133 lb. for first-class.

The effects of the reduction of fares, especially on long distance travel under the new tariff, are indicated in a comparison of the traffic revenue during the years 1907-08 to that of 1908-09. In 1907-08, when the new tariff was in operation for six months, the number of passengers per mile of

zone. The terminal charge, which was uniform under the old system, was differentiated according to distance, a substantial reduction being effected in the charge upon short haul traffic. At the same time the distinction between terminal and transportation charges was abolished in accounting the rates. The carload consignment was graded into three classes, different rates being adopted for the different classes in consideration of the relative ability of each class to bear the charge, while specially reduced rates were provided for the first-class goods, which comprise practically 90 per cent of the whole volume of the freight traffic.

The new classification distinguishes four grades: quick service, less-than-carload (kin [3.4 lb.] rates applicable), less-than-carload (ton rates applicable) and carload. The first is for quick service on freight trains and has the advantage of free cartage within the radius of four miles of the destination. The second is for shipments to which kin rates are applicable, the minimum rates being for 67 lb. The third applies to heavy goods measured in terms of tons, and the tariffs thereon are relatively cheap. The carload grade applies to freight of five tons and more received as one shipment.

The classification of goods consists of a first-class, including cereals, coal, cement, timber, stone, salt and manures; a second-class, including sugar, tea, cotton, young shoots and fruits; a third-class, containing pottery, porcelain, furniture,



Organization Chart

line was 25,790 more than in the preceding year, but the average earnings per passenger fell off by 2.6 cents and the average per passenger per mile by 0.01 cent.

FREIGHT RATES

The railroads provide a parcel service handled on passenger trains which corresponds to the express service in the United States, and provides for free delivery within specified limits. The existing rates were adopted in 1905. The minimum rates are fixed at 2.6 cents per pound, applicable uniformly to all distances within 700 miles and 3 cents above 700 miles, the rates being increased on a mileage tapering system with the increase in weight and distance. Double the ordinary rates are levied upon perishable and bulky commodities like paper work, lacquerware, glasses, hats and caps, light utensils and machines.

In October, 1912, a new freight tariff was put into force which was applicable uniformly to all the state lines in the Empire, with the exception of the San-yo line, where a special tariff was adopted in view of competition with the sea route. The Belgian tapering system, based on the zone system, was adopted for the new tariff, which was framed upon the basis of certain fixed rates with an increase for each additional

fabrics, liquor, cakes, etc., and the high-class, including silk, watches, clocks, raw fish, drugs, etc. There is also a special class, having six subdivisions—that including cattle and horses, petroleum and matches, vehicles, corpses, silver and gold currency, bank notes and gunpowder.

Owing to the favorable business conditions, as well as the stimulus accorded by the reduced tariffs, the aggregate freight earnings for 1912-13 showed an improvement of \$1,850,000, or 4.3 per cent, on the figures of the preceding year, though the average rates per ton fell off by 2 cents and the average per ton mile by 0.055 cents. An increase of 27 per cent in the average mileage of freight per ton was also realized, due partly to the growth of long distance traffic encouraged by the reduced rates and the consequent extension of markets.

INTERNATIONAL TRAFFIC ARRANGEMENTS

The government railways have entered into joint traffic conventions with a number of steamship lines touching at the islands. Immediately after the Russo-Japanese war negotiations were opened with Russia with a view to realizing the rail-and-water connection between Europe and Eastern Asia, and in consequence the following through passenger traffics have been put in force: (1) Manchurian-Japanese through traffic, between Japan and North Manchuria (Rus-

sian sphere of influence) and the Maritime Province; (2) Russo-Japanese through traffic, between Japan and Russia; (3) international through traffic between Japan and western Europe (now interrupted by the war).

The through freight service between Japan and Russia is but of recent inauguration, and as such its scope is limited as compared with the passenger traffic. At present two through freight services are in operation, viz., the Manchuria-Japanese through traffic between Japan and Manchuria and the Maritime Province and the through shipment of silk between Japan and European Russia. During 1914-15, 597,370 lb. of cotton yarns, 4,992,573 lb. of cotton tissue and 291,803 lb. of shirtings and knitted goods were carried under this traffic. The through transport of silk can be made in three weeks over the trans-Siberian route, as compared with 65 days spent on the Suez route. The Japan-China through traffic now provides only for the conveyance of passengers and their baggage, the freight traffic service being now under negotiation.

TRAFFIC STATISTICS

March, April and May are months of brisk tourist traffic because of spring pleasure trips, student excursions and religious pilgrimages. After an interval of about two months of stagnation during the rainy season, a general quickening



Fighting Snow

of business again takes place with the advent of the summer season. Another period of prosperous business occurs in October and early November, months of calm, fine weather when all railway lines are crowded from day to day by picknickers. Tourist traffic is regarded as one of the most important sources of revenue, as may be seen from the following table, showing the growth of party passenger traffic during the past five years:

	No. of Tickets Sold	No. of passengers carried one mile under discount party fares.	Earnings from sale of discount party passenger tickets.
1914-15	45,353	3,895,718	\$909,000
1913-14	49,230	3,878,857	1,103,000
1912-13	42,321	3,968,758	1,126,000
1911-12	35,349	2,745,193	839,000
1910-11	38,760	3,560,546	665,000

A comparative statement of traffic in some leading commodities in 1914-15 follow:

Description.	Tons.	Earnings.
Rice	1,392,785	\$1,232,000
Wheat	398,409	265,000
Salt	351,447	210,000
Iron and steel	240,130	227,000
Charcoal	572,516	554,000
Timber	2,468,718	2,043,000
Stone	490,945	266,000
Petroleum	309,266	399,000
Coal	14,453,384	6,118,000
Minerals	555,186	474,000
Fertilizers	436,508	330,000
Bean refuse	363,630	266,000
Raw fish	327,113	912,000
Salted and dried fish	262,039	465,000
Cocoons	122,492	288,000
Cotton cloth	191,456	411,000
Live stock	208,027	298,000

One of the peculiar features of Japanese railways down to recent years was that passenger revenue was greater than that from freight traffic. This disparity has, however, been steadily disappearing since the nationalization of the roads and freight earnings have exceeded those of passengers for the three years past, as follows:

	Passenger Earnings Per Cent.	Freight Earnings Per Cent.
1907-8	56	44
1908-9	54	46
1909-10	53	47
1910-11	53	47
1911-12	53	47
1912-13	49	51
1913-14	49	51
1914-15	49	51

ORGANIZATION

Prior to the railway nationalization, there were two government bureaux in charge of railway affairs, both under the jurisdiction of the department of communications. One had general supervision of both state and private railways and the other was responsible for the operation, maintenance



Interior of First Class Sleeping Car

and construction of state lines. The two departments were consolidated in 1908, and the Imperial Railway Board was created, the jurisdiction of the Imperial government railways being thereby transferred to the direct control of the Minister President of State.

Simultaneously, radical changes were effected in the internal organization of the Imperial government railways, which had so far been managed upon a departmental system. This system worked very well, so long as the operation of State lines was a comparatively small business, but with the sudden increase in mileage realized by the purchase of all trunk lines in the Empire, it was found decidedly inadequate. The centralization system was accordingly abandoned in favor of a divisional one. Under the new system the lines were divided into five different divisions (three for the main island and one each for the islands of Kyushu and Hokkaido). The chart shows the existing organization of the Imperial Government Railways.

RAILWAY PROBLEMS

The railway accounts law provides that the Imperial Government Railways must finance new extensions and improvements from earnings. The annual surplus set apart for this

purpose during the last six years averages a little more than \$8,000,000, while between \$15,000,000 and \$30,000,000 has been expended annually upon construction and improvement work. The result is a deficit of from 10 or 15 million dollars in the capital account. So far, the balance in the capital outlay has been met with temporary appropriations from the postal savings deposits, the accounts being subsequently cleared by the issuance of short term treasury bills and the flotation of foreign loans. The present cabinet has adopted a new policy whereby the annual sinking fund installment has been curtailed from \$25,000,000 to \$15,000,000, the balance of \$10,000,000 being allocated to railway purposes. This departure from the basic principle of the railway independence has elicited serious opposition in the legislature, but it seems to be recognized on all sides that the continuation of the work specified in the government program would otherwise be impossible under the circumstances, unless a radical change should be effected in the general policy of railway nationalization.

According to official estimates for the continuing expenditure, as passed in the recent session of the Diet, until 1927, the government railways will have expended upon construc-

of locomotives of heavy types and greater speed, very little effort has been made, owing to lack of funds, to improve the tracks, the greater part of which are still laid with 60-lb. rail, only 10 per cent of the total mileage having been replaced by 75-lb. rail. The bridges, too, especially those on the lines which were built prior to 1907, suffer much from overstress. Under the circumstances it is found impossible to insure the safety of train service without limiting the operation of heavy engines to certain lines or issuing slow orders. The tunnels, too, are in bad shape and many of them are in urgent need of reconstruction.

The double-tracking of the existing lines is now being prosecuted energetically on certain sections with a view to accommodating a train movement commensurate with the present and prospective requirements of the growing traffic. The elimination of curves and gradients also claims immediate attention, and a number of reconstruction projects are now under way.

Three-quarters of a million dollars will be required to complete the remaining portion of the metropolitan improvements, which consist in building overhead urban lines and connecting the two leading stations in Tokyo. In view of



Electrified Line Under Construction Between Tokio and Yokohama

tion and improvement work a sum of \$408,700,000. Practically three-fourths of the annual installments of the expenditure will be devoted to the betterment of the existing tracks and structures, only one-fourth being expended for new extensions. The reasons for apportioning the expenditure in this ratio may be said to be quite sound, as the growth of traffic points to the pressing need for bringing the lines to a higher standard of efficiency.

The improvement expenditure to be disbursed down to 1927 is made up as follows:

Tracks and structures	\$112,085,000
Electricity	7,529,000
Rolling stock	24,000,000
Shops	4,200,000
Floating equipment	950,000
Total	\$148,764,000

"Tracks and Structures" implies the adding of second or multiple tracks to the existing lines, the building of branch lines and connections, the re-location of parts of the lines, grade separation, terminal improvements, the betterment of tracks and the strengthening of bridges and culverts.

One of the striking features of the railways is the inadequate condition of the tracks in contrast with the high efficiency of motive power. This is chiefly due to the fact that, while the continual growth of train loads and the consequent demand for greater tractive power have led to the adoption

of the increase in the train length and in the frequency of train service, the enlargement of station accommodations has become a matter of urgent necessity at several business centers in the empire. Work is now in progress on the rearrangement and extension of platforms, and of passing and yard tracks, and the enlargement of office buildings and other structures.

The railways require new equipment to the extent of 90 locomotives, 80 passenger cars and 1,500 freight cars each year. Complaints are current yearly because of the congestion of traffic due to the car shortage, especially at the time of the brisk movement of traffic in rice produce and fertilizers, as well as during the year-end season. Two-thirds of the passenger cars are of the small four-wheel type, which the authorities are desirous of superseding with six-wheel cars as soon as money is procured and a plan is devised to dispose of the old equipment taken out of service.

Referring next to the new extensions which represent the construction of 1,200 miles of railway and light railway lines, it is the hope of the railway authorities that the existing policy of starting many different lines at the same time under the pressure of local demands will be abandoned. Under this policy, the funds to be allotted for each line are necessarily scanty, and accordingly the construction work can be but slow, and obviously involves a serious waste. Here-

after it is proposed to pursue a policy of concentration whereby only a few lines will be taken up for construction at a time, and not until they are finished will work on others be started.

STANDARDIZATION OF GAGE

The improvement plans under consideration raise the question of gage which has long been a standing problem. The present narrow gage of 3 ft. 8 in. was adopted during the infancy of Japanese railways when the conditions of the country hardly warranted the building of heavier lines. With the industrial growth of the country the narrow gage was found inadequate and the question of gage conversion appeared in the Diet in as early as 1896. In 1905 the government was approached by E. H. Harriman with the proposal of financing the gage-widening work, but the offer was not entertained on account of the unsatisfactory conditions of the proposed loan, and the scheme remained in abeyance for several years.

In November, 1910, the government appointed the Broad Gage Investigation Commission, which, after several months of thorough and exhaustive study, submitted a report, recommending the completion of the work in the course of 12 years. In August of the same year a ministerial change took place; the next cabinet was against the scheme, and with the dissolution of the committee in December, 1911, the scheme was shelved indefinitely on the ground that there were no resources to finance the undertaking.

On the inauguration of the present government in 1914 the Railway Board was ordered to resume investigations, the results of which were laid before the cabinet in December, 1915. This scheme proposed that the reconstruction of the Tokyo-Shimonoseki line be completed in the course of 12 years with the cost of \$150,000,000, and the other trunk lines in the main island (except the Sobu line) in 25 years with an expenditure of \$299,000,000.

In April, 1916, another gage committee was organized with Count Okuma as chairman, who is quoted as follows:

"There is no longer any doubt as to the necessity of gage-widening work, though the commencement of the undertaking had long been delayed for financial reasons." A suggestion has been made that a portion of the government railways should be transferred to private ownership mainly for financial reasons, the government devoting itself to the improvement of the lines under its control, while the extension of the railways should be left to private enterprises. Under such an arrangement, if adopted, it would probably be found necessary for the government to give some assistance in the construction of new lines."

The deliberations are now in progress and it is expected that the committee will be able to arrive at a decision before long.

INDIAN RAILWAY DEVELOPMENT.—The Railway Board of India has sanctioned a survey by the Eastern Bengal Railway for a 5 ft. 6 in. gage line from Birganj on the Lalgola branch of the railway to Krishnagar via Santipur with an extension to the Bhagirathi River opposite Nabadwip.

RAILROAD CONSTRUCTION IN DONETS BASIN.—A council of mine owners in Donets Basin of Southern Russia has prepared a list of 28 lines, the construction of which is regarded as necessary for the development of the mining industry. Among the most extensive of the proposed roads are the following: Connecting Tschervokva with Matvejev-Kurgan (50 miles); from the station Tasinovataza to the station Nikitovka (20 miles); Nasveteitch to Tama (20 miles); connecting the station Gratchi with the station Eka-terinskaya (14 miles); connecting Grishino with Krematorsky (10 miles). A number of companies in the Donets Basin have completed grading new roadbeds, but can not complete construction work because no rails are obtainable.

RAILWAY MEN OUT TO BEAT THEIR LIBERTY LOAN RECORD

The railways, under the direction of the Liberty Loan Committee on Railroads headed by President Smith of the New York Central, have started a new nation-wide campaign to enlist subscribers for the Second Liberty Loan. With the assistance of a vast series of local organizations of officers and employees, the committee hopes to double the subscriptions made by railway men in the First Liberty Loan, when 241,280 employees subscribed for \$20,027,966 in bonds. This amount was in addition to approximately \$50,000,000 in bonds taken in large blocks by the railroad companies, and wide scattering of the securities to employees was made possible through the arrangements made for payments in installments from the weekly or monthly pay rolls.

The committee has sent telegrams to over 500 railroad presidents throughout the United States urging special organized effort for the sale of the Liberty Bonds. The telegrams said:

"The Liberty Loan Committee, under direction of the Secretary of the Treasury, again requests the undersigned to ask your support in selling Liberty Loan Bonds to railway officers and employees of every grade. It is deemed desirable to make a concerted effort by all roads in the country to put the opportunity equally before all, along the general lines adopted with respect to the First Liberty Loan, offered last spring. Your Committee's experience emphasizes the importance of prompt and thorough *special organizations* in order to obtain effective results. Please wire if you will co-operate."

The telegrams were signed by the members of the committee as follows: A. H. Smith, president of the New York Central, chairman; F. D. Underwood, president of the Erie; W. H. Truesdale, president of the Delaware, Lackawanna & Western; Henry Walters, chairman of the board of the Atlantic Coast Line; Walker D. Hines, acting chairman of the executive committee and general counsel of the Santa Fe; L. F. Loree, president of the Delaware & Hudson; John D. Dennis of the New York banking firm of Blair & Co. and H. W. Burnham of the New York Central, who is secretary of the committee.

Responses from railroad executives pledging hearty co-operation and the formation of special organizations for the bond selling have come in sufficient volume to indicate a practically unanimous effort, and one that with the advantage of previous experience, promises to surpass former results. The Committee on Railroads has set October 27 as the final date on which subscriptions may be received.

The energies of all the vast executive organizations of the American Railroads, numbering nearly 1,000 separate companies, large and small, will be impressed in to the bond selling campaign throughout the next three weeks. Circulars, subscription blanks and advertising matter will be distributed to every individual railroad employee. Under the plan for special organizations, this will be followed up by personal work in charge of local committees of both officers and employees. Employing officers in all of the various departments of transportation service, in the field as well as in offices, will be instructed to bring the matter of contributing to the nation's war sinews to the personal attention of every man and woman who is able to make a subscription.

The campaign will be conducted from the offices of President Smith at the Grand Central Terminal, New York, where constant reports will be received on the progress of the work.

HOW VARIOUS RANKS SUBSCRIBED TO THE FIRST LOAN

Detailed reports from 67 of the leading railroad companies give the percentage of the total number of employees in

various departments of transportation service who subscribed to the first Liberty Loan as follows:

General officers, executives, 33.4 per cent; legal department, 45 per cent; traffic department, 41.7 per cent; accounting department, 29 per cent; transportation department (a) engineers, 17.7 per cent, (b) firemen, 12 per cent, (c) conductors, 18 per cent, (d) agents, operators and station forces, 12.6 per cent, others, 16.5 per cent; locomotive department, 13.8 per cent; car department, 12.8 per cent; maintenance of way department, 1 per cent; all other employees, 16.7 per cent. Average percentage of all employees subscribing, 12.4 per cent.

PENNSYLVANIA SYSTEM WANTS 100,000 SUBSCRIBERS

The second Liberty Loan campaign among the employees of the Pennsylvania Railroad was inaugurated Tuesday morning with an address by President Samuel Rea, delivered at a meeting of about 200 officers of the company, held in the Y. M. C. A. building, Philadelphia.

Mr. Rea pledged the support of the management to aid the government in making the loan a success, and urged full co-operation on the part of all employees.

Other addresses were made by Vice-Presidents Henry Tatnall, W. H. Myers, and A. J. County; by Captain John P. Green, retired vice-president, James F. Fahnestock, treasurer, and R. L. O'Donnel, assistant general manager. J. C. Johnson, superintendent of telegraph, presided.

Mr. Fahnestock referred to the fact that 53,160 employees of the Pennsylvania Railroad subscribed to a total of \$3,440,600 of the bonds of the First Liberty Loan. He urged that every effort should be made to double this record with the Second Loan, and to obtain not less than 100,000 subscriptions for at least \$7,000,000 worth of the new bonds.

B. C. Henion, assistant auditor of disbursements, and chairman of the special Liberty Loan committee of the company, explained in detail the plans for conducting the campaign.

Those in attendance at the meeting were the officers of the company who have been designated to take active charge of the field work of the campaign, on all parts of the Pennsylvania Railroad Lines East of Pittsburgh and Erie. Each division, shop and department was represented, and general instructions were issued for all.

Approximately 65 committees will be organized to cover all portions of the railroad, and, altogether, upward of 1,000 men will be enlisted in the work of personal solicitation. It is part of the plan to make a personal and individual appeal, within a week at the latest, to each of the 160,000 employees on the Lines East, urging every one to become the purchaser of at least one bond of the Second Liberty Loan.

ADVERTISING THE LIBERTY LOAN

Roads the country over are bringing the advantages of subscribing to the Liberty Loan to their patrons at every occasion. They have put placards in their cars, put up posters and enormous banners in their stations; the Pennsylvania has even hung large signs on its ferry boats in New York harbor. In many stations booths have been erected for the use of the bond salesman. In the Grand Central Terminal in New York part of the big information counter in the center of the concourse has been turned over for that purpose. In the North and South stations in Boston, little Liberty Loan cottages have been built where the hurrying commuter may stop and arrange with the representatives of one of the banks for a subscription on the installment plan.

The Railroads' War Board has addressed a bulletin to the railroads stating that the director of publicity of the Treasury Department has requested the co-operation of the railroads operating dining cars to the extent that they have printed on the top of every menu card up to October 27, the date

on which the second Liberty Loan closes, the following: "Help your government win the war. Buy Liberty Bonds now." The War Board suggests this co-operation by the railroads.

COMPANY SUBSCRIPTIONS

A number of roads have already announced subscriptions to the Second Issue of the Liberty Loan on their own account. Among these roads are the following:

Atchison, Topeka & Santa Fe.....	\$5,000,000
Chesapeake & Ohio.....	500,000
Chicago, Burlington & Quincy.....	5,000,000
Delaware, Lackawanna & Western.....	4,000,000
Lehigh Valley.....	1,500,000
Missouri Pacific.....	1,000,000
Nashville, Chattanooga & St. Louis.....	250,000
Norfolk & Western.....	5,000,000
Northern Pacific.....	5,000,000
Southern Pacific.....	5,000,000
Union Pacific.....	5,000,000

KANSAS CITY SOUTHERN OPERATING PERFORMANCE

The Kansas City Southern has been making an excellent record from an operating standpoint during the past few months, showing large increases in gross and net train load in the prevailing direction of movement and an important increase in the average miles made per car per day. It will be noted from the table that the gross train load in the direction of prevailing movement has been increased from 1,277 tons for the fiscal year ending June 30, 1913, to 1,531 tons in the year June 30, 1917. In August, 1917, this figure rose to 1,632 tons. However, the greatest improvement has been in the net train load in the direction of prevailing movement. In 1912-1913 this figure was 654 tons, in 1916-1917 it had been increased to 828 tons, while in August, 1917, it was 915 tons or 40 per cent more than in 1912-1913 and 10 per cent more than the average for 1916-1917.

	Average Tons Per Car of Revenue Freight	Gross Train Load	Net Train Load	Avg. Train Load In Prevailing Direction	Avg. Miles Per Car Per Day
1912-1913.....	24.9	1,200	568	Gross 1,277 Net 654	27.1
1915-1916.....	25.8	1,379	628	1,474	36.4
1916-1917.....	26.3	1,373	650	1,531	40.8
1917					
January.....	27.6	1,403	699	1,470	40.1
February.....	27.1	1,370	660	1,559	41.5
March.....	26.8	1,388	663	1,603	43.7
April.....	25.8	1,412	669	1,578	45.0
May.....	27.0	1,378	639	1,576	45.3
June.....	26.7	1,330	623	1,574	47.1
July.....		1,383	635	1,579	46.8
August.....		1,386	638	1,632	45.3

This increase in the net train load has been made possible largely as a result of the better loading of cars. The average number of tons of revenue freight per car in 1912-1913 was 24.9; in 1916-1917 this had been increased to 26.3 while in January, 1917, it had risen to 27.6. In this connection it is interesting to note that although there was an increase of 1,006,312 lb. of merchandise freight handled in August, 1917, over that of the same month of the previous year, this was handled in 141 less cars. The average loading of merchandise per car in August, 1917, was 13,020 lb., an increase of 1,341 lb. over that of the previous year. This comparison shows an increase of 3.6 per cent in the tonnage handled with an average increase in the loading per car of 10.3 per cent and a decrease of 7.1 per cent in the number of cars required.

Another highly satisfactory performance is shown by the average miles made per car per day. In 1912-1913 this was 27.1. In 1915-1916 it had been increased to 36.4 and the following year to 40.8. This increase has been continued through the present calendar year, the maximum movement of 47.1 miles being made in June, 1917.

NO FARE INCREASE IN IRELAND.—The increase of 50 per cent in English railway fares put into force on January 1st last is not in operation in Ireland.



View of one section of the work.

Dragline Used Successfully in Track Depression

New York, Chicago & St. Louis Is Departing From Usual Methods In Lowering Its Line in Cleveland

THE New York, Chicago & St. Louis is now engaged in the separation of grades with the streets on a section of its line in Cleveland, Ohio, which involves the elimination of 24 street crossings at grade with the tracks and the construction of a four-track roadbed below the level of the streets for a distance of $2\frac{1}{2}$ miles in a cut having a maximum depth of 25 ft. The work is located entirely within the city. Thirteen of the 24 crossings will be carried over the tracks on bridges provided at every second street and marginal roads will be provided for the diversion of the traffic of the alternate streets which will be cut off at the right of way line. Two of the bridges will carry street car tracks. Foot bridges will also be provided at other points designated by the city authorities.

A total of 751,000 cu. yd. of material will be excavated for the track depression in addition to about 61,000 cu. yd. for retaining walls and bridge abutments. The project will also require 74,000 cu. yd. of grading for industrial tracks and 25,000 cu. yd. for street embankments. Over 42,250 cu. yd. of concrete will be placed in bridge abutments and retaining walls, requiring the use of 1,802,690 lb. of reinforcing steel. A total of 38,664 ft. of trackage will be provided and 266,330 sq. ft. of brick paving and 16,342 lineal ft. of curbing will be laid in the streets and marginal roads. The temporary bridges necessary for the carrying on of the work involve an expenditure of more than \$95,000 and the expenditures for the moving of water mains, sewers and drains will total more than \$170,000. It is estimated that the cost of the entire project will exceed \$5,000,000. In addition to its magnitude, the work is of particular interest because of the successful use of a dragline excavator under conditions complicated by street crossings, street car tracks, sewers and overhead cable and wire crossings. In spite of such conditions, the excavator has moved an average of 96,000 cu. yd. of material each month, or about 3,200 cu. yd. each day.

The district affected by the improvement extends $2\frac{1}{2}$ miles from Walworth Run on the east to West Ninety-sixth street and Detroit avenue on the west. It is located in the south-

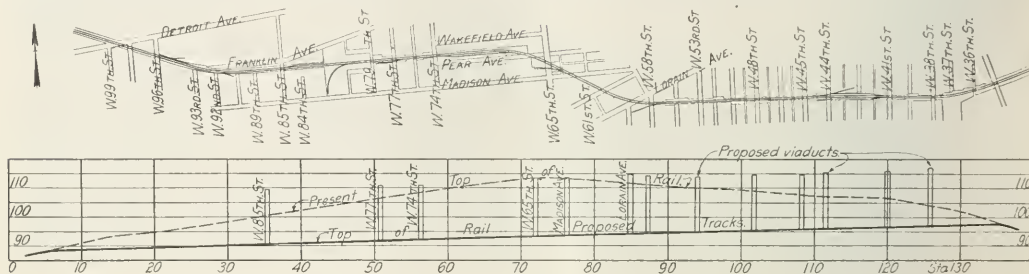
western section of the city in a district already built up solidly with residences, business places and industrial plants so that any plan for improvement presented many difficulties. Because of a summit in the old double-track line located near the center of the work at West Sixty-fifth street, it was impractical to elevate the tracks. It was, therefore, decided to depress them for the entire distance. This decision created the problem of the disposal of the 751,000 cu. yd. of excavated material. It was at first planned to waste the material along the line of the Big Four in a valley called Walworth Run through which the city has built a large sewer, the valley being unoccupied and in an unsightly condition. The first studies which were made for the disposal of the material in this locality were with a view of moving the earth by steam shovels and trains, but as it was found to be impossible to handle the material over the Big Four tracks without serious interference with the regular traffic and as the alinement of the track to the waste bank would have been so irregular as to make it impractical to reach sufficient ground for the disposal of all of the material, this plan was abandoned and it was decided to make the excavation by hydraulic means, utilizing 11,000 ft. of pipe line and pumps designed to discharge 4,000 gal. a minute under a head of 125 ft., as described in the *Railway Age Gazette* of June 16, 1916, page 1335. The equipment for carrying on the work in this manner was secured, but before operations were begun it became desirable to utilize the material from the cut in the double tracking of the Nickel Plate line east of Broadway yard. The decision to utilize excavation in this way made it necessary to load the material on cars. In studying the problem of removing the material and disposing of it all east of the work, it was apparent that if steam shovels were used of sufficient size to load from the bottom of the cut into cars at the elevation of the existing tracks, it would be necessary to dismantle the shovels when passing streets carrying street car tracks. As this situation could be avoided by the use of the dragline and at the same time secure the advantage of utilizing the existing tracks at the old level for the dump cars, thus mak-

ing it possible to handle long trains, such a machine was chosen for the work.

This change in the plans for the disposal of the excavated material after the purchase of the hydraulic equipment left the railroad with a large construction outfit on hand. It is of interest to note that, by taking advantage of the unusual high prices, the railroad has already disposed of the greater part of this equipment for a sum sufficient to nearly cover the investment. With all the material disposed of it is thought

depressed roadbed is being made in two cuts. By shifting the old main tracks to the south where necessary and taking advantage of the additional right-of-way on the north, it was possible to make the first cut while maintaining double track operation for the entire distance east of West Seventy-ninth street, except for a short stretch west of Lorain avenue, where it was necessary to resort to single track because of the diversion of the street car tracks.

The work was begun at the east end with the machine



Layout and Profile of the Grade Separation District

that the change in plans will not result in any appreciable loss from this account.

In making the preliminary studies for the improvement, both two-track and four-track layouts were considered and as the estimates showed a very little difference in the cost of the two schemes and as the cost of changing to a four-track layout after completing a two-track scheme would have been prohibitive, it was decided to construct four tracks at once. In the plans adopted, the bridges are all to be constructed for eight tracks. The four-track prism is being excavated with $1\frac{1}{2}$ to 1 slopes. By installing retaining walls on the right-of-way line and taking out these slopes, the four-

working directly on the surface of the ground as a result of which it experienced no delays in moving over street intersections. The first cut was made on the north and as the work progressed new double tracks were laid behind the dragline and ballasted. Before making the second cut, the traffic will be diverted to this new line.

In addition to the dragline, the equipment consists of three trains of 20 cars each and five locomotives. The cars have a capacity of from 10 to 15 cu. yd. according to the nature of the excavation. The dragline is equipped with a 5-yd. bucket and loads a car in less than three minutes or a train of 20 cars in less than an hour. The dragline averages two and one



One of the Temporary Bridges Built to Carry Street Traffic Across the Cut

track layout may, if necessary at some future time, be expanded to eight tracks.

PLAN OF THE WORK

Before acquiring the additional right-of-way for the project, schemes were considered for the carrying on of the work with as little interference to traffic as possible and with this in view the additional land was acquired on the north of the tracks where practical. East of Sixty-fifth street all the land acquired was so located. The excavation for the

half 50-ft. moves a day and between moves it maintains an average of a bucket load delivered to the cars about every 50 seconds.

The material is loaded into cars standing on a temporary track adjacent to the old main line and, with the exception of 150,000 cu. yd. delivered to the city over the Big Four tracks to make a fill at Walworth avenue, the entire 751,000 cu. yd. is being moved with a maximum haul of three miles east through the Broadway yards and utilized as filling material for double track work. Owing to the plan for providing

space for a temporary loading track, little time has been lost through delays in getting the empty cars to the machine. The efficiency of the operation is best shown in the monthly average of 96,000 cu. yd. of material moved.

As the machine moved through the cut each street crossing is closed as the machine reaches it. Temporary timber bridges have been installed over the first cut at the streets where permanent structures are not to be located. On the return trip, or second cut of the machine, the permanent bridges will be installed at the alternate crossings, which were not provided with temporary bridges after the first passage of the dragline.

In making the first cut, trouble was encountered at West Forty-fifth street where a high-tension transmission line



The Drag Line at Work

crosses over the tracks. The wires at this point would not clear the boom of the machine and, as it was estimated that it would cost \$10,000 to move the line, a short section of the excavation was left in place and was later removed by the company forces with a locomotive crane. At West Fifty-eighth street a temporary bridge was installed with the intention of diverting the street car traffic from Lorain avenue over this bridge so that the excavation through Lorain avenue could be made. Through delay in the delivery of the material it was not possible to make this shift in time and a section containing 12,000 cu. yd. of material was left unexcavated at this point. Later when the shift was made the material was removed by a steam shovel. At West Sixty-fifth street the work was complicated by street car tracks and water mains and at this point the machine moved over the street, leaving the material to be taken out later by a clamshell working from the lower level.

West of West Eightieth street the right-of-way narrows to 66 ft. and when the first cut was completed to this point the dragline was moved to the west end of the work and the north cut was completed with the machine working east. When the dragline arrives at Eightieth street on the return trip it will be moved over and excavate the south cut from that point east. Steam shovels will complete the south cut west of West Eightieth street and will also make the approach grade at the west end of the work.

At nearly all of the intersecting streets water pipes and sewers were encountered. At West Sixty-fifth street a 36-in. low service and a 24-in. high service water line were encountered necessitating carrying the pipes on a trestle. Through the delay of the city in reconstructing the West Fifty-fifth street trunk sewer, which is of brick and 4 ft. by 5 ft. in size, and which will intercept all the sanitary sewers between West Eighty-fifth and West Forty-second streets, considerable trouble was experienced from water and sewage collecting in the open cut. The contractor overcame the trouble at the start by installing pumps behind the machine as he went along. As the work progressed enough pumps

were not available to control the water and the sewage rose above the level of the new grade, interfering with the track laying. To remedy this condition the railroad brought in locomotive cranes and opened drainage ditches at the foot of the slope. In the re-construction of this sewer, which is 45 ft. below the grade of the main track, a start was made by tunneling but the heading south of the track was placed too close to the excavation and as the cut for the track depression reached this point the sewer blew out into it causing a cave-in and making it necessary to drive piling to support the old main line tracks. The sewer work is now being carried on in an open cut.

With the excavation completed a comprehensive scheme for drainage is contemplated. The city will build an intercepting sewer through the length of the cut between the two inside tracks or in the center of the work. While the grade of the cut is all down in a westerly direction, drainage will be effected by a catch basin located at every second street with lateral sewers connecting with the main sewer in the center of the cut. This drainage will be effected by placing the side drains three feet below the surface at streets not provided with catch basins and carrying the drainage each way from such streets with an average drop of about 8 in. to the catch basins.

With the exception of a small amount of concrete which has been placed in the wing walls of a few of the bridges, no masonry work has been started except in the retaining walls for the protection of various industrial plants. This part of



Some Typical Excavation Conditions

the work was described in the *Railway Age Gazette* of June 16, 1916, page 1355.

In designing the bridges a standard plan was followed in all cases where it was physically possible and nine of the 13 structures are to be similar with only minor variations to conform with the differences in the angle of the crossing, curvature of the tracks, etc. The design provides for flat slab spans of I-beams and concrete construction supported on two gravity abutments and three reinforced concrete piers. At square crossings with tangent tracks the clear span between supports is 27 ft., with the tracks spaced at 13 ft. centers, this allows of a 7-ft. clearance from the center of the tracks to the masonry. At skew crossings and when curved tracks are crossed the distance between supports is increased to maintain the standard clearance. Space is provided in the deck for a 34-ft. clear roadway and two sidewalks 10 ft. 11 in. in width. The floor is designed for a uniform load of 100 lb. per sq.

ft. and two 24-ton trucks in any position on the roadway.

The project is being carried on under the general direction of E. E. Hart, chief engineer of the Nickel Plate. W. J. Bergen, first assistant to the chief engineer, is in direct charge of the work and A. C. Harvey, field engineer, is in charge of the field operations. The dragline excavation and the operation of the dirt trains is being handled for the railroad by the Walsh Construction Company of Davenport, Ia.

REPORT ON NORTH BRANFORD COLLISION

The Public Utilities Commission of Connecticut has issued the report of its engineer, John F. Trumbull, on the butting collision of passenger cars on the Shore Line Electric Railway at North Branford, August 13, in which 19 persons were killed and 35 injured. This collision was reported in the *Railway Age Gazette*, August 15, page 299. The west-bound car had run a short distance past a meeting point because the conductor was asleep and the motorman was in a state of mental abstraction. The report says that motorman Negus, according to his own voluntary statement, was in a "dazed" or drowsy condition and oblivious to his surroundings and his duties.

A short distance after passing through a side track (where he should have waited to meet the other car) without realizing the fact, he brought his car nearly to a stop and took on a passenger; and yet neither the motorman nor conductor could recall this incident when giving their testimony. Negus was suddenly restored to animation when he saw the opposing car, coming at 45 miles an hour, and he applied his air brake; but he does not know how he escaped being caught in the wreck. Passengers testify that he ran half the length of the car and jumped off at the center vestibule. The conductor had intentionally gone to sleep, first fixing himself in a comfortable position on a longitudinal seat.

For seven days prior to the collision both the conductor and the motorman had worked long hours, and irregularly. On Sunday, the day before the collision, Negus worked from 7:00 a. m. to 11:10 a. m. and from 3:10 p. m. to 1:40 a. m. the next morning, and in addition was on a car, deadheading, one more hour, or 15 hrs. 40 min. altogether. This combination of day work and night work had been common. There is evidence that Negus did not spend his rest periods in actual rest. The automatic cut-off, the "dead man's handle," designed to stop a car if a motorman should fall asleep, had been tied down so as to be inoperative. Negus said that his arm frequently became tired, holding down the controller handle. On this same trip he had overrun a meeting point at Madison and was called to his senses by the conductor giving him a bell signal. It was then that he tied down the controller. The inspector thinks perhaps he was not so much "dazed" as he was concerned with some personal problem or worry. The conductor, who should have been warned by this mistake at Madison, seems to have let it pass without much thought. He claims to have been subject to dizzy spells, but the testimony of the passengers discredits this claim.

The inspector puts the primary responsibility on Negus and the conductor, Tryon, but adds that "men do not ordinarily become careless, lose their sense of responsibility and wilfully disobey rules that they know are necessary for safety, unless the management of the company also becomes careless and permits violations to go unchecked. . . ."

He recommends the installation of automatic block signals, the adoption of a rule requiring each conductor to exchange signals with his motorman when approaching a meeting point, and other improvements.

The Commission adopts the report of Inspector Trumbull as its own and calls upon the company to exercise more care

in examining the records of the hours of service of men; to never permit men to operate cars who are not fully competent physically, mentally or otherwise and to report by September 18 whether it will accept and adopt these suggestions, and when they will be put in force.

RAILWAY REGIMENTS' TOBACCO FUND

In a short time circular letters will be sent out from the committee in charge of the raising of the Railway Regiments' Tobacco Fund asking railway supply concerns throughout the United States to subscribe to this fund. As announced in the *Railway Age Gazette* for last week, page 618, it is desired to raise for the nine existing railway regiments a total of 2,160 pounds of tobacco weekly, which, it has been ascertained, will cost \$1,080 a week. The appeal to the railway supply concerns will include the following:

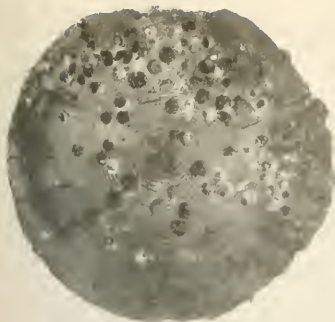
Will you not "do your bit" in connection with this work by entering a subscription for your company on the enclosed card and send it to the undersigned at once? Each railway supply concern to which this letter is addressed is respectfully requested to subscribe \$10 a month for 15 months from October 1, 1917, to January 1, 1919, this subscription to be terminated at an earlier date should the war end before the date mentioned. Checks should be made payable to "John R. Washburn, Treasurer," and mailed to "Samuel O. Dunn, Secretary, Railway Regiments' Tobacco Fund," 750 Transportation Building, Chicago.

The committee in charge of raising the fund, of which F. A. Poor, president of the P. & M. Company, is chairman, estimates that if 450 railway supply concerns will subscribe the \$10 a month requested, a sufficient fund can be raised for providing "smokes" for all the members of the existing nine railway regiments. Additional regiments are now being raised but it will be sometime before they are raised and no effort is being made at present to provide for their probable wants. A list of the railway supply concerns of the country, which will be made as complete as practicable, is now being compiled and as rapidly as possible circulars requesting subscriptions from them will be sent out. Meantime, it is hoped that many supply concerns will not wait to be circularized but will send their subscriptions at once to the secretary who, in turn, will promptly turn the money over to the treasurer.

The members of the committee especially desire it should be understood that all the money raised will go into the Tobacco Fund. There will be no expense connected with the collection and administration of the fund since the concerns represented by the members of the committee have agreed to bear all the clerical, postage, stationery and other expenses incurred in collecting and handling the money.

Some subscriptions to the fund already have been made. It is probable that the first list of subscriptions will be published in the *Railway Age Gazette* and other interested publications next week, and the names of all donors will be published hereafter as their subscriptions are received. "Now is the time to subscribe!"

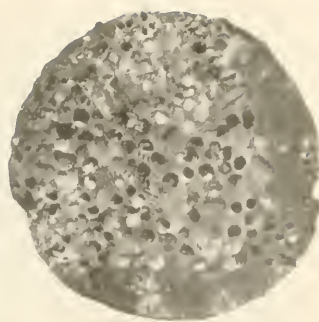
DEMURRAGE REGULATIONS IN IRELAND.—Revised charges and conditions as to freight car demurrage on the Irish railways went into operation on September 1. Two clear days are to be allowed for the unloading of cars containing coal and coke, and one day for unloading merchandise. A demurrage charge of 3s. (\$36) per day for the first two days or portion of a day is to be made if detained beyond the mentioned time, and 6s. (\$72) per day for each day after the first two extra days. Similar charges are to be made against shippers who order cars and then fail to load them within 24 hours after their receipt, or, if loaded, fail to order them away.



Teredo Destroys Improperly Treated Piles

Investigation of Worm-Eaten Douglas
Fir Sticks Discloses Inadequate and
Poorly Distributed Injection of Creosote

By Dr. Hermann von Schrenk
Consulting Timber Engineer, St. Louis, Mo.



Two Piles Destroyed by Teredo.

TWO sections of Douglas fir piling were recently received which were stated to have been treated with creosote and which had been in service about eight or nine years at Tacoma, Wash. Both of these showed that they had been treated with some black preservative. The piles were completely riddled by the teredo, not only in the central untreated portion of the piles, but all through the dark treated portion.

The piles were sectioned at various points, and a careful examination was made of the penetration as indicated by the color (after drying out the sections). This examination showed an average penetration of about 1 in. to 1¼ in. Here and there, however, the penetration was only nominal. At one or two points there was practically no penetration at all. A microscopic examination of the wood fibres at these

per cu. ft. or, for the whole pile, 2.2 lb. per cu. ft. The extracted oils were analyzed, and the average of these analyses gave the following results:

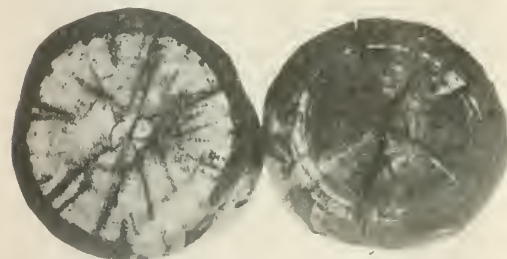
Specific gravity — 1.0151	
Distillation:	
210 deg. C.	1.3
235	6.8
270	33.5
315	11.9
355	24.3
Residue	11.5
Specific gravity 235-315 deg. C. at 38 deg./15.5 deg. C. =	1.020
Specific gravity 315-355 deg. C. at 38 deg./15.5 deg. C. =	1.081
Tar acids	5.2 per cent
Sulphonation 235-315 deg. C.	3.6 per cent
Sulphonation 315-355 deg. C.	2.0 per cent

GENERAL FINDINGS

The chemical characteristics of the preservative indicate that it is in all probability of strictly coal-tar origin; in other words, it has no water-gas tar or other adulterants. Some of the fractions are slightly at variance with the percentage usually found in straight creosote oil, but this is probably accounted for by the fact that in making the extractions certain percentages of the wood fiber and resinous contents normally found in Douglas fir were extracted with it. It was not thought desirable to separate these in view of the general close agreement of the analytical results with those commonly obtained for coal-tar compounds.

The amount of oil used as already shown was given by the two extractions as follows:

	Per cent by weight	Lb. per cu. ft. of treated wood	Lb. per cu. ft. based on whole pile
First extraction	34.0	10.88	3.32
Second extraction	22.3	7.04	2.20



Two Creosoted Douglas Fir Piles Treated After Being Air
Seasoned

points confirmed the visual examination. Small globules of creosote oil appeared in the medullary rays and in an occasional fiber of the summer wood, but practically all of the wood fibers were white and showed no evidence of creosote oil penetration. The distribution of the holes made by the teredo showed the smallest holes in the creosoted portion, the holes increasing in size towards the center of the stick.

Borings were made at various points in the circumference of the piles. A visual examination of these borings indicated that there was apparently more preservative at certain portions of the circumference than at others. Two sets of borings were taken from the creosoted ring, and the oil was extracted from these borings. Using the weight of the dry wood as a basis, the first extraction showed 34 per cent by weight of preservative, or 10.88 lb. of preservative per cu. ft. Calculating the actual volume of the treated wood and taking the whole volume of the pile, the amount of oil per cubic foot, based on the volume of the whole pile, was 3.32 lb. The second extraction showed 22.3 per cent of preservative, based on the dry weight of the wood, or 7.04 lb.

These results indicate clearly that the amount of oil with which these piles were treated was very small. It should be remembered that treating specifications usually require a certain number of pounds per cubic foot, based on the total volume of the material treated. In other words, piles in the Puget Sound district, in order to give anything near proper protection, should have at least 15 to 20 lb. per cu. ft. In view of the fact that Douglas fir can be treated only on the outside, it will readily be seen that, according to the actual amount of oil injected, the portion which is treated would contain far in excess of 15 or 20 lb. per cu. ft.; in other words, the outer portion of the pile which is treated will practically be treated to refusal. This was certainly not the case with the two piles submitted for examination. The amount actually found is probably a little higher than was really the case, because, as stated above, there are probably certain percentages of resin and other extractable materials normally found in Douglas fir.

In view of the fact that these pile sections were immersed in salt water, and from past experience with oils found in piling after eight or nine years of immersion in salt water, we are of the opinion that this light quantity of creosote oil

actually found is fairly indicative of the amount originally injected. By this we mean that evaporative or leaching changes take place so slowly when creosoted wood is submerged that for as short a period as eight or nine years, such loss may be regarded as negligible.

While the penetration was fairly good at most points, there were numerous weak spots at the circumference where the penetration was extremely small. On the photographs there are points where practically no creosote oil is visible. Even the microscope does not disclose any.

Taking the foregoing facts as a basis, it would appear that the reason these piles were so badly decayed and destroyed by the teredo is probably two fold: (1) the amount of oil injected was entirely insufficient to give proper protection; (2) these piles were probably not correctly treated, because they would otherwise have given far better and more uniform penetration.

RECOMMENDATIONS

The lessons to be drawn from an investigation of this sort clearly establish that for successful resistance to the teredo, Douglas fir piles should, wherever possible, be air dried instead of being subjected to the usual boiling treatment. This will very largely obviate the leaving of vulnerable untreated spots in the circumference of the sticks and will at the same time insure a far greater depth of penetration and a larger volume of oil retained than is usually obtained. It has frequently been stated that air seasoning of piling on northern Pacific Coast points is not practicable. I regard this without foundation, however, because piles have been air seasoned in the Puget Sound district and the resultant treatment has been of such superior character that there can be little doubt as to the advantage to be gained by it. One of the photographs shows section of two creosoted Douglas fir sticks, cut 12 ft. from the end, treated after the piles had been thoroughly air seasoned and the very uniform complete penetration of the sap ring should be noted.

It furthermore indicates that our present system of specifying on the basis of so many pounds per cubic foot is a very poor standard for treatment of material like Douglas fir piles. Where a railroad goes to the expense of having material treated, it would be far better if a specification called for a certain depth of penetration irrespective of the quantity of oil injected to obtain it, and make the actual oil used in the treatment the basis of payment, having a possible restriction as to the upper limit of the oil allowable, such limit to be determined on as basis of experience.

It furthermore indicates that the inspection of piling of this character must be carried out by actual borings of a very large number of sticks, and that the method of inspection by which the oil quantity absorbed is judged by gage or other readings is not sufficient.

RAILWAY IN MOROCCO.—In connection with the bill now before the French Parliament for the construction of the railway between Tangiers and Fez, it is pointed out that there already exist 773 km. (480 miles) of railway in Morocco. These are lines actually operating and exclusive of railways under construction. All the lines now operating are narrow-gage (60 centimetres, or 2-ft. gage) military railways, which owing to diplomatic conventions with Germany could not be used for civilian or ordinary traffic up to the outbreak of the war in 1914. France, however, considers herself free from all diplomatic conventions made with Germany, and all lines are now open to ordinary traffic. The traffic receipts per kilometre for the whole of 1916 varied between £740 (\$3,626) and £935 (\$4,582). The proposed Tangiers-Fez line is to be of standard gage. The French Government proposes to give a concession for the whole of the standard gage lines (altogether 670 miles) to a private consortium.

THE FREIGHT CAR AS A FACTOR IN WINNING THE WAR*

By E. H. De Groot, Jr.

Chief of Division of Car Service, Interstate Commerce Commission.

To talk about cars is for me a work of love. My father was a young freight conductor when I was born and all of my life has been spent on or about a railroad. To me the freight car was early a thing of romance and poetry and for me it still holds its charm, notwithstanding a very intimate acquaintance with those perverse characteristics which the operating man finds so much and so often in evidence in his daily experience.

No less an authority than General Joffre has said that the present war is one of transportation, and we all recall the high tribute, as well as the tremendous charge that President Wilson uttered in his appeal of April 15 to the men who run the railways of the country, *** "upon whom rests the immense responsibility of seeing to it that transportation suffers no obstruction, no inefficiency or slackened power."

We must not delude ourselves with the idea that transportation can be furnished as it has been in the past, and that business can be conducted during the war as it has been heretofore. *** The transportation machine has not broken down, as some have asserted, and it is not going to break down. It is assimilating a tremendous aggregate of conglomerated offerings and grinding out more ton-miles than it has ever produced before. As a whole it is being run more efficiently than it has ever been run in all its history, but it must be run with still greater skill—skill progressively greater—as time goes on. * * * But I do not mean that the transportation machine will run without any shocks. On the contrary, I look for pounds and wheezes in many parts before the robins return, and what I want to emphasize is that, more and more, skill and devotion must be forthcoming to offset the increasing difficulties. The crowding of locomotive power, the scarcity of men and materials, the pressure of congested conditions; all these things will make for lower standards in many ways unless resolutely faced and fought; and lowered standards spell inefficiency. We must get the greatest possible output in ton-miles from every individual car. I say individual because I am a little suspicious of averages. They too often cover up disgracefully low accomplishment, and drag down those higher and better. * * * Transportation affects mansion and hovel, rich and poor, alike. It is vital to all. I make this elementary statement because I want to draw from it the conclusion that the business of transportation is one of dignity and necessity and that to serve in the transportation army in this time of national crisis is to enjoy opportunity for a splendid contribution to the cause of our beloved country.

I shall use very few statistics tonight, for my purpose is not to enlighten but to crystalize into adamantine firmness your resolution to play the transportation game through to the end with the same spirit of devotion and sacrifice which we expect from Americans on the firing line in France. 'The Railroads' War Board has told us how the railroads could do more work with existing facilities. * * * In short, the duty of every man in railway service from the humblest to the highest has been made clear over and over again; and for the most part the response has been wholehearted and gratifying. The Commission on Car Service at Washington can give many encouraging examples of heavy loading, double-loading and even triple-loading of cars. Co-operation is an accomplished fact and to an extent which a few months ago would have been unbelievable. Not that the millennium has arrived, for there is yet much room for

*From an address before the New England Railroad Club, Boston, Mass., on October 9, 1917.

improvement on both sides, but very great progress indeed has been made.

I have a pet theory that when the correct answer to the transportation problem is finally worked out it will be found that it is good alike from both the railway standpoint and that of the shipper. Yes, and even beyond that; that the true interests of public and shipper and security-holder and employee are one and the same.

In the meantime, the railroad man and the shipper are each getting a better perspective and as they do so they are throwing fewer stones and doing more planning together. * * * I believe that the time is near when it will be necessary to determine what freight must move and what must be refused. However, the authority to effect this discrimination lies with the President under the priority law, and will undoubtedly be exercised with great care and wisdom.

The freight car has received more attention in the past few months than in all of its previous existence. Its empty mileage and ratio of empty mileage, average miles, repairs, loading, unloading, switching, detentions, billing, reassignment, per diem rate—all and more have been the subject of much study and more discussion.

Great progress has been made. The pooling of box cars under the order of the Commission on Car Service was the greatest advance step taken since 1902 when per diem was adopted. Literally tens of thousands of box cars were actually redistributed to the producing districts by arbitrary order. It is impossible to estimate the increased efficiency which the country has already secured through these measures. Then the Esch law was passed and the Interstate Commerce Commission organized a new division. * * *

As indicated by the commission in its announcement, the Division of Car Service is working very closely with the Commission on Car Service and they are co-operating with us in a most helpful spirit, to the mutual benefit of both shippers and carriers. Your greatest opportunity lies now in speeding up the movement of cars. Watch the yards and terminals, eliminate the delays there, and half of the problem is solved. The price is eternal vigilance. In the last analysis the determining force in making the freight car the tremendous factor which it must be in winning the war is just the plain everyday man—agent and yard clerk and switchman; repairer and trainman and yardmaster—shipper and consignee; and you, and me, and a thousand others. Shall we not do our part? * * *

DISCUSSION

The discussion on Mr. DeGroot's paper was opened by W. C. Kendall, superintendent of transportation of the Boston & Maine, but now serving on the railroads' Car Service Commission at Washington. Mr. Kendall told of the satisfactory progress being made at Washington. The railroads have never worked so closely in co-operation with the Interstate Commerce Commission as now. Complaints of unsatisfactory car service are less numerous than ever before, and the railroad man's life is correspondingly pleasanter. Complaints of all kinds are still sufficiently numerous, however, to keep the transportation men from going to sleep; but, as has been so often observed in the past, a good many of the reported troubles are future and contingent, rather than actual and present. A certain Pittsburgh road, having put on a largely increased corps of inspectors, has succeeded in loading its cars of miscellaneous freight (not including coal and ore) from 53 per cent of their capacity to 88 per cent. A certain large shipper of cement, loading 255 cars of cement in one day recently, put 110 per cent of capacity into 254 of those cars. To the station agent and the ordinary shipper—to all having to deal with the freight car problem—the lesson of today is to follow up every station and every yard, every day, with a fine-tooth comb.

John W. Golden, traffic manager of the Keith Car Manufacturing Company, advocated the establishment of local distributive units. A railroad should be divided into such units, of a size which can be handled as a single proposition in a single day; and the distributor supervising freight car movements in this district should have telegraph or telephone communication, with every point, so as to eliminate completely all delay to messages or in getting answers to questions. This man also should be in constant wire communication with the car-record office of the road, and the car-record office should keep its data close up to the actual car movements at all times.

H. E. Astley, division superintendent of the New York, New Haven & Hartford, at Boston, said that some good work of this kind was already being done on his road. He commended the consignees for their hearty co-operation.

G. L. Graham, traffic manager of the American Woolen Company, Boston, referring to complaints that freight cars are often delayed because the revenue billing did not accompany the car, said that the New Haven road had already started a decided improvement in this matter, and cars coming from connections without revenue billing are not accepted.

In the scarcity of help now felt everywhere we feel the need of some improved apparatus for unloading bulk freight (such, for example, as soft coal) from gondolas which have high sides and no hoppers. Who will produce something of this kind?

The shippers of New England are alive to the situation and are ready to co-operate with the railroads in full loading of cars of miscellaneous freight. New England produces one-seventh of the manufactured goods of the country, and sends out freight in less than carload lots more extensively than any other region. At Lawrence, Mass., there is a plan for co-operation, in expediting shipments, by all the manufacturers in the city. The idea is to combine to send goods to a given city on a given day; all, for example, consolidating their shipments to Cleveland, or to Chicago, so that a full carload may be sent direct to destination. This plan is the outcome of severe losses by delays during the past year. At one time special action had to be taken to release 200 cars of westbound freight which had become blockaded at the Hudson river. In Manchester, England, there is now practically no railroad freight accommodation whatever for the large manufacturers, and to send their products to London they have to use automobiles. New England manufacturers are on the lookout lest their productivity may be diminished by causes which have been felt in Manchester. The co-operative plans of the railroads must be worked to their full extent. If the Boston & Maine, for example, is congested in its direct westbound routes, shippers will demand that goods be sent over the Rutland road, if thereby time can be saved.

L. A. Anthony, superintendent of car service of the Boston & Albany, told of the action taken on his road to expedite freight cars. His force of inspectors has been more than doubled. In spite of the best efforts a hundred cars were discovered, in two months, which had been so delayed that the demurrage bills on them amounted to \$25 or more on each car.

A. G. Thomason, manager of the New England Demurrage Commission, congratulated the railroads on the accomplishment of the long needed and long wished for reforms in car service now manifest on every hand. Mr. Thomason was formerly, for many years, in railroad service, and said he was curious as to the explanation of the recent so-called improvement in the matter of sending revenue waybills with cars. In his experience nobody had ever thought of sending revenue bills in any other way than to get them to destination with, or ahead of, the car.

S. E. Miller, acting superintendent of transportation of the

Boston & Maine, told of the effective co-operation of consignees at stations on his road. There are exceptions to this statement, of course, and to these particular attention is given, personal visits being made where necessary.

W. T. LaMoure, general freight agent of the Boston & Maine, reminded the meeting that the freight traffic men—now supposed by many persons to be doing nothing, because freight comes in faster than it can be dealt with—are helping to keep freight cars moving. The traffic men admit that they are the friends of the public; but the undisputed fact at the present time is that the public is heartily co-operating with the railroads; and the principal difficulty, where there is lack of this co-operation is that there is not a full understanding; the principal lesson for the railroad man who would improve such co-operation is to be always frank and aboveboard in dealing with the shipper or consignee, and in telling him your purposes.

Mr. DeGroot, closing the discussion, expressed his full confidence that the gains in transportation efficiency which are now being accomplished under the stress of war will not be lost. The improvements on which we are now congratulating ourselves are so valuable that backward steps will be impossible.

WASHINGTON CORRESPONDENCE

WASHINGTON, D. C., October 9, 1917.

INCREASED RATE PROCEDURE

That the operation of putting into effect a new tariff containing an increased rate, fare, charge or classification hereafter is to be surrounded with considerable more formality and publicity than formerly, but that a tariff once filed will probably be less liable to disturbance as a result of protests and complaints, is indicated by the announcement made by the Interstate Commerce Commission of a proposed tentative order prescribing the procedure to be followed in securing its approval for the filing of a new tariff. The order, which will be the subject of a hearing at Washington on October 15, as briefly reported in last week's issue, is made necessary by the amendment to section 15 of the commerce act, which became a law on August 9, having been inserted on short notice while the bill to increase the membership of the commission was in conference.

The amendment provides that until January 1, 1920, no increased rate shall be filed except after having been approved by the commission, although such approval may, in the discretion of the commission, be given without formal hearing and in such case shall not affect any subsequent proceeding.

Since the law became effective, at a time when the members of the commission were away on their vacation, the business of filing tariffs has been pretty much at a standstill. Both tariffs and requests from carriers as to how they should go about obtaining the approval of the commission have accumulated in the commission files along with more or less frantic letters and telegrams from shippers excited by the knowledge that definite proposals to increase rates were in existence to which they had no access. Some idea as to how many tariffs have thus been held up may be gained from the fact that in the 12 months ending October 31, 1916, 106,442 separate tariff publications were filed by carriers and this was less by several thousand than the numbers filed during recent years. Tariffs in transit were taken care of by the commission by a blanket order of approval covering those forwarded prior to August 15 and since then the commission has issued notices of approval in some 22 cases, involving principally tariffs filed for the purpose of making corrections.

Heretofore new tariffs have simply been filed and, unless sufficient protest was made to cause the commission to suspend them, have automatically gone into effect. Under the

proposed order requests for approval of the filing of a tariff containing an increased rate must be made by application in a form set forth, and, according to the order:

"Such application must show the rates, fares, charges, and classifications, which it is proposed to increase, including rules or regulations affecting charges, as well as the nature and extent of the increase, the way in which it is to be effected, and the proposed rates, fares, charges, classifications, rules, and regulations of which approval is sought, and must also contain a complete and accurate statement of the reasons advanced by carriers in justification of the increases sought to be established. If the application embraces a number of increases they may be shown in an exhibit attached to and specifically designated in the application. This may be done by using a copy of the effective tariff and showing thereon in red ink the proposed increases, or by using a proof copy of the proposed issue and inserting thereon in red ink the existing rate, fare, etc., or by showing both the existing and proposed rates, fares, etc., in a memorandum either typewritten or manuscript, attached to the application as an exhibit.

"If the existing rates, fares, etc., are under investigation in suspension proceedings, or under attack in any formal proceeding pending before the commission or if the proposed rates, fares, etc., are predicated upon the commission's findings in any adjudicated proceeding, applications should so indicate by proper reference to the docket numbers of such cases. If the existing rates, fares, etc., are protected by any pending fourth section application reference must be made thereto. "If the commission declines to approve an application and the carrier presents a new application based upon new facts in justification of the proposed increases, such modified application should specifically refer to the previous application and order number declining the same.

"Whenever it is thought that maps would be helpful in presenting the rate situation, they may be employed for purposes of illustration, be designated as exhibits and be attached to the application.

"If the increases sought to be established bear a relationship to the rates, fares, etc., of another carrier or carriers, or to and from other points or localities, or if they bear an established relationship to rates on other commodity or commodities, or if increases are proposed for the purpose of removing discriminations or fourth section violations, applications should state the fact and definitely explain such relationship or fact.

"In instances where the commission has in formal proceedings approved specific rates, fares, charges or classifications it is not necessary to secure further approval, but schedules containing such rates, fares, etc., should specifically refer to the authority therefor in the manner required by Tariff Circulars No. 18-A and No. 19-A or later issues.

"Five copies of each application should be presented to the commission, but where it requires more than 20 pages to set forth the increases sought to be made, it will be sufficient to present two copies of the exhibit referred to and made a part of an application.

"Each application must show the names of the carriers for and on behalf of which it is made, or if made on behalf of all carriers parties to a particular tariff or classification, may refer by I. C. C. number to such tariff or classification, and must be over the signature of an executive officer, a responsible traffic officer or a duly authorized attorney and agent, specifying his title, and must be sworn to before an official qualified to administer oaths."

While these requirements will naturally make it more difficult than at present to get an increased rate on file, and will also add considerably to the work of the commission, it would seem a matter of course that after the commission has had an opportunity to analyze a proposed increase in advance and perhaps to hold a hearing on it, there will be

less likelihood of its being suspended after approval for filing is given, although if additional facts should be brought to the attention of the commission by shippers to warrant such a procedure, there is nothing to prevent such a suspension.

The commission has gained the power, if it deems it wise to exercise it, of absolutely preventing even the filing of an increased rate, but as it already had the power to prevent such a rate becoming effective, the real change in the situation in this respect is apparently rather unsubstantial.

Shippers have been worrying considerably for fear that, the commission once having passed on an application for approval of the filing of a tariff, it would be reluctant to reconsider the same tariff later, and have been advocating some method by which they can be enabled to know the contents of the carriers' applications in time to make protest. In order, therefore, to apprise interested shippers of the applications presented by carriers for permission to file increased rates, the commission calls attention to the fact that the proposed order requires that five copies of each application shall be presented to the commission, and, in all cases, at least a duplicate copy of all exhibits incorporated therewith. According to the plan, one application containing copies of all the exhibits will be open for consultation by the public in the commission's public tariff file rooms and there will be laid daily on the table in the press room and also posted on the secretary's bulletin board, notices indicating applications received to file tariffs carrying increased rates, such notices indicating in brief the tariffs and territory affected.

The commission also has in mind arranging to mail weekly to accredited representatives of organizations of shippers, chambers of commerce or boards of trade similar lists of the applications received, indicating those that may have been acted upon.

The commission also expresses the view in its announcement that carriers should consult freely with shippers who may be interested in proposed increases. It believes that the course now pursued by the classification committees in that regard, by which hearings are held for the benefit of shippers on proposed changes, following the commission's suggestions in its report on the Western Classification Committee case, has resulted in a better understanding between shippers and carriers, and that similar conferences on prospective changes in rates, fares, or charges will serve to reduce or remove much of the friction and difference of opinion hitherto existing between shippers and carriers. It is also thought that conferences between the parties will greatly simplify and expedite the disposition of applications by the commission, and will have a tendency to reduce protests and requests for suspension, and the number of formal complaints filed with the commission.

NEW COMMISSIONERS CONFIRMED

The Senate on October 4 confirmed the President's appointments of Robert W. Woolley, Clyde B. Aitchison and

George W. Anderson as members of the Interstate Commerce Commission and the appointments became effective at once. Early announcement is, therefore, expected of the reorganization of the commission into divisions to handle the various departments of the commission's work, such as rates, valuation, accounting, etc. Senator Hoke Smith of Georgia, who was absent the day the nominations were acted upon, made an unsuccessful effort on the following day to have the Senate reconsider its confirmation of Mr. Woolley, contending that he had had no experience to qualify him for the position. A photograph of Commissioner Aitchison is reproduced herewith. Biographical sketches of the new commissioners were published last week.

* * *

NEWLANDS COMMITTEE TO HOLD HEARINGS IN SAN FRANCISCO

As predicted last week, the Congressional Joint Committee on Interstate Commerce, of which Senator Newlands of Nevada is chairman, has definitely decided to hold a series of hearings in San Francisco during the Congressional recess, in connection with its general inquiry into matters pertaining to railway regulation. Although Congress passed the provisions on the urgent deficiency bill continuing the committee for another year and providing for a report by December 30, the committee desired to take advantage of the opportunity to hear from the far western people who had signified a desire to testify. As one member of the committee expressed it, it is the purpose on this trip to hear from those who do not enjoy the privilege of free transportation to Washington, which the railroad men have, and it is expected that the witnesses will consist principally of shippers and state commissioners, as most of the testimony heard in Washington last fall and spring was on behalf of the railroads. The plan is to hold hearings for



Clyde B. Aitchison

about three weeks at the Palace Hotel in San Francisco, beginning on November 1. If there is sufficient time available before the opening of the regular session of Congress in December, one or two hearings may be held at other places on the way back.

The committee at a meeting in Washington just before the adjournment of Congress accepted the resignation of William C. Adamson as vice-chairman, effective on December 1. Judge Adamson, who is chairman of the House Committee on Interstate and Foreign Commerce, is to leave Congress to become a member of the board of appraisers of the Port of New York. Thetus W. Sims, who will succeed him as chairman of the House Committee, was elected vice-chairman of the Joint Committee.

TRANSPORTING THE COTTON CROP

The Commission on Car Service has recently been giving especial attention to the problem of transporting the cotton crop in such a way as to handle it expeditiously and without

waste of cars, at a time when the southern cotton producing communities are handling an unusual amount of other business, requiring additional cars, because of the location of so many military camps in the southeast. It is estimated that this year's crop will require the railroads to move 18,000,000 bales, including the duplications incident to reshipment, and that if loaded to the ordinary average of 55 bales to the car this would require over 320,000 cars, while if loaded to an average of 75 bales a saving of 100,000 cars may be effected. Cotton, because of its bulk, rarely reaches the weight capacity of the cars in which it is shipped and therefore any changes which will place a larger number of bales in a car will materially assist in solving the transportation problem. On September 28 a circular was sent by the Railroads' War Board to the presidents of all the cotton-carrying roads calling their attention to a more detailed circular sent by the Commission on Car Service to the chief operating officers emphasizing the opportunity presented for intensive loading, prohibiting the shipment of cotton in quantities of less than 65 bales to the car and requiring as many more to be loaded as the size of the car furnished will permit. In complying with this the Southern Railway has issued a circular to put all concerned on notice that it will require the loading of 75 bales of compressed cotton in all standard 36-foot cars. The circular also includes drawings showing the proper method of loading to stow 75 bales in a car.

A conference of cotton growers, merchants, brokers, warehousemen and compressmen with representatives of the transportation companies was held at Washington on October 5 to consider the problem of transporting cotton from the South to New England, in view of the fact that many of the coastwise boats, which usually carry about half of this traffic, have been withdrawn by the government. Howard Elliott, of the Railroads' War Board, addressed the meeting, explaining the difficulties the railroads are facing in attempting to produce enough transportation to go around and outlining the work of the war board. Mr. Elliott laid stress on the necessity for high density compression, in order to secure heavy loading and expressed the opinion that with the full co-operation of the shippers the railroads would be able to take care of all the most essential transportation, although he said that there is a strong chance that some things cannot be taken care of. The conference adopted resolutions recommending that every effort be made to put the cotton in such a condition as to make possible the maximum loading.

THE RAILROAD PROBLEM

Conditions which are handicapping the roads in their effort to produce a maximum of transportation were explained in Mr. Elliott's address and also in a letter written by Fairfax Harrison, chairman of the Railroads' War Board, in reply to an inquiry by Senator Newlands, which was published in the Congressional Record. Mr. Harrison said in part:

"Data collected by direction of this committee indicates that on April 1 there were approximately 102,000 new freight cars under order for American railroads. Recently, in response to inquiries, it was ascertained that there were approximately 3,015 new locomotives under order. Some progress has been made in completing and delivering these cars and engines to the railroads, but progress has been slow, and will doubtless continue so, while few new orders will be placed by the railroads under the existing pressure for raw materials and the delay in securing steel and other manufactured parts. Thus the capacity of all the plate mills in the United States is 3,850,000 tons. We are advised that the government's program for the coming year will require about 1,600,000 tons of such plates. The needs of the railroads in plates merely for repairs to locomotives and cars during the coming year will be 275,000 tons. Orders for new locomotives, rail, and other railroad equipment for use abroad by the United States and the allies, which have been given preference to the needs of our railroads at home, are also delaying our deliveries. This presents one of our most serious problems in the outlook for the next 12 months."

"Through the efforts of this committee and the active co-operation of the railroads of the country, and, in large measure, of regulating authority, national and state, as well as the shipping interests of the country, much has been accomplished to increase the efficiency of the existing equipment."

"It is impossible to make definite reply to your inquiry as to the adequacy of the present equipment, for the reason that we are without definite information as to the volume of additional transportation which the re-

quirements of the government and our allies may still add to the commercial traffic of the country. We have viewed with much concern the reduction in available coastwise tonnage, which formerly handled large amounts of traffic by water from one part of the country to another. As a result the volume of rail transportation has in certain districts of the country been unusually increased, and if more coastwise ocean tonnage is taken by the government an acute condition may result, particularly in the movement of coal and cotton to New England."

"The continued increase of the efficiency of the railroads depends largely upon the delivery of the cars and locomotives now on order to replace those worn out or destroyed from time to time and the regular receipt of rail and steel products for repair purposes."

"These conditions are vital to the continued upkeep and necessary expansion of the carriers, and without adequate attention to them it is inevitable that the railroad machine of the country will in time halt and in some degree fail to meet the requirements imposed upon it. This committee has from time to time since its formation given expression to its concern on this subject, and, in view of your inquiries, I do not hesitate to direct your attention to the necessities of the railroads in these particulars."

"You further inquire whether the increase in volume of transportation has been sufficient to relieve the apprehension of the railroads that the considerable increase in operating expenses would hamper them in the maintenance and development of the necessary facilities for the service of the public. It is difficult within the reasonable limits of a letter adequately to reply to this inquiry, but public reports of results of operation show that the tendency of heavy and continuing increase in operating expenses on many important lines is exceeding the increase in gross revenues through increased traffic."

"Preliminary returns from 175 railroads, covering the United States as a whole, for June, 1917, show net revenue of \$10,321,241, as compared with \$99,901,700 in June, 1916. For the six months ended June, 1917, net revenues from railway operations were \$528,233,173, as compared with \$550,362,415 for the corresponding period in 1916. For the eastern district net revenues from railway operations for the six months ended June, 1917, were \$197,630,024, as compared with \$230,731,415 for the same period in 1916. In the southern and western districts the six months' figures, as well as those for the month of June, 1917, still show increases in net revenues, but reports of later operations in July and August on some important lines in the west indicate a decline in net revenues."

"This constitutes no present bar to the efficient operations of the railroads, but if the prospects are, as railroad managers believe them to be, that this tendency may increase, then, to the extent that it does, it will increasingly limit the ability of the railroads out of income to maintain and develop their facilities for transportation service. This current tendency to establish expenses on a higher level than ever before is what gives railroad managers their gravest concern at the moment. The present large volume of revenues may not always obtain; when it drops the ability to curtail expenses proportionately is limited by conditions over which the railroad manager has no longer any vestige of economic control. Furthermore, these special conditions, taken in connection with the general conditions affecting the money markets of the country, with which you are familiar, have made it doubly difficult, if not impossible, for even the most favored railroad to raise new capital; the sale of long-term bonds is apparently out of the question excepting at heavier discount than prudence will permit, and the issue of new stock upon any reasonable terms is not within the power of any company. Short-term financing is apparently the only recourse for new capital; under present conditions this method requires the payment of high rates of interest and involves early refinancing, which under the present outlook is an unsatisfactory and, in some respects, a dangerous method of supplying the capital needs of the railroads."

Mr. Elliott showed, among other things, that since the organization of the War Board, something like 141,000 empty cars have been distributed, that the increase in bituminous coal handled in May, June, July and August was 25.2 per cent, while the increase in anthracite handled from January to August 31 was 17.18 per cent, that up to the evening of October 2 the railroads had moved 728,010 of the National Guard, the National Army and the Regular Army, and that passenger train service has been reduced by about 25,000,000 train miles, saving about 1,500,000 tons of coal and releasing about 3,000 men for other work. From May 1 to October 1, he said, 128,000,000 bushels of grain have been sent over to the Allies.

"This movement of putting all the railroads in the country under this so-called War Board is of interest in another way than simply in its aspect of giving a higher efficiency for the use of the people of the United States." He said, "I believe that after the war is over we are going to see the greatest business in the United States that we have ever seen. It may not come the first year, but it is coming."

"Some say that the putting together of the railroads the way we have this year is an argument in favor of government ownership, and that that is what it means. I do not agree with that. I think it means that the splendid initiative of the American business man, that has built up this great transportation system that is today doing 20 to 25 per cent more than it ever did before, even under the complicated conditions that confront all of us—it means that the splendid

initiative of the American business man, if not too much fettered by small and nagging restrictions and allowed to go ahead, can do more for the expansion of American business and the expansion of the country than we could possibly obtain by governmental ownership. I say that because that is one of the great problems that very likely will develop out of this war, and you gentlemen who depend upon a successful transportation system are men who will have to help decide that great question by such views as Congress gets from its constituents all over the United States."

ILLINOIS PASSENGER FARE CASE

The Illinois passenger fare cases, involving the conflict between the Illinois 2-cent fare law and an order of the Interstate Commerce Commission requiring the railways of Illinois to remove the discrimination against St. Louis, Mo., and Keokuk, Ia., and finding that 2.4 cents per mile is a reasonable rate, were argued in the United States Supreme Court on Monday, October 8, by representatives of the roads, the Interstate Commerce Commission and the state. Briefs were filed on behalf of the roads by Silas H. Strawn, Robert B. Scott and A. P. Humburg, on behalf of the Interstate Commerce Commission by Joseph W. Folk, its chief counsel, and on behalf of the state authorities by Attorney General Brundage and his assistants, George T. Buckingham and J. H. Wilkerson. Two cases were heard together, an appeal by the railroads from a decision by Judge Landis of the federal court for the northern district of Illinois, dismissing for want of equity their petition for an injunction to restrain the state authorities from preventing their compliance with the commission's order, and also a cross-appeal by the state authorities. Mr. Strawn, in the opening argument for the carriers, contended that the rate of 2.4 cents a mile, found reasonable by the commission, is not subject to review by the court; that if there is any conflict between the state law and the commission's order the federal authority is paramount; that if the state wished to attack the commission's order its forum was in the federal district court at St. Louis, and that the scope of the commission's order to remove the discrimination is broad enough to require advancing the Illinois fares to 2.4 cents.

Mr. Buckingham, for the state, endeavored to keep the case outside of the doctrine of the Shreveport decision by arguing that the commission's order is too vague and indefinite to serve as a justification for disregarding the Illinois statute. He ridiculed the claim of the carriers that it is necessary to advance fares between all points in Illinois to remove the discrimination found, and contended that while the order did not apply to all points its description of the points to which it applies is indefinite. If the order does apply to all Illinois points, he urged, it was beyond the power of the commission to make for lack of evidence, because the commission had not found that the disparity in state and interstate fares worked any injury to St. Louis.

Mr. Folk supported the railroad contention as to the scope of the order and contended that the commission has the power to compel the removal of a state discrimination against interstate commerce.

LIGHT RAILWAYS FOR WARWICKSHIRE.—In connection with the ironstone development in South Warwickshire, England, an application is being made to the Light Railway Commissioners for an order to form a company to be called the Edgehill District Minerals Light Railway Company for the purpose of constructing a series of light railways connecting the Stratford-on-Avon & Midland Junction Railway with sites in the parishes of Burton Dassett, Radway, which lies at the foot of the Edgehills, Rotley, Upton, Horley, Shinington and Wormington. The new line of railway from the Great Western at Banbury to the Hanwell and district iron ore-fields is being rapidly constructed.

POWER PLANT SUPERVISION ON THE BALTIMORE & OHIO

At this time when railroads are confronted with the problem of operating at maximum efficiency and economy, during an acute shortage of labor, they could not do better than thoroughly to study the operation of their power plants. This is an important field full of possibilities hardly touched by the average railroad. For example, how many railroads know to a drop how much of each kind of lubricant machines in power plants should take, and if they are consuming more or less than that amount? Do they know that proper attention is being paid to the cleaning of boilers, to the repair of tubes, and do they know that the boiler settings are watched and cared for? Do they know what amount of fuel is consumed in each plant and do they know that these amounts are what they should be, and what is most important, perhaps, do they know that the methods of operation and maintenance in all plants are uniform and in accordance with properly determined standards?

There are two general methods of providing for supervision of railroad power plant operation and maintenance, viz.: divisional or departmental. Under the purely divisional system each local terminal organization operates and main-

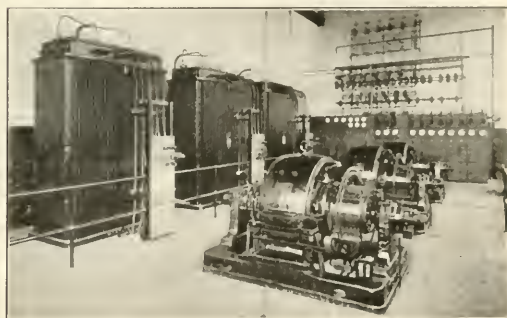


Fig. 1—View of the Switchboard Room in the Curtis Bay Power Plant, Baltimore, Md.

tains its power plant, while under the purely departmental system the operation and maintenance of all power plants over the entire system come under the direct general control of one officer of the company. The inherent fault of the divisional method is that it results in a poor load factor because if the organization is equipped to do the necessary maximum amount of work it is too large when the work is at a minimum. On the other hand, if the supervision is purely departmental, it becomes unwieldy as the organization grows, until finally the supervision of detail becomes impossible. The power plant organization on the Baltimore & Ohio is a combination of the good points of both methods.

Efficient power plant operation requires primarily the co-operation and live interest of every employee, the keeping on hand of a minimum and yet adequate supply of materials and a system of supervision which watches every detail in such a way that the results obtained by each power plant will be comparable with those obtained by all the others. This last requisite is the most difficult to accomplish, but the Baltimore and Ohio has effectively overcome all present existing difficulties by establishing one man control over all power plants on the system. To the man in the field it is usually apparent that a certain piece of work must be done, but it is not always so apparent just how it shall be done to the best advantage of the organization as a whole.

The diagram (Fig. 3.) illustrates part of Baltimore & Ohio

organization which covers power plant supervision. In making a study of this diagram it should be borne in mind that it is the policy of the organization not to make hard and fast rules concerning from whom a man should receive orders or to whom he should give them. It might appear from this that the system is weak, but it will be evident by a careful



Fig. 2—Automatic Stokers and Coal Chutes in Boiler Room, Curtis Bay Power Plant

study of its organization that jurisdiction does not conflict. The railroad is divided into two main parts—Eastern Lines and Western Lines. The Eastern Lines are split into three

black lines in the diagram indicate the order of the pay roll and the order of first hand instructions. The dotted lines indicate the supervision of methods and practices. The electrical engineer also has the power to issue other instructions directly to the five district power plant supervisors and in addition they meet him in council once each month.

REPORTS

With the view of making practice uniform, report blanks and bulletins are issued by the electrical engineer at Baltimore. The standard log sheet made out by the power plant engineer is a report which furnishes information regarding the operation of the boiler and engine room, also a record of fuel and supplies received. The form also gives sufficient information regarding the output of each generator to enable the electrical engineer's office to draw a maximum load curve each month. At the end of the month the report is signed by the power plant engineer, is approved by the master mechanic and sent to the electrical engineer.

From information shown on the power plant time cards and material cards the division accountant prepares a condensed statement, which is sent to the office of the electrical engineer each month with copies to the power plant supervisor and other local supervising officers. In the electrical engineer's office the information is boiled down, reduced to a comparative scale, assembled with the data received from all the power plants in the several districts, and made up in blueprint pamphlet form known as the general power plant statement. This not only contains the cost of operation, fuel consumption, cost of supplies and cost of labor for the month, but also includes the record for the previous month and the average for the year up to date. Copies of the statement are sent to the following: Vice-president in charge of operation and maintenance, general superintendent of motive power, two superintendents of motive power, the electrical engineer, his assistant and his statistician, the five general master mechanics, the five power plant supervisors, all master mechanics, all superintendents of shops and all power plant engineers. By glancing at this statement it is easy to tell if the operation in a certain power plant is improving or

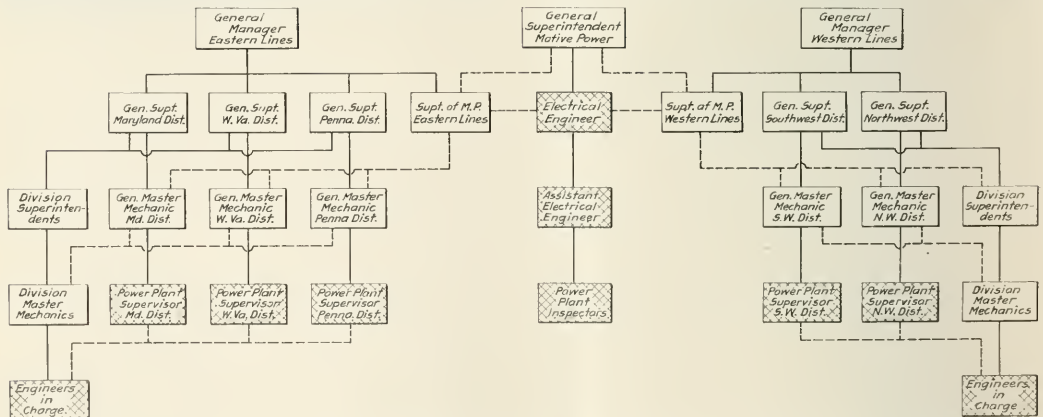


Fig. 3—That Part of the Baltimore & Ohio Organization Having to Do with Supervision and Operation of Power Plants

districts, namely, the Maryland district, the Pennsylvania district and the West Virginia district. The Western Lines are split into two districts, the Southwest district and the Northwest district. A district power plant supervisor attached to the staff of the general master mechanic is placed in each one of the five districts. These men receive instructions regarding the work to be done from the general master mechanic and receive directions regarding how and when it shall be done from the electrical engineer. Thus the full

falling off and to compare it with the operation of any other power plant on the system.

USE OF BULLETINS

With the system developed as outlined above, J. H. Davis, the electrical engineer, was confronted with the problem of obtaining the co-operation of every employee, and of developing a school whereby every employee could and would learn how to bring power house operation up to a maximum effi-

ciency. He conceived the idea of sending out useful information and instructions in the form of short bulletins, couched in language understandable by the average fireman and engineer. It was also considered essential to start at the bottom and have the first bulletins cover information of a fundamental nature. The subject matter of each bulletin is the result of careful study and thorough investigation by specialists.

In a broad way the objects of the series of bulletins are: (a) To bring about a better understanding of the subject of steam generation and its utilization; (b) to point out the causes of losses, preventable and unpreventable; (c) to show how better results may be accomplished and how maximum operating economy may be insured.

Bulletins were also issued to cover repairing, inspecting and testing of stationary boilers, as well as the operation and maintenance of power plants in general. All bulletins are as concise as possible, and the use of technical terms is avoided.

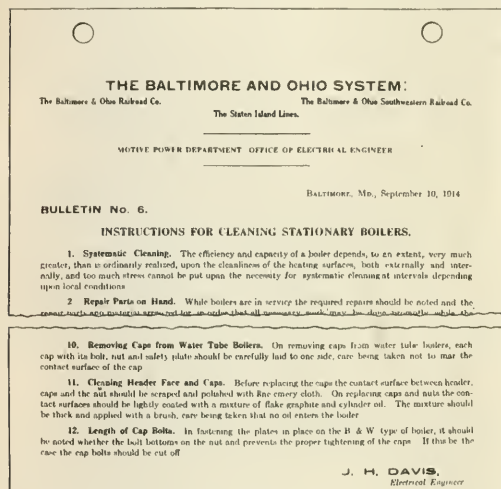


Fig. 4—Sample Copy of Instruction Bulletin Sent Out by the Electrical Engineer

They are of uniform size and are arranged for insertion in loose leaf binders. A copy of one of the bulletins issued is shown in Fig. 4.

Another of the bulletins contains the following information: "As provided in Circular S-2, dated July 13, 1912, the electrical engineer's approval must be obtained before installing steam and air lines or making renewals of existing lines." It is apparent that adding on steam or air lines indiscriminately will eventually overload the power plant and impair all of the previously existing services. Furthermore, the approval of a competent engineer will insure that the work will be done in accordance with the best practices. If it is a case of renewal of an existing line, because of machinery which is to be installed, it may be desirable to change the size of the line or to place it differently. The engineer is the man in the position best to foresee such eventualities.

The following are the titles of the bulletins issued to date:

- No. 1. Generation and Use of Steam from Stationary Boiler Plants.
- No. 2. Rules for the Operation and Care of Stationary Boilers.
- No. 3. Rules for Testing, Inspecting and Cleaning Stationary and Portable Boilers.
- No. 4. Power Plant Losses.
- No. 5. Operating Instructions for Jones Underfeed Stokers.
- No. 6. Instructions for Cleaning Stationary Boilers.
- No. 7. Repairs to Stationary Boilers.
- No. 8. Masonry in Boiler Settings and Furnaces.
- No. 9. Care, Maintenance and Operation of Electric Motors and Controllers.

- No. 10. Hand Firing Soft Coal Under Power Plant Boilers.
- No. 11. Pipe Covering.
- No. S-2. Operation and Maintenance of Lighting and Power Plants.
- No. S-8. Numbering of Stationary and Portable Boilers.
- No. S-9. Rules for Testing, Inspecting and Cleaning Stationary and Portable Boilers.
- No. S-13. Extension and Renewals of Steam and Air Lines.
- No. S-17. Reporting of New Installations, Transfers, Renewals and Scrapping of Power Plant and Electrical Machinery.
- No. 20. Fusible plugs—Stationary Boilers.
- Bulletin No. S-9 annulled and superseded Bulletin No. 3.

A reference book on "Steam—Its Generation and Use" was furnished each power plant. In addition to requiring power plant employees to familiarize themselves with the bulletins they are required to read portions of the reference book from time to time. The bulletins are followed by personal conferences with those engaged in the production and utilization of steam from stationary power plants, the idea being to work out in each plant the best and most economical operating methods. In this way each employee receives, almost in spite of himself, information quite as valuable to him as to his employer. The information is mailed under personal cover to each individual interested and is given out in small doses so that the men pick up and read the bulletins almost as easily as they would a newspaper. Almost without exception they have taken a lively interest in the educational campaign with excellent results. It is of interest to note that, although the photographs in Figs. 1 and 2 were taken without a preparatory cleaning up, the plant presents an exceptionally orderly appearance.

About a year ago, due to conditions caused by the war, some trouble was experienced because of firemen leaving to accept more attractive jobs. This resulted in a temporary shortage of that class of labor. This difficulty has been partially overcome by installing mechanical stokers, but it is apparent that this improvement does not constitute a complete remedy.

WHAT THE SYSTEM HAS ACCOMPLISHED

As an example of the results which can be obtained by proper supervision of power plants, the following incident is cited: The reports from a certain power plant indicated that the consumption of lubricating oil was abnormally large, and in spite of the best efforts of the engineer in charge the consumption continued to be excessive. The district power plant supervisor was sent to the plant and found that the engine was using the minimum amount of oil required to keep the bearings cool. Knowing that something must be wrong, he drilled into the foundation and found the sand in the center saturated with oil. This led to the discovery of a small crack or fissure in the bed plate casting. After the crack was closed by electric welding the oil consumption became normal. It was only through proper supervision, which required accurate reports, that the detection of such a leak was possible.

Although the lubricating oil now being used in all of the 40 power plants is of a better and more expensive grade than that formerly used, estimates indicate that the organization, in one year, has greatly reduced its total expenditures for this item.

It is common knowledge that shop output and engines despatched have increased abnormally during the past year. In addition to this the Baltimore & Ohio has increased the load on a number of its power plants by installing yard taps from the compressed air lines so that trains will already be "pumped up" when the engine takes hold of them. In spite of these increases, the consumption of coal in the power plants was only one per cent more during the fiscal year ending July 1, 1917, than it was the year previous.

Briefly the method of power plant supervision used by the Baltimore & Ohio insures that all operation and maintenance is in accordance with the best practices, that unnecessary work is not done, and, what is of greater importance, it commands the interest and co-operation of each and every employee.

General News Department

The annual convention of the Railway Real Estate Association, which was to have taken place this month at Duluth, Minn., has been postponed for one year on account of the war.

Switchmen on the Elgin, Joliet & Eastern, who struck on September 27, for a 50-per cent increase in wages, returned to work on October 6 and 7 without having their demands granted either in full or in part.

The Supreme Court of the United States has declined to review the decision of the lower court in which the Northern Central was fined for paying rebates to the Mineral Railroad & Mining Company on shipments of coal.

The United States Civil Service Commission announces examinations, November 21, for accounting and statistical clerk, men only, for positions in the Division of Statistics, Interstate Commerce Commission, also the Division of Valuation. Salary, \$1,200 to \$1,620. Applicants must be from 21 to 45 years old.

In the shops of the Grand Trunk at Stratford, Ont., the female employees have been directed to wear uniforms; that is to say, overalls. This is to lessen the danger of accident by catching clothing in machinery. These women for some time have been required to wear caps while at work, some of them having been injured by having their hair caught in drills.

In the urgent deficiency appropriation bill, passed by the Senate on October 3 and by the House on October 4, the appropriation for the transportation of the army and its supplies was fixed at \$375,000,000 by the action of the conferees. In the original House bill the proposed appropriation was \$350,000,000; the Senate increased it to \$413,000,000 and the conferees adopted a compromise.

James Simpson, master mechanic of the Northern Pacific at Livingston, Mont., advises that 39 women are now employed at the roundhouse at Lanrel, Mont., Livingston, Bozeman, Whitehall and Butte, in the capacities of roundhouse foremen's clerks, coach cleaners, wipers, sweepers and turntable operators. The majority of the women so employed are rendering very satisfactory service.

When Joe Willet, a tourist conductor in the employ of the Chicago, Burlington & Quincy, stepped from the train at Boston, Mass., on October 3, he completed his three hundredth round trip between Boston and Los Angeles. He takes a party from Boston across the continent to San Francisco and Los Angeles every 21 days. He estimates he has traveled 4,000,000 miles, a distance equal to 1,600 times around the world.

Up to date 33 employees in the valuation department of the Chicago & North Western have entered army service. Those who had voluntarily entered military service from the North Western engineering department up to August 15 included one assistant engineer, four computers, one construction accountant, one draftsman, 12 instrument men, one assistant pilot, four rodmen, two recorders, three tapemen, and two stenographers.

The Chicago, Rock Island & Pacific, which recently prepared a colored map of the United States showing the location of the various encampments, announces that its first issue of over 100,000 has been exhausted and that it is reprinting the map in order to meet the continued demand for it. The Rock Island also granted permission to the Chicago Tribune to republish the map as a colored supplement in its Sunday issue of September 2, which resulted in a distribution of 650,000 copies.

The proceedings of the conference on social insurance which was held at Washington last December, under the auspices of the International Association of Industrial Accident Boards, have been printed in a thick volume of 935 pages and issued as Bulletin No. 212 of the Bureau of Labor Statistics, Department of Labor. The conference was participated in by a large number of well-informed speakers from the principal departments of industry which are interested in accident and health insurance.

The St. Louis-San Francisco, on October 1, granted increases in wages, ranging from 8 to 10 per cent, to station agents, telegraph operators and other station employees, yard clerks and clerks in the general offices at Springfield, Mo., as well as clerks in the division offices, who had not been granted an increase since January 1. The 10 per cent increase was granted to those employees who received only a 4 per cent increase in August, 1916, while the 8 per cent increase goes to those who received a 6 per cent advance at that time.

The Pennsylvania Railroad (all lines east of Pittsburgh and Erie) reports that the average freight carload in July of this year was 33.51 tons, as compared with 29.57 tons in July, 1916, an improvement of more than 13 per cent. This was equal to a saving of 81,268 cars in the number required to handle the traffic of the road during July. This saving not only enabled the road to handle a much larger amount of commercial business, but also aided materially in rendering efficient military transportation, especially in the carrying of materials for the construction of the various cantonnments. It is believed that the results for August and September will show an even greater improvement in car loading.

A Board of Conciliation, which has inquired into a dispute between the Canadian Pacific and its station agents, telegraphers and linemen, recommends that the pay of these classes be increased not less than 18 per cent, and that the pay of train dispatchers be increased not less than 12 per cent. It is recommended that the road discontinue the payment of higher wages to men in western Canada because of the higher cost of living in that part of the Dominion, living conditions in the east and west being now more nearly equal. The employees had asked for an increase of 25 per cent, citing statistics compiled by the Department of Labor showing that, since 1913, the cost of living had advanced more than 30 per cent.

A strike of clerks of the Nashville, Chattanooga & St. Louis, which had made considerable disturbance for over a week, was settled at Nashville on October 8 by an agreement to have the differences discussed later. The company agreed, in putting the men back at their work, to pay them for the time that they had lost. Both employer and employees declared that they agreed to this settlement because of a feeling of patriotic duty. The Canadian Pacific and its complaining telegraphers have agreed to accept the award of the government Conciliation Board in the matter of the operators' recent request for increase in pay. Agents and operators receive 18 per cent increase and dispatchers 12 per cent.

A plan proposed by a committee of the Association of American Railway Accounting Officers for a modification of some of the accounting and statistical requirements of the Interstate Commerce Commission and state commissions, for the purpose of saving clerical man-power during the war, was discussed at a conference held in Washington on October 4 of members of the committee and of the federal commission and the National Association of Railway Commissioners. The representatives of the Interstate Commerce Commission, M. O. Lorenz, statistician, and F. W. Sweney, chief examiner of accounts, were inclined to assent to most of the proposed changes with some modifications, but the representatives of the state commissions could not commit themselves to an assent to the proposals. An outline of the plan was published in last week's issue in connection with the report of the accounting officers' convention.

Pennsylvania Takes \$5,000,000 in Liberty Bonds

At a meeting of the Board of Directors of the Pennsylvania Railroad Company in Philadelphia, Wednesday, it was decided to subscribe, on behalf of the company, for \$5,000,000 worth of Second Liberty Loan Bonds. Other large subscriptions by various railroads are given on a previous page.

Headlight Complaint Dismissed

Arguments were heard before Judge Anderson of the United States District Court for the district of Indiana at Indianapolis on October 9 on a motion of the United States government to dismiss a complaint filed by the New York Central about three months ago to restrain the government and the Interstate Commerce Commission from enforcing the commission's order requiring the use of high power locomotive headlights. The court granted the motion to dismiss the complaint.

Germany Plotted Destruction of Railroad

Despatches indicating that the German general staff had planned the destruction of the Canadian Pacific Railway line at important points have come into the possession of the State Department. Secretary of State Lansing on Wednesday gave out a copy of a secret message dated January 3, 1916, from Zimmerman, who was then in charge of the German foreign office, to Count von Bernstorff, the German ambassador to this country, including the following instructions: "General staff desires energetic action in regard to proposed destruction of Canadian Pacific Railway at several points with a view to complete a protracted interruption of traffic." Count von Bernstorff was also instructed to provide the necessary funds.

National Railway Appliances Convention to Be Held

The officers of the National Railway Appliances Association have issued an announcement that it is the intention of that association to hold its tenth annual exhibition at the Coliseum and Annex, Chicago, March 18 to March 21, 1918.

The annual exhibition of the National Railway Appliances Association has been held each year in Chicago at the same time as the March meetings of the American Railway Engineering Association, the Railway Signal Association and the Association of Railway Telegraph Superintendents.

With the announcement that the meeting is to be held are sent application blanks for space. Applications for space must be filed in the office of the secretary-treasurer, 122 Michigan avenue, Chicago, not later than November 1.

Railway Returns for August

The Interstate Commerce Commission has made public its partial summary of railway returns for August, giving figures for 153 roads operating 192,397 miles. While operating revenues increased from \$1,357 per mile in August, 1916, to \$1,518 in August, 1917, the operating expenses per mile show an increase from \$855 to \$1,026 so that the net revenue was reduced from \$502 to \$492. While the southern roads show a slight increase in net the eastern and western roads show a reduction. For the eight months total revenues per mile were \$10,839, as compared with \$9,673; expenses, \$7,677, as compared with \$6,493, and net operating revenues were \$3,162, as compared with \$3,180 in 1916. The eastern roads are considerably behind the average for last year in net while the southern and western roads both show increases.

Conductor Sharp

Conductor E. S. Sharp, of the Yazoo & Mississippi Valley, showed tactfulness and high efficiency in the handling of a recent case. A woman and four children boarded his train at Tehula by mistake, both the conductor and the flagman being, just then, engaged in other duties. When Mr. Sharp found the lady and children on his train, he saw that there was nothing to do but carry them on to Greenwood (24 miles), where they could be made comfortable (for six hours), and send them back to Tehula on train No. 313. This he did and the lady seemed perfectly satisfied. She even went so far as to say that she did not blame anybody for the mistake but herself; and while she was in that humor, Mr. Sharp thought it would be a very good time to pay her a small amount and take her full release of the company, which he did. The release was sent in to the claim department and Mr. Sharp was promptly reimbursed. If no settlement had been made by the conductor, the lady might have changed her mind about who was at fault and brought suit against the com-

pany and caused the entire train crew to waste a lot of time hanging around the court house waiting to be called as witnesses. Conductor Sharp is to be commended.—*Illinois Central Magazine.*

Progress of the Mobilization

Up to Tuesday of this week, the railroads had moved 824,000 soldiers to the various training camps and cantonments or embarkation points. This includes the third increment of the National Army, approximately 25 per cent, or 172,000 men, who were entrained at local concentration points from October 3 to 7 and this leaves about 30 per cent still to move. The balance of the National Army are to be moved beginning on October 17 and there are still some National Guard units to be moved.

Approximately 2,500 carloads of food and other necessities are being delivered daily by the railroads at the cantonments where the new National Army and the National Guard are being trained for service abroad, according to reports just received by the Railroads' War Board. The task of the railroads is to supply all the necessities of life for 10 non-productive cities of a population of 40,000 each and 56 smaller cities ranging in population from 300 to 3,000. Altogether, more than a million men must have their daily necessities brought to them by the railroads.

U. S. Employment Exchange for Engineers

The employment service of the United States Department of Labor recently created a branch known as the Teachers and Professional Service Division, the function of which is to aid the employer in obtaining suitable help, and professional persons in securing suitable employment. While intended to embrace all professions, attention has thus far been confined to the teaching and engineering professions. Employers, in reporting positions, are asked to state the nature of the position, its duties, requirements, etc., the possible salary and the probable duration of employment. Applicants for registration should indicate in the first letter the nature of the position desired so that the proper blanks may be furnished.

No service is rendered an applicant until the division has learned from persons familiar with him that he is qualified as to training, experience and personal qualities for the position he seeks. When an applicant is recommended for a reported vacancy, the employer is given an opportunity to examine the data gathered in the course of the investigation, thus effectually preparing for the final step, the personal interview, for which ample facilities are provided in the offices of the division. The services of the division are entirely free, the expense being borne by the government. All communications should be addressed: Teachers and Professional Service Division, U. S. Employment Service, 845 South Wabash avenue, Chicago, Ill.

Navigation on the Ohio With Artificial Floods

Coal to the amount of over 150,000 tons has been taken in boats down the Ohio River, from the mines on the Kanawha River, to Cincinnati and vicinity during the past two months by the aid of artificial rises in the river produced by drawing water from the pools formed by the dams above Huntington, W. Va. To create these artificial rises water was released from pools starting at Dam No. 7 near Midland, Pa., thirty-seven miles below Pittsburgh to Dam No. 29 below Catlettsburg, W. Va., and from the Big Sandy and Kanawha Rivers.

This water transportation, introduced to relieve congestion at mines due to shortage of railroad cars, has been arranged by Colonel Lansing H. Beach, Corps of Engineers, U.S.A., Division Engineer, Central Division, Cincinnati, Ohio. From August to December is a period of low water in the stretches of the Ohio River where it has not been brought to the nine-foot stage by means of dams; twenty-one dams have been completed and are in operation between Pittsburgh and Cincinnati and fourteen remain to be completed on this stretch of the river, leaving nearly 150 miles of river difficult to navigate during the low water period.

Previous to September some relief was afforded by releasing one or two pools to permit navigation of boats over shallow reaches of the river. Some systematic scheme, however, was necessary to obtain the maximum use of the artificial rises without interference with ferry and packet boats; and it was necessary to regulate the drawing of water from the upper pools so as to

prevent them from being drained to the extent that they would be put out of commission. A meeting was held by the Army Engineers with representatives of the various river interests, and plans were devised by which artificial rises would be given from the pools at regular stated intervals. These artificial rises were started in August and several have occurred since. One last week brought down four tows with over 40,000 tons of Kanawha River coal. It has been arranged to give three rises a month about the first, tenth, and twentieth, until the fall rains bring on the natural rises during November or December.

The New Jersey Full-Crew Law

The Public Utility Commissioners of New Jersey have been holding hearings for nearly three weeks on the petition of the Central Railroad of New Jersey to reduce the number of trainmen on certain freight trains in accordance with the Act of March 22, 1917, empowering the board, after hearing, to regulate the number of employees on any train. These hearings have now been completed and briefs are being prepared by the railroad company and the Brotherhood of Railway Trainmen for argument October 24, after which it is expected that the petitions of the other railroads in New Jersey will be taken up. The petition of the Central relates principally to trains of comparatively light tonnage, making but few stops and having little or no switching work to perform. The Brotherhood of Railway Trainmen, acting for the employees, has consumed most of the time allotted to these hearings in the submission of reports and the testimony of witnesses tending to show that the trains referred to in the petitions of the railroad company are affected by many causes which render the services of the extra brakeman necessary, such as hot boxes, broken brake beams, draw heads pulled out, broken knuckles, inspection of trains, testing air brakes, etc. A mass of evidence was submitted by the trainmen relating to the amount of work performed by the train crew which has very little, if any, bearing on the question of safe operation or adequate service for the protection of the public or the employee. It now seems likely that the physical characteristics of each railroad, together with their operating rules and practices, their signals and switches will be taken into consideration by the board.

Prior to the passage of the full crew law, in 1913, it was understood that the New Jersey Public Utility Commissioners had power to pass upon the question of adequate service and, in fact, had, in some instances, issued orders relative to the manning of trains. It had also thoroughly investigated the subject of manning trains and made a report to the Senate, so that upon completion of the present hearings it will be in possession of specific data to enable it to approve or disapprove the manning of trains as suggested by the railroad companies.

Coal Situation

Denial of reports of a coal shortage in Washington, D. C., or of a general shortage in Eastern points, either present or prospective, was made on October 5 by Fuel Administrator Harry A. Garfield. There is not now enough coal in Washington for the winter, he said, but the quantity needed will be supplied after navigation closes on the Great Lakes on November 15. "Shipments to the Great Lakes are being given preference in order to provide sufficient coal for the Northwest before the close of navigation," according to the statement. "This is necessary in order to prevent shipment of coal all rail to the Northwest after the close of navigation, thus sending cars out of service, which would result in an actual car shortage. The Eastern sections of the country are being supplied with sufficient coal for necessary requirements, but increased shipments are not being made for storage purposes because all surplus coal is being shipped to the lakes for Northwest delivery from the docks. As soon as navigation closes on the lakes such shipments will be diverted to Eastern points and distributed according to need; and we anticipate there will be sufficient coal available for necessary requirements.

"The matter of prompt movement of coal cars is now receiving consideration and it will undoubtedly be necessary to give them preference in movement, both loaded and empty, over other slow freight. This will provide additional cars, which should result in increased production sufficient for all necessary purposes."

One of the most important problems now being considered by the Fuel Administration is that of insuring an adequate supply of

fuel coal for the railroads. Many roads have not been able to contract for their full supply and have had to meet their requirements by furnishing cars on certain days only for railroad coal. This subject has been taken up by E. E. Clark of the Interstate Commerce Commission, Fuel Administrator Garfield and R. S. Lovett, priority commissioner, and also has been the subject of conferences between representatives of the Division of Car Service of the Interstate Commerce Commission, the Commission on Car Service and the coal interests. An order from Mr. Garfield prescribing a method of apportioning coal to railroads is expected this week.

The Fuel Administrator on October 7 issued some new regulations, in one of which it is held that coal confiscated by railroads for their own use may be purchased from the owner at the price under which it was consigned when confiscated, if this is not above the figure set by the President. Exception must be made when it has been consigned under a contract that would stand in court, made before the presidential order, in which case the railroad must pay the higher figure if it wants the coal. Another regulation directs that the product of "wagon mines" be shipped in box cars, when it is sent to the general market by rail, thus saving the open cars for the use of mines where the loading can be done most quickly. Where box cars are used by wagon mines a charge of 75 cents per ton, in addition to the President's prices, is permitted to cover the cost of hauling and loading.

Coal miners and operators of western Pennsylvania, Ohio, Indiana and Illinois have appealed to Mr. Garfield to increase coal prices at the mine, fixed in President Wilson's orders, to permit the wage advances agreed upon on October 6 in a conference that began at Washington on September 25.

The weekly report of the Geological Survey on coal production shows that 192,720 carloads of bituminous coal were hauled from the mines by 144 coal-carrying roads during the week ending September 29, the best week since July 28, but the percentage of production to mine capacity was reduced. "Troop movements, congested traffic and disturbances in the labor force at the mines appear to be responsible for the sudden drop in coal production during the week which ended September 22," says the statement. "For all mines reporting the causes of lost time, due to car shortage, increased from 9.8 to 10.5 per cent of the full time capacity, the most acute shortage for many weeks. In the same time losses due to labor shortage increased also."

Meeting of Telegraph Superintendents

A special meeting of the Association of Railway Telegraph Superintendents will be held at the La Salle Hotel, Chicago, on November 22. At this meeting it is proposed to consider the following subjects:

1. Brief progress reports from the different special committees. Committees will meet at the hotel on November 21.
2. Conservation of telegraphing and telephoning in connection with both commercial and railroad wires. A special committee is expected to report on this subject.
3. Shortage of operators and plans for schools to teach operators. A special committee will report.
4. Emergency use of wire facilities in the operation of railroads to meet the present war situation.

Car Foremen's Association of Chicago

At the annual meeting of the Car Foremen's Association of Chicago, which was held at the Hotel Morrison, Chicago, on October 8, the following officers were elected: President, H. H. Estrup, general foreman, Chicago & Eastern Illinois; first vice-president, E. G. Chenoweth, mechanical engineer, Rock Island Lines; second vice-president, M. F. Covert, assistant master car builder, Swift & Co.; treasurer, F. C. Schultz, chief interchange inspector, Chicago Car Interchange Bureau; secretary, Aaron Kline.

Western Railway Club

The next meeting of the Western Railway Club will be held at Hotel Sherman, Chicago, on October 15. Samuel O. Dunn, editor of the *Railway Age Gazette*, will make the opening address, and H. T. Bentley, superintendent of motive power and machinery of the Chicago & North Western, will read a paper on Locomotive Terminal Delays.

Better Business Correspondence Convention

The belief that much business correspondence is not all that it ought to be has led to the calling of a convention to discuss the subject of better business correspondence at Worcester, Mass., October 15 and 16. The meeting will be held in the assembly hall of the Norton company at Worcester, and at the meeting recognized experts in business correspondence for a number of large companies will exchange ideas on the subject through written papers and informal discussion.

The two important subjects to be brought up deal, respectively, with the writing of the letter and its transcribing, it being believed that too many letters are ineffective and that the methods of dictating and transcribing are wasteful.

It is hoped to make this meeting the first of a number of such meetings, so an organization will be perfected and permanent officers elected.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of meet or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Next meeting, October 16-17, St. Louis.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichy, C. & N. W., Chicago. Next convention, October 16-18, 1917, Chicago.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—Tom Lehon, The Lehon Company, Chicago. Meetings with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 844 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Morrison Hotel, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November.

ANNUAL MEETING, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CINCINNATI RAILWAY CLUB.—H. Bortet, Chief Interchange Inspector, Cin'tn Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Eloer K. Hiles, 568 Union Arcade Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

MAINTENANCE OF WAY AND MASTERS PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—F. J. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 16-18, 1917, Cleveland, Ohio.

NATIONAL ASSOCIATION OF RAILWAY COMMISSIONERS.—Jas. B. Walker, 120 Broadway, New York City. Next annual convention, October 16, 1917, Washington, D. C.

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

NEW YORK RAILROAD CLUB.—Herry D. Vought, 95 Liberty St., New York. Regular meetings, 1st Friday in month, except June, July and August, 26 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Gen. A. J. Hochgrebe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, Buffalo, N. Y.

PACIFIC RAILWAY CLUB.—W. S. Wellner, Assistant to Chief Engineer, Northwestern Pacific R. R., San Francisco, Cal.

PROBIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial Annex Hotel, Pittsburgh.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

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

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—J. W. Cox, N. & W., Philadelphia, Pa. Next annual convention, October 16-18, St. Louis, Mo.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.

TRAFFIC CLUB OF B. & O.—B. B. Fisher, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, 1st Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

WESTERN CANADIAN RAILWAY CLUB.—J. K. Jamieson, Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

WESTERN SOCIETY OF ENGINEERS.—Edgar S. Nethercut, Acting Secretary, 1735 Mondanock Block, Chicago, Ill. Regular meeting, first Monday in month, except January, July and August. Extra meetings generally on other Monday evenings except in July and August.

Traffic News

At Winnipeg, October 4, it was announced that both the Canadian Pacific and the Canadian Northern had placed an embargo on all shipments of grain to Fort William and Port Arthur.

Embargoes imposed by the Great Lakes Transit corporation have made it necessary to prohibit the acceptance of freight by boat on the Erie Canal between Albany and Buffalo.

Paul M. Ripley, who resigned as assistant to president of the El Paso & Southwestern in June, has been appointed traffic manager of the American Sugar Refining Company, with headquarters at New York.

To avoid disastrous depletion of herds of cattle and sheep in Western Canada, the government is arranging with railroads of the dominion to carry breeding animals westward at reduced rates, or, in some cases, free, the government bearing a part of the burden.

The Senate on October 5 passed a bill, which had previously passed the House, giving the United States Shipping Board power to suspend present provisions of law for the purpose of permitting vessels of foreign registry and foreign built vessels admitted to American registry to engage in the coastwise trade during the war and for a period of 120 days thereafter, except the coastwise trade with Alaska.

Columbia University, New York City, now maintains an "extension school" at 203 Broadway, in the heart of the business district, where courses are given in railway traffic and rates by Professor T. W. Van Metre and on ports and terminal facilities by R. S. MacElwae. These classes are held between 5 p. m. and 7 p. m. and the fee is \$18 each. There is also a course on theory and practice of ocean transportation, at the same price; also other courses on commercial topics.

The Canadian Pacific has presented at Washington a strong protest against the embargo which was placed by the United States Government on shipments of coal to Canada, declaring that at the present rate the railroad will be in danger of a short supply of coal for its locomotives; locomotives which are engaged in moving American military supplies both to Atlantic and Pacific ports. It is said that these supplies are being sent both to Halifax and to Vancouver, because of the congestion at ports in this country.

A further saving of 96,772 tons of coal per annum, 30 locomotives and 114 men has been effected by reductions in passenger train service on the railroads traversing the 15 central states designated by the Secretary of War as the "Central Department." The total saving of man power, fuel and locomotive power on these railroads in the 15 states from Ohio to Colorado, by passenger train service reductions, is 1,086,171 tons of coal per annum, 203,067 barrels of fuel oil, 350 locomotives and 1,774 men.

The United States Department of Agriculture has issued a circular to farmers, showing what they can do to help in the movement of freight. They are reminded that the transportation situation is still serious, and that cooler weather makes refrigeration less necessary, and makes it possible to run more commodities under ventilation and to load cars more heavily than during the summer. Patriotism demands of farmers and everybody the heaviest loading possible consistent with the safe carriage of the goods.

PASSING OF THE ALLAN LINE.—It is announced that if July 1 the Allan Steamship line loses its separate identity and is merged in the Canadian Pacific Ocean Services. Dating from the heroic days of early steam navigation the Allan line has been a vigorous pioneer in the development of the Trans-Atlantic trade, and especially in the development of Canadian trade with the mother country. —American Express Bulletin.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The Interstate Commerce Commission has announced that hearings in the eastern commodity rate case will begin at Washington on November 1 before Examiner Disque.

The Commission has announced hearings at Chicago before Examiner Disque to be held on November 16 in the eastern livestock-fresh meat case, and on November 21 in the eastern grain case.

The Commission has suspended from October 11 to February 8 the operation of certain rates in Agent M. P. Washburn's tariff providing for the cancellation of joint through carload rates on grain and grain products from East St. Louis, Ill., via the Baltimore & Ohio and Louisville, Ky., to Tampa and other points in Florida.

The commission has suspended until February 7, Chicago & North Western, Chicago, Milwaukee & St. Paul, Great Northern, Minneapolis & St. Louis, Minneapolis, St. Paul & Sault Ste. Marie and E. B. Boyd's tariffs, naming increased carload rates on potatoes from Wisconsin, Minnesota, Upper Michigan, North Dakota, South Dakota and Iowa, to interstate destinations. The proposed rates are from 1 to 13 cents per 100 lb. higher than those now in effect.

The Commission has made public the tentative report of Examiner Disque in the livestock classification case, in which it is held that proposed ratings on livestock, less than carload, in Official Classification and Southern territories have not been justified. The roads, however, are authorized to establish new minimum weights and ratings. In view of the amended Cummins amendment carriers in Official Classification territory are required to cancel schedules which provide rates on ordinary livestock dependent upon value.

STATE COMMISSIONS

The Illinois Public Utilities Commission has this week authorized a general increase of 15 cents a ton in freight rates on coal and coke.

The Public Utilities Commission of Colorado, in a decision issued September 23, has authorized the Denver & Salt Lake to increase its local passenger fares from 4½ cents a mile to 5 cents; round trip fares to be at a rate ten per cent less than this. The road is in the hands of receivers and has had very poor traffic for several years; but the commission requires that mileage books at \$30 for one thousand miles, good for the holder and any member of his immediate family, shall be continued in use.

The construction of telegraph and other wire lines across railroad lines, or over or under the facilities of any public service company, is the subject of a pamphlet of 172 pages which has been issued by the Public Service Commission of Pennsylvania. Seven sets of specifications are given, for different classes of work; and in appendices filling about 100 pages—nearly two-thirds of the book—there are a number of chapters containing all sorts of detail information, including drawings, diagrams and tables. The pamphlet is called General Order No. 13, and it says that crossings conforming to the requirements may be constructed without any special permit from the commission, provided notice is seasonably given to the company whose facilities are to be crossed.

PERSONNEL OF COMMISSIONS

Lester Sisler, until recently chief clerk of the Interstate Commerce Commission, has been appointed secretary of the United States Shipping Board. He was recently appointed assistant secretary.

COURT NEWS

Delivery of Goods

The New Mexico Supreme Court holds, in an action for conversion by a consignee, that a railroad company is not estopped to deny delivery by reason of the fact that its agent mailed to the shipper a postal card, on a printed form supplied by the shipper, stating that the goods had been delivered, where subsequent communications between the shipper and the consignee showed there had been no delivery.—*Levers v. Atchison, T. & S. F.* (N. M.) 166 Pac. 1178. Decided July 30, 1917.

State Commission's Power to Refuse Permission to Issue Bonds

The Missouri Supreme Court holds that an order of the Missouri Public Service Commission refusing permission to the Union Pacific, a Utah corporation owning 3,500 miles of road and \$300,000,000 worth of property, only \$3,000,000 of which is in Missouri, and only 1,000 feet of track, to issue bonds for rolling stock and other betterments, would not be "reasonable and lawful," as required by Section III of the Missouri Public Service Act.—*P. S. C. v. U. P.* (Mo.) 197 S. W. 39. Decided June 30, 1917.

Recovery of Freight Charges Overpaid by One Road to Another

Action was brought by the Mobile & Ohio against the Washington & Choctaw to recover money paid by the plaintiff to the defendant on a claim by the latter that it was entitled to a division of the freight on certain lumber shipments. The two railroads had a joint tariff providing a through rate for shipments of lumber originating on the defendant's line, but providing no through rate permitting such shipments to be stopped at the junction point, and there dressed and then forwarded. On lumber so stopped the defendant collected from the original shipper the local rate to the junction point, but demanded and received from the plaintiff a portion of the freight from the junction point to destination, the rate in force on such shipments being the same from the junction point as from the point of origin on the defendant's line. The Federal district court for the Southern District of Alabama holds that the plaintiff was entitled to sue for the payments so made, though they were voluntary, and though in making and receiving them both railroads were guilty of unlawful acts, as the plaintiff was damaged by such payments, and the statute is not limited to the regulation of contracts between shipper and carrier.—*Mobile & Ohio v. Washington & Choctaw*, 242 Fed., 531. Decided May 19, 1917.

Carrier's Liability as Warehouseman

A railroad company, as the last connecting carrier, received a carload of copper ingots, shipped under a bill of lading providing that "property not removed by the party entitled to receive it within 48 hours . . . after notice of its arrival . . . may be kept in car . . . or warehouse subject to a reasonable charge for storage and to carrier's responsibility as warehouseman only." The company's tariff, duly filed and posted, provided that, "when delivery of cars consigned or ordered to private industrial spur tracks cannot be made on account of the act, neglect, or inability of the consignee to receive them, delivery will be considered to have been made when the cars are tendered." On arrival of the car the private track of the consignee was fully occupied, and the railroad left the car on its connecting side track, and notified the consignee that the car was at its disposition, subject to the payment of a demurrage charge. Six days later the consignee paid the demurrage charge and the car was moved to its track, when it was found that one of the seals was broken and that a part of the copper was gone, although, when inspected by the railroad's yard watchman, the evening before, the seals were secure. In an action for the value of the copper lost, the Circuit Court of Appeals, Eighth Circuit, holds that the railroad's liability was that of warehouseman only, and under the rule of the federal courts a warehouseman is liable only for negligence, the burden of proving which rests on the party alleging it, and is not shifted by proof merely of loss or destruction of the property in the charge of the warehouseman. Judgment for the railroad was affirmed.—*United Metals Selling Co. v. Pryor*, 243 Fed. 92. Decided July 9, 1917.

Equipment and Supplies

LOCOMOTIVES

THE RED RIVER & GULF is inquiring for 2 locomotives.

THE CHILEAN GOVERNMENT is inquiring for a number of Mikado locomotives.

THE BRITISH GOVERNMENT is reported as inquiring for 70 ten-wheel locomotives for the Egyptian State Railways.

THE UNION MINIERE DU HAUT KATANGA has ordered 4 six-wheel tank locomotives from the American Locomotive Company. These locomotives will have 10 by 16 in. cylinders and a total weight in working order of 48,000 lb.

CENTRAL OF GEORGIA.—Vice-president L. W. Baldwin on September 27 announced that this company is preparing an order for rolling stock to cost approximately \$2,500,000, viz.: 13 locomotives (10 Mallet type and 3 passenger), \$100,000 each, \$1,300,000; 14 passenger cars (12 day coaches, 2 parlor cars), \$20,000 each, \$280,000; 700 freight cars (200 stock and 500 ventilation), \$1,200 each, \$840,000.

FREIGHT CARS

THE WESTERN PACIFIC is inquiring for prices on 1,500 freight cars.

THE NEW JERSEY LINE COMPANY is reported as inquiring for 50 gondola cars.

THE BANGOR & AROOSTOOK has given the Laconia Car Company an order for 150 box cars.

THE PETROLEUM REFINING COMPANY, Houston, Tex., is inquiring for 50 8,000-gal. capacity tank cars.

THE RUSSIAN GOVERNMENT is receiving quotations on a new inquiry for 10,000 four wheel freight cars.

THE INDIANOMA REFINING COMPANY, St. Louis, Mo., is inquiring for 75 to 100 8,000-gal. capacity tank cars.

THE EGIN, JULIET & EASTERN reported in last week's issue as building a number of freight cars in its own shops, will build 500 gondola cars.

THE UNITED STATES GOVERNMENT is reported as having placed additional orders for 4,800 narrow-gage cars for the use of the forces overseas as follows: American Car & Foundry Company, 1,800; Pressed Steel Car Company, 1,000; Standard Steel Car Company, 1,000, and Ralston Steel Car Company, 1,000.

PASSENGER CARS

THE ILLINOIS CENTRAL has ordered 25 coaches, 15 baggage cars and 5 combination passenger and baggage cars from the Pullman Company.

SIGNALING

THE ATLANTA & WEST POINT has ordered from the A. G. A. Railway Light & Signal Company, Elizabeth, N. J., 91 flashlight equipments for its automatic block signals. These lights will be installed by the railroad. An order has also been given by the Missouri Pacific for four signal lighting equipments of a similar type, to be installed at Osage City, Mo. Orders for A. G. A. crossing signals have been received from the following roads: Atlanta & West Point, one flashlight signal of the double-arm type; Philadelphia & Reading, two of the single-arm type, which have been installed on the Atlantic City division at Richland, N. J.; Union Traction Company of Indiana, one for installation at Indianapolis. The A. G. A. company has also received an order for one coach lighting equipment from the Chesapeake Beach Railway.

Supply Trade News

The International Oxygen Company, 115 Broadway, New York, announces the resignation of P. J. Kroll as the company's representative for Pittsburgh and middle western territory.

The MacLeod Company, Cincinnati, manufacturers of sand blast equipment and metallurgical furnaces, in order to take care of its expanding business, will enlarge its plant and increase its capital to \$100,000.

Fayette H. Reed has been appointed special agent of the New Manufacturing Company, New York, covering the states of California, Nevada, Oregon, Washington, Arizona, New Mexico and Utah, with office at San Francisco, Cal.

William S. Bostwick and Chester A. Lyon, formerly with the Magnus Company, Inc., Chicago, announce the formation of the Bostwick-Lyon Bronze Company, of Waynesboro, Pa., and that they have taken over the entire plant of the Waynesboro Foundry & Machine Company, and have fully equipped it as a modern foundry for the manufacture of brass castings, journal bearings and babbit metal.

The A. G. A. Railway Light & Signal Company, Elizabeth, N. J., has received an order from the Atlanta & West Point for 91 flash light equipments for automatic block signals. The equipment will be installed by the railroad. An order has also been received from the Missouri & Pacific for four signal lighting equipments of a similar type, to be installed at Osage City, Mo. Orders for crossing signals have been received from the following roads: Atlanta & West Point, one grade crossing flash light signal of the double arm type; Philadelphia & Reading, 2 grade crossing signals of the single arm type, which have been installed on the Atlantic City division at Richland, N. J.; Union Traction Company of Indiana, one flashing highway danger signal for installation at Indianapolis. The company has also received from the Chesapeake Beach Railway an order for one coach lighting equipment.

Burwell S. Cutler Made Chief of Foreign Commerce Bureau

The appointment of Burwell S. Cutler, of Buffalo, as Chief of the Bureau of Foreign and Domestic Commerce, Department of Commerce, was confirmed by the Senate October 5. Mr. Cutler, who is well known in manufacturing circles in western New York, came into the Bureau six months ago at a nominal salary to assist in putting the organization on a thoroughly business basis. He was made first assistant chief, but since the resignation of Dr. E. E. Pratt, has been acting chief.

Mr. Cutler was born in Buffalo and finished his scholastic education at Lake Forest University and Harvard. For fifteen years he has been president of an important Buffalo manufacturing concern and has been identified in an official capacity with numerous business houses and civic organizations through the New York State.

Westinghouse Air Brake Company

The recently issued annual report of the Westinghouse Air Brake Company for the fiscal year ending July 31, 1917 shows a net profit for the year, after the usual charges and after setting up adequate reserves to cover estimated tax requirements and other contingent liabilities, of \$6,388,463 as compared with \$9,376,103 in 1916 and \$1,575,839 in 1915. While the volume of brake business this year exceeded that of the previous year by 20 per cent, the net income from this source suffered a slight reduction. On the other hand, income from investments this year exceed \$900,000, as compared with \$500,000 last year, and a substantial contribution to the final result came through the munition business now definitely concluded.

President H. H. Westinghouse in his statement to the stockholders says in part:

"The business of your company for the past year under review closely reflects the general condition of affairs, with which you are familiar. While the volume of business has been large, the difficulty of securing adequate labor and sufficient material

has been and remains acute; prices paid for supplies of all kinds have advanced so far beyond previous quotations that experience in forecasting the future has been of little avail; and taxation is unprecedented.

"Prior to April 1, 1917, it was a matter of some pride that during the preceding twenty-five or thirty years the Westinghouse Air Brake Company, by reason of large purchases of raw material when the markets were favorable, and through the continuous improvement of its manufacturing methods, had never been compelled to advance the price of its product to its contract holders. In the face of the conditions that confronted us early in 1917, however, it was found impossible to continue this policy, and all prices have, therefore, been revised so as to afford adequate protection.

"Before the close of the year 1916 the supplementary munition contracts for time fuses referred to in our last annual report were satisfactorily completed. The temporary loading plant at Runyon, N. J., has been sold, and, after consultation with government officials who advised that its facilities would not be required, the fuse loading plant at Providence, R. I., occupied jointly with the American Locomotive Company, has been partly dismantled. This action does not imply any unwillingness on the part of the Brake Company to put its manufacturing facilities and the experience acquired in the production of munitions of war at the service of our own government on any terms the government may nominate. During the interim between our undertaking the manufacture of 3 in. shrapnel complete and the present time, there has been an enormous increase in facilities for doing this class of work by companies normally engaged in the manufacture of munitions. At the same time, the demand for brake apparatus to equip cars and locomotives urgently needed for the transportation of troops and supplies, both here and abroad, has continued to increase in volume and pressure until all of our facilities and every possible effort on our part are required to meet it, and in this striving to prevent serious delay in the immediate increase of transportation facilities, we believe we are doing more for the successful conduct of the war than we can possibly do otherwise."

Associated companies.—"Of the foreign brake companies in which you are interested, largely through your ownership of a majority of the capital stock of the Westinghouse Brake Company, Ltd., of London, we can report that under the circumstances they are more than meeting expectations. . . . The manufacturing facilities of the French and Russian companies being largely absorbed in the production of munitions of war, our Wilmerding plant has been called upon to supply a large amount of brake apparatus for the cars and locomotives built here for use in France and Russia. While it has been a pleasure to serve our government and our allies in this way, the necessity of conforming to foreign standards has rendered the task more difficult and less profitable than it would have been to produce an equal volume of our standard products."

Locomotive Stoker Company.—"In 1913 your company was instrumental in the incorporation of the Locomotive Stoker Company, formed for the purpose of manufacturing a mechanical locomotive stoker which had been developed by the patentee under the direction of your management. During 1916 the operations of this company were transferred from Schenectady to the old air brake plant in Allegheny, and basing our views on the results so far achieved, we believe that the controlling interest held by your company in the Locomotive Stoker Company will prove to be a profitable investment and that the devices produced by this company will be of great benefit to the railroads of the country. To June 30, 1917, 1,555 stokers were sold and installed, leaving orders on hand sufficient to absorb present facilities during the remainder of the year."

Union Switch & Signal Company. "At the special meeting of stockholders held on March 15, 1917, which was called for the purpose of voting for or against the ratification of the agreement previously made by your board of directors for the exchange of shares of Westinghouse Air Brake Company stock for not less than 60 per cent of the issued and outstanding shares of Union Switch & Signal Company stock, and for other purposes, the agreement in question was ratified and confirmed by a practically unanimous vote. As a result of this action, the Westinghouse Air Brake Company now holds 9,410 shares of the preferred and 118,375 shares of the common capital stock of the Union Switch & Signal Company, representing about 95.9 per cent of its total capitalization. Under substantially the same management and

direction as that of your own company, the Union Switch & Signal Company has made rapid progress in the rehabilitation of its Swissvale plant, which was partially destroyed by fire on February 10, 1917. It is expected that the new shops, of reinforced concrete construction and exceptionally well designed, will be in full operation by the close of the calendar year. In the meantime, the temporary buildings erected in 1915 for the manufacture of munitions have been utilized to the fullest extent and the company has thus been enabled to meet the immediate requirements of its railroad patrons and in so doing maintain both its organization and its position in the trade. Conducted under many difficulties and without the aid of up-to-date facilities that are essential to economical production, these operations have shown little or no profit, but they have served a valuable purpose and the future outlook is promising."

Business Outlook.—"Current demand for brake equipment exceeds our immediate productive capacity, and, including business booked for export, the value and volume of unfilled orders on hand surpasses the normal figure at this season of the year. Until the question of taxation is finally determined, it is impossible to make any prediction as to the probable financial results of the fiscal period on which we have entered."

The general balance sheet follows:

ASSETS	
Cash	\$3,112,404
Accounts and bills receivable	5,190,658
Inventory	9,075,161
Deferred charges to operation	81,626
Investments in associated companies, etc.	15,622,586
Factories, less reserves for depreciation	6,535,921
Real estate, other than for factories	1,972,353
Patents and goodwill	2,485,850
	\$44,076,559
LIABILITIES	
Accounts payable	\$1,613,885
Accrued liabilities	247,275
Federal taxes estimated	643,134
Contingent liability on acct. of sales, subject to future settlements	335,951
Capital stock	28,868,200
Accumulated funds—	
(1) Sundry reserves	3,719,640
(2) Contingent surplus, excess par value capital stock of Am. B. Co.; over value on books of W. A. B. Co.	1,000,000
(3) Surplus, applicable to dividends	7,648,474
	\$44,076,559

TRADE PUBLICATIONS

A FEW DEVICES—IN FOUR LANGUAGES.—The Q & C Company, New York, has recently issued a catalogue for foreign distribution describing the company's line of railway appliances in four languages, English, Spanish, Russian and French.

LOCOMOTIVES.—The Baldwin Locomotive Works, Philadelphia, Pa., has recently issued Record No. 87 on the subject of military supplies. In this pamphlet is included a description of what the Baldwin Locomotive Works has done for the war, mentioning the Consolidation type locomotive built for the United States government, giving a record of the time in which this locomotive was built.

JOURNAL BOX PACKINGS.—The Franklin Manufacturing Company, Franklin, Pa., has recently issued a 26-page pamphlet on the subject of journal box packings. It contains interesting information on the general subject, explaining the properties of good journal box packings and the results that should be obtained from it. The method of manufacturing the packings sold by this company is described, being supplemented by interesting photographs. The materials used in the manufacture of packing are also mentioned and described. A suggested specification for journal box packings is included. The catalogue contains information of particular interest; it brings out the point that journal box packing is not "waste" and that there is not available sufficient high grade wool waste to supply all the railroads. The number of the catalogue is FC 6-17.

FOREST NURSERY AT URUGUAYAN STATION.—At Toledo, a small station on the Central Uruguayan Railway, the Argentine Government maintains a nursery and either gives away or sells at actual cost very young trees for transplanting. In connection with this forest nursery a poultry culture farm is maintained, which is a center of interest to the surrounding country, and all the well-known American breeds of fowl are prominently displayed in fairly large numbers.

Railway Construction

CUYUNA SOUTHERN.—This company will build a steam line from Deerwood, Minn., to St. Paul. C. Adams, Deerwood, Minn., president.

KINDER & NORTHWESTERN.—The proposed construction of 35 miles of line to connect this road with other local lines, mainly in lumber service, will proceed as soon as approval of the consolidation of the companies involved is received from the Interstate Commerce Commission. Alfred Mead, vice-president, Kinder, La.

MINNEAPOLIS & ST. LOUIS.—This company will award a contract some time this month for the erection of a bridge over the Minnesota river near Carver, Minn. The steel, consisting of six deck-girder spans, weighing 220 tons, was fabricated last year, and the foundation work, consisting of reinforced concrete on piling, is being done by the Widell Company, Mankato, Minn., and is about three per cent completed.

SOUTHERN PACIFIC.—This company has instituted a program of extending every station passing track between Blue Canon, Cal., and Truckee to enable the company to handle trains of 55 to 57 cars instead of 45 as at present. During the last few years over \$12,000,000 has been spent on the construction of second track from Rocklin, Cal., to Blue Canon, and Sparks, Nev., to Truckee, Cal.

Railway Financial News

BOSTON & MAINE.—Federal Judge Morton, of Boston, has directed James H. Hustis, temporary receiver, to pay the interest on \$2,000,000 of notes of the Connecticut River Railroad, a leased line, due August 31 last.

CONNECTICUT RIVER.—See Boston & Maine.

DENVER & RIO GRANDE.—E. L. Brown has been elected director and president to succeed H. U. Mudge, resigned. Kingdon Gould, who is now in military service, has resigned as a director and has been succeeded temporarily by S. N. Rice.

The sum of \$3,064,635.03 has been paid by J. P. Morgan & Co. for Liberty Loan bonds of the first issue of a par value of \$3,032,400 at a public auction sale conducted by Thomas D. McCarthy, United States Marshal, on the steps of the New York County Court House. The purchase price was \$100 more than the face value of the securities plus accrued interest. The bonds were seized by the marshal under a judgment recently obtained against the Denver & Rio Grande by the Equitable Trust Company, as trustee, for upward of \$38,000,000. The amount was for alleged liability of the Rio Grande on a guarantee of a mortgage bond issue of the old Western Railways Company which was foreclosed with a resultant deficiency.

MINNEAPOLIS & ST. LOUIS.—At the annual meeting of the stock holders, F. S. Letts, F. A. Chamberlain and F. E. Kenaston were chosen new directors. The retiring directors have been re-elected.

PERE MARQUETTE.—This company has declared the regular quarterly dividend of 1 1/4 per cent upon the prior preference stock, payable November 1 to stock of record October 15. This is the second dividend upon this issue and the first at the regular quarterly rate, the former dividend having been for an irregular period following the reorganization of the company.

SOUTHERN RAILWAY.—Augustus D. Julliard and Jackson E. Reynolds, both of New York, have been elected to fill vacancies on the board of directors. The retiring directors have been re-elected.

Railway Officers

Executive, Financial, Legal and Accounting

John Dickie, chief clerk in the treasurer's office of the Chicago, Milwaukee & St. Paul at Chicago, has been appointed assistant treasurer.

B. L. Bugg, general manager of the Atlanta, Birmingham & Atlantic, with headquarters at Atlanta, Ga., has been elected also a vice-president.

M. C. Kennedy, president of the Cumberland Valley, with headquarters at Chambersburg, Pa., has been granted an indefinite leave of absence.

George H. Campbell has been elected president of the Kentucky & Indiana Terminal Railroad, with office at Baltimore, Md., vice H. W. Miller.

E. L. Brown, former president of the Minneapolis & St. Louis has been elected president of the Denver & Rio Grande to succeed H. U. Mudge, resigned. A photograph and a biographical sketch of Mr. Mudge were published in the *Railway Age Gazette* of November 12, 1915, page 900.

G. L. Winlock, auditor of overcharge claims of the New York, New Haven & Hartford at Boston, Mass., has been appointed freight claim agent, with office at Boston, in charge of loss, damage and overcharge claims, succeeding G. Marks, assigned to other duties, and the office of auditor of overcharge claims has been abolished.

Operating

G. F. Gaunon has been appointed superintendent of the Savannah & Atlanta, with office at Savannah, Ga., vice J. S. Douglas, resigned.

H. E. McGee has been appointed superintendent of the Parsons district of the Missouri, Kansas & Texas, with office at Parsons, Kan., vice J. L. Walsh, transferred.

M. W. Sullivan, superintendent of the Delaware & Hudson at Plattsburg, N. Y., has been appointed superintendent also of the Naperville Junction Railway, with headquarters at Plattsburg, N. Y.

F. W. Lyons has been appointed trainmaster on the Minnesota division of the Northern Pacific, with headquarters at East Grand Forks, Minn., vice F. M. Smith, granted leave of absence to enter military service.

W. J. Sullivan, chief dispatcher of the St. Louis-San Francisco at Birmingham, Ala., has been appointed assistant superintendent of the Willow Springs subdivision, with headquarters at Thayer, Mo., succeeding H. E. Gabriel, who has been relieved to accept service in the United States Army. E. E. Owens succeeds Mr. Sullivan at Birmingham.

A. W. Jones, superintendent of telegraph of the Philadelphia & Reading at Reading, Pa., has been appointed assistant superintendent of the New York division, with office at Reading Terminal, Philadelphia, and L. D. Shearer has been appointed superintendent of the Philadelphia, Reading & Pottsville Telegraph Company, with office at Reading, vice Mr. Jones.

H. C. Oviatt, whose resignation as general superintendent of the Lines West of the New York, New Haven & Hartford was announced in these columns last week, has entered the service of the American International Corporation, division of ship building, and is now in charge of transportation at the corporation's ship building works near Philadelphia, Pa.

J. A. McCrear, general manager of the Long Island, at New York, having been granted an indefinite leave of absence, the position of general manager will be filled by John R. Savage, chief engineer; and J. A. Morris, valuation engineer, will act as chief engineer. W. E. Canning, freight trainmaster at Jamaica, and Ralph Peters, Jr., assistant trainmaster at Jamaica, have been appointed assistant superintendents assigned to special duties.

Traffic

Frank M. Jordan has been appointed commercial freight agent of the Baltimore & Ohio, with headquarters at Wheeling, W. Va., vice W. H. Eaton, promoted.

Walter A. Carlsen has been appointed general agent of the Missouri, Oklahoma & Gulf, with headquarters at Chicago, to succeed C. E. Christopher, resigned to engage in other business.

R. B. Kinkaid, chief of tariff bureau of the Cincinnati, Indianapolis & Western at Indianapolis, Ind., has been appointed assistant general freight agent in charge of tariffs, and the office of chief of tariff bureau is abolished; F. C. Boorman has been appointed commercial agent, with office at Milwaukee, Wis.

C. W. Galligan, whose appointment as freight traffic manager of the Chicago & Alton was announced in the *Railway Age Gazette* of October 5, was born at Cairo, Ill., in October, 1868. He first entered the railroad service at Cairo in 1885, at the local freight office of the Cairo, Vincennes & Chicago, now the Cairo division of the Cleveland, Cincinnati, Chicago & St. Louis. In 1888, he was transferred to the general freight office of the same road as rate clerk, and in 1889 was promoted to chief clerk in the same office. When the Cairo and St. Louis divisions of the Big Four were consolidated in 1890, he was transferred to St. Louis, Mo., as chief clerk to the assistant general freight agent in charge of the newly formed division. In 1892, he was appointed contracting freight agent, with office at St. Louis, and on August 1, 1895, was appointed general freight agent of the St. Louis, Chicago & St. Paul. In January, 1900, when the latter road was absorbed by the Chicago, Peoria & St. Louis, he was appointed assistant general freight agent, with office at St. Louis. On October 1, 1906, he was promoted to general freight agent, with headquarters in the same city, and on September 15, 1912, went to Chicago, Ill., to become general freight agent of the Chicago & Alton. On May 1, 1916, he was promoted to assistant freight traffic manager, with headquarters in the same city, and on October 1, 1917, was promoted to freight traffic manager, the former position being abolished.

F. Montmorency, assistant general freight agent of the Chicago, Burlington & Quincy lines west of the Missouri river, at Omaha, Neb., has been promoted to general freight agent, with the same headquarters, succeeding H. H. Holcomb, who has been promoted as assistant freight traffic manager, with headquarters at Chicago.

George C. Conn, freight traffic manager of the Pere Marquette at Detroit, Mich., has resigned, effective November 1, to become associated with the Buick Motor Company, Flint, Mich. Except for five years, when he was general freight agent of the Minneapolis, St. Paul & Sault Ste. Marie, Mr. Conn has been with the Pere Marquette for 20 years.

J. C. Hext, freight soliciting agent of the Southern Railway at Charleston, S. C., has been promoted to commercial agent at Charleston, succeeding E. M. Ramsey, resigned to enter military service, and A. B. Hammond, traveling freight agent at Charlotte, N. C., has been promoted to commercial agent at Athens, Ga., succeeding H. E. Williams, resigned to enter military service.

F. E. Hollingshead, general agent of the Chicago, Burlington & Quincy at Hannibal, Mo., has been promoted to assistant general freight agent, with headquarters at St. Joseph, Mo., succeeding A. L. West, deceased. T. L. Lawrence, general agent at Atchison, Kan., has been transferred to Hannibal, to succeed Mr. Hollingshead. E. L. Speer, commercial agent at St. Joseph, succeeds Mr. Lawrence as general agent at Atchison.



C. W. Galligan

Engineering and Rolling Stock

H. R. Voelker, foreman in the shops of the Pennsylvania Lines West at Bradford, Ohio, has been promoted to general foreman in the shops at Louisville, Ky.

Henry C. Eich, whose appointment as superintendent of motive power of the Chicago Great Western, with headquarters at Oelwein, Ia., was announced in the *Railway Age Gazette* of September 28, was born in Chicago. On January 2, 1883, he entered railway service as an office boy in the general offices of the Illinois Central at Chicago, and subsequently became machinist apprentice in the Weldon shops, Chicago. He was then successively machinist in the Weldon shops, locomotive fireman, gang foreman at the Burnside shops, general and roundhouse foreman at Freeport, Ill., division general foreman at Louisville, Ky., and master mechanic at East St. Louis, Ill., Memphis, Tenn., and at the Burnside shops at Chicago. He held the latter position until his appointment as superintendent of motive power of the Chicago Great Western on October 1.



H. C. Eich

Special

J. B. Morecock is now secretary of the fire prevention committee of the Seaboard Air Line, with headquarters at Norfolk, Va.

Railway Officers in Military Service

H. E. Gabriel, assistant superintendent of the Willow Springs subdivision of the St. Louis-San Francisco at Thayer, Mo., has resigned to enter military service.

E. M. Smith, trainmaster of the Minnesota division of the Northern Pacific, at East Grand Forks, Minn., has been granted leave of absence to enter military service.

E. M. Ramsey, commercial agent at Charleston, S. C., and H. E. Williams, commercial agent at Athens, Ga., of the Southern Railway, have resigned to enter military service.

B. M. Lockard, assistant engineer in the engineering department of the Chicago & North Western, has received a commission as captain in the Engineer Officers' Reserve Corps.

The President's nomination of W. W. Atterbury, director general of transportation for the U. S. expeditionary forces in France, for appointment to the rank of brigadier general, was confirmed by the Senate on October 4.

C. D. Symes, signal inspector of the Duluth, Winnipeg & Pacific at Virginia, Minn., has received a commission as first lieutenant in the engineer corps of the United States Army and is now stationed at Fort Leavenworth, Kan.

OBITUARY

Robert H. Large, coal traffic manager of the Pennsylvania Railroad at Philadelphia, Pa., died on October 8, at the University Hospital, Philadelphia. He was born on October 31, 1875, at Philadelphia, and entered the service of the Pennsylvania Railroad in 1895 as a rodman in the maintenance of way department. He subsequently served in various clerical positions in the freight department, then as freight solicitor and later as special agent. In June, 1903, he was appointed division freight agent of the Pennsylvania Railroad at Altoona, and in February, 1905, became coal freight agent. He was appointed general coal freight agent in May, 1910, and since May, 1916, was coal traffic manager.

Railway Age Gazette

Volume 63

October 19, 1917

No. 16

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Many railroads have long since seen the necessity for cutting down on their time tables, but it is apparent that the economy along this line has not by any means been carried as far as it might be. Railroad time tables and folders are of all sorts and kinds; but they all cost money and much more than they used to cost. There was a time, not so many years ago, that time tables were issued in such quantities that a large proportion of them had to be destroyed at each change of time. That condition has now been remedied on nearly every road, but there is still much waste. Ticket agents, when asked for a time table between two particular points, pass out a complete booklet of almost all the trains on the system, when a very small folder giving only the trains in which the passenger is interested, would suffice. This is, of course, a tremendous waste. The big booklet may cost two cents, five cents, or more, whereas the little folder could be had at the rate of 10 or even 20 for a cent. It is evident, then, that agents should be cautioned not to give away a big booklet when a small folder will do. The president of one large road in the east recently ordered his passenger department to reduce the number of winter time tables by one-half. Another road carrying a very heavy passenger business has carried the step even further. On this road there is now one 96-page folder giving all the passenger trains on the entire system. The various tables are so correlated and arranged that each page or pair of pages is complete in itself. In other words, so made up that the first two tables give all the through trains between X and Y with all information as to car equipment, the second two give all the suburban trains on the Y division in and out of X etc. Thus, pages one and two can be electrolytically typed, and made up as a complete time table of all the through trains between X and Y or pages three and four as a complete time table of the local trains out of X, etc., and put in a small, cheap leaflet that serves the purpose just as well as the big booklet, is much more convenient and costs only one-tenth or one-twentieth as much. The agents are cautioned to give out the small folders whenever possible and when they order, say, 100 of each the large and small, they are given possibly 175 of the small and only 25 of the large. But, one very important thing is emphasized. The notice to the agents

says: "When it is necessary to give a passenger information it should be given out unhesitatingly. If, however, you know the request is merely one based on curiosity, and the passenger is one whom you know can be fully satisfied with one of the smaller leaflets, try to make the small leaflet do the work." There are many other roads on which this idea could be carried out. It will certainly save a lot of money and paper; and both are hard to get these days. As for the passenger, he usually does not specially desire to be handed an expensive time table just to glance at the time of a single train.

It is the patriotic duty of every person to subscribe for the Second Liberty Loan and to encourage others to do so.

The Liberty Loan Among Railway Employees

A number of the railroads have already made large subscriptions to this cause, and many have brought the loan to the attention of their employees in one way or another. Several roads have also offered to finance the purchasing of these bonds for their employees, allowing them to pay for them in instalments. The engineer in charge of track elevation on the Chicago, Rock Island & Pacific, at Chicago, has gone a step further in bringing this loan to the attention of his employees. About 500 men are now employed on this work, including hoboes, Italians, Greeks, Austrians and other nationalities. A few days ago he arranged for four Liberty Loan solicitors and a speaker to accompany him on a trip over this work; each gang was visited on the job, and the general plan was outlined to the men directly and through interpreters where necessary. Following this the men were gathered together in a large meeting at the noon hour and the matter was presented to them again. They were told in simple language what the purpose of the loan was, its security and its other advantages. They were also advised that the company would make arrangements with a bank to carry these bonds on an instalment plan until they were able to complete payments for them. The result was not only an exceedingly enthusiastic meeting, but over 100 men subscribed at that time or over 25 per cent of those present. In one foreign gang over 30 per cent of the men subscribed. Other subscriptions are still being received, so that it is expected that one out of every three men among these laborers will have taken a bond.

Some of the men paid as much as \$50 in cash. An interesting development was the fact that a considerable number of subscriptions were received from Austrians. If results such as these can be secured among employees commonly regarded as least susceptible to appeals of this character, the possibilities of extending such a campaign among all classes of employees can scarcely be estimated. The incident offers a suggestion as to means of bringing the loan to the attention of other employees. A similar procedure was successfully used on many roads for the first Liberty Loan.

It is hard to break confirmed habits. Getting out of a well worn rut is no simple task, and yet the conditions under

Stop Unproductive Work

which the railroads are laboring are so abnormal and the stress is so great that it would seem that there could be no question as to the realities of the war conditions and the fact that all unessential and unproductive work should be pushed to one side and forgotten until after the struggle is over. There is a severe shortage of labor and the railroads have lost many men from supervisory and official positions. The shortage is so great that it is absolutely necessary to decide upon those parts of the work that can be cut down or overlooked for the time being without affecting the more essential work. It seems out of place, for instance, to find a large committee of capable car interchange inspectors touring the country to discover abuses of the M. C. B. rules and spending months in investigating minute details. Such a committee is bound to find many mistakes at this time but it is doubtful if its efforts can remedy the situation to any great extent. The roads are struggling along with the car maintenance problem as best they can with a large amount of green help and many foremen and inspectors who have recently been promoted from the ranks and have had very little coaching or training in their new positions. This is particularly true in industrial centers where the extremely high wages paid have drawn many men away from the railroads. The seriousness of the labor situation is indicated by the fact that men who have served for many years on roads with pension systems and relief funds are leaving the service and surrendering all their rights. It would seem that the members of a committee such as that mentioned above could put in their time to far better advantage by giving intensive service on their own roads in helping to supervise and direct the efforts of those foremen who are not thoroughly acquainted with their new work and also to the education of the green men. Never was there greater need of intensive educational work among railway employees, and this situation is further complicated by the fact that women are daily being employed in larger and larger numbers in all departments.

ENORMOUS INCREASE IN FREIGHT TRAFFIC

IN the month of July the railways of the United States handled 48 per cent more freight traffic than in July, 1915, and 49 per cent more than in July, 1914. The Railroads' War Board has just issued statistics showing that the ton mileage of freight handled in July, 1917, was 20.2 per cent more than it was in the same month of 1916. This increase in the traffic handled reflects a remarkable performance in view of the fact that the traffic of 1916 far surpassed all records up to that time. Because 1916 was a record year it is necessary to compare the results being obtained now with those of years prior to 1916 in order to realize fully the magnitude of the achievements of the railways in handling the present volume of business as well as they are. The increase in freight traffic in July, 1917, over July, 1915, exceeded the annual freight business of the railways of Japan, Spain, Sweden, New South Wales, Switzerland and Brazil combined.

It should be borne in mind that there has been almost no

increase in railway facilities within the last two years. There was an actual decrease in the number of locomotives and freight cars in service on June 30, 1916, as compared with the number in service on June 30, 1915. The number of locomotives and freight cars has increased within the last year, but the number now in service certainly is not more than 1½ per cent more than it was two years ago. In other words, the roads are handling 50 per cent more traffic than they were two years ago with perhaps 1½ per cent more locomotives and cars. Of course, business was comparatively dull at this time two years ago. There were 265,000 surplus freight cars on August 1, 1915; on the other hand, there is a car shortage now; but there would be a vastly larger number of unfilled requisitions for freight cars if there had not been within the last two years an enormous increase in the efficiency with which railway equipment is operated.

We note that the coal mine operators of the country have a friend in official life at Washington. The United States Geological Survey has issued a statement to the press dated October 11, which bears the caption, "Coal Mines Doing Their Bit," "Daily Output of Coal Breaks All Records to Meet This Year's Demands," "1917 Tonnage Promises to Exceed 1915 Records by 25 Per Cent." If the coal mines are "doing their bit" by increasing their output 25 per cent as compared with 1915, what may be said for the railways which are handling 50 per cent more traffic than in 1915? The record being made by the mines is fine, and deserves all the commendation which can be bestowed upon it. We could wish, however, that there was some government department which would show as much pride regarding what the railways are doing as the Geological Survey very properly shows regarding what the mines are doing, for the achievement of the railways is relatively greater than that of the mines.

OFFICIAL MISREPRESENTATION OF THE RAILWAYS

MAN THELEN, who is president of the California Railroad Commission and also president of the National Association of Railway Commissioners, is an able, intelligent and public-spirited man. He is one of the most capable men included in the membership of the state railway commissions. In his recent address as president of the National Association of Railway Commissioners he patriotically urged upon the state commissions the duty of co-operating in every way they can with the railways and other public utilities in order to enable these concerns to operate with the utmost efficiency and thereby contribute their share toward the winning of the war. Since the *Railway Age Gazette* has so high an opinion of Mr. Thelen, and since his address was admirable in many respects, it is with regret that we feel obliged to call attention to a number of indefensible misrepresentations of the railways to which he gave the support of his name and position.

In one place he refers to the action of the railways in deciding, as he says, "to operate as a single consolidated American system and in doing so to eliminate a portion of the waste and inefficiency which were pointed out by the Interstate Commerce Commission in the five per cent rate case and which for years have been recognized and commented upon by state railroad commissioners and other students of railway problems." We should like to have Mr. Thelen tell us where in its opinion in the five per cent advance rate case the Interstate Commerce Commission pointed out the "waste and inefficiency" to which he alludes, and then show us what relationship there is between what the Commission said and what the railways are now doing and attempting to do. The Commission cited many ways in which the railways could increase their revenues by making special charges for special services, but we have sought in vain for a single word in its opinion which pointed out such "waste and inefficiency" as

Mr. Thelen refers to. We boldly assert that there is no such word in it.

In another place Mr. Thelen says, "While the carriers were at first largely in favor of the valuation, they seem now to be generally opposed to the ascertainment of the facts by the Federal Government." The *Railway Age Gazette* has observed the development of the valuation propaganda from its inception, and it does not know of a single railway corporation or railway officer who ever favored "the valuation," by which Mr. Thelen must mean the one provided for by Congress and now being made by the Interstate Commerce Commission. On the contrary, the railways always have opposed valuation on the ground that it does not afford a sound basis for the regulation of rates. They acquiesced in the legislation fathered by that great friend of the Prussians, Senator LaFollette, because they believed that valuation would show that the railways as a whole were not over-capitalized and that therefore, while it would cost a lot of money, it would not do any other harm; but they never "favored" this legislation. Why, then, does Mr. Thelen allege that the railways formerly favored the valuation but are now opposed to its continuance? We challenge his statement as being without foundation and offer our columns to him in which to substantiate it.

In another place Mr. Thelen criticizes the railways upon the ground that duplications of their facilities, their service, and in consequence, of their operating expenses, has resulted in waste. We ask him if it is not a fact that the entire policy of our legislation in the United States has been to cause unrestricted competition between railways and the duplication of facilities of service and of operating expenses which is necessarily incidental to such competition. If, as we contend, these duplications have been not only encouraged, but actually compelled, by law, then does Mr. Thelen think he is justified in referring to them in such a way as to imply that the management of the railways are entirely responsible for them? The *Railway Age Gazette* was engaged in pointing out the duplications of service to which Mr. Thelen refers long before he ever discovered that they existed. Since, however, as Mr. Thelen must have known if the railway managers had got together and agreed to eliminate them they would have been put in jail for violating the Sherman law, we contended that the government as well as the railway managements was responsible for them. Doesn't Mr. Thelen also think that the government had and has some responsibility for them? If so, why doesn't he say so? Doesn't he know that the railways would not have been permitted before the war to have adopted the measures they recently have adopted for the elimination of competition and of the waste to which it leads? If so, why doesn't he say so?

And, speaking of duplications of service and expense, doesn't it occur to Mr. Thelen that there may also be some waste in the duplication resulting from regulation being carried on by Congress, by the Interstate Commerce Commission and by the legislatures and commissions of 48 states? We should like to see the duplications of service and expense in railway operation eliminated. We should also like to see the duplications of service and expense in railway regulation eliminated. Since we agree with Mr. Thelen on the former point, will he agree with us on the latter point?

Mr. Thelen says that "what the railroads are now doing is being patriotically done and deserves and is receiving the unstinted praise and commendation of all American citizens." Then he adds, "The other conditions to which I have referred must be remedied if our transportation system * * * is to measure up to the standard of national efficiency which the people of the United States will imperatively demand after the war." Perhaps Mr. Thelen can think of some other industry in the United States which is managed with greater relative efficiency than the railroads, and will tell us why he thinks it is better managed. Perhaps, also, he has in mind

some other railway system in the world which he thinks is better managed than ours, and will tell us why he thinks it is better managed. We long to be enlightened.

The railway system of the United States has, of course, at times been diseased in some of its members. Taken as a whole, however, it is the most efficient and vigorous business enterprise in the country. Unfortunately, most of our regulating authorities are not interested in the physiology of the railway business, but concern themselves solely with its pathology.

SOUTHERN RAILWAY

THE increased cost of fuel and the increase of trainmen's wages due to the enforcement of the so-called eight-hour law, in the last half of the fiscal year ended June 30, 1917, kept the Southern Railway's showing in the fiscal year from being as good as it otherwise would have been; but despite these increased expenses the year was a very prosperous one for the company. President Harrison, in his annual report, naturally and properly lays great stress on the rapidity and extent of the commercial, industrial and agricultural growth of the southeastern states. At last that ideal for which Mr. Harrison and his predecessor—the late Mr. Finley—worked so hard is being attained. The South is raising sufficient foodstuffs and livestock for its own needs. Add to this the fact that in the current year government estimates place cotton production at 6,357,000 bales, or 19.35 per cent higher than a year ago, and one realizes the foundation on which President Harrison's enthusiasm rests.

The Southern Railway earned \$81,388,000 in the year ended June 30, 1917, an increase of 14.46 per cent over the previous year. This is on an average of \$11,655 per mile, comparing with \$9,967 earned per mile in 1916. It was only 16 years ago that the Southern Railway was earning a little over \$5,000 per mile gross. Of the total operating revenues of \$81,388,000 in 1917, \$54,864,000 was from freight service and \$23,708,000 from passenger train service, the remainder being other transportation revenue, and incidental revenue. The increase in freight revenue, which amounted to \$6,672,000, was due to a greater movement of nearly all classes of commodities. The greatest increase was in the tonnage carried of manufactures and miscellaneous. The revenue from this tonnage amounted to \$16,202,000, or an increase over 1916 of 24.91 per cent. Products of agriculture yielded \$9,662,000 freight revenue, an increase over the previous year of 8.37 per cent, and products of mines yielded \$9,545,000 freight revenue, an increase of 12.91 per cent.

To offset the increased wage scales and fuel costs the principal gain in freight service in operating economies was through better carloading. The average load per loaded car in 1916 was 19.85 tons, and in 1917, 21.05 tons, an increase of 6.05 per cent. There was a small gain in trainloading, the average trainload of revenue freight being 373 tons in 1917, as against 365 tons in 1916, an increase of 2.36 per cent.

Unlike many other roads, the Southern Railway was not helped materially in making a better trainload showing by having a better balanced traffic. The loaded freight car mileage increased 6.34 per cent, and the empty freight car mileage 6.24 per cent. The total number of cars per train was 30.02 in 1917 and 31.54 in 1916. In other words, the heavier trainload was accounted for by better carloading. The total cost of transportation (the out of pocket cost of moving freight and passenger business) was \$3,815,000 in 1917, an increase over 1916 of 16.64 per cent. In the last half of the fiscal year (January to June, 1917) transportation expenses amounted to \$14,415,000 as compared with \$12,334,000 in the previous year. It was estimated that the effect of the eight-hour law and the advanced cost of coal

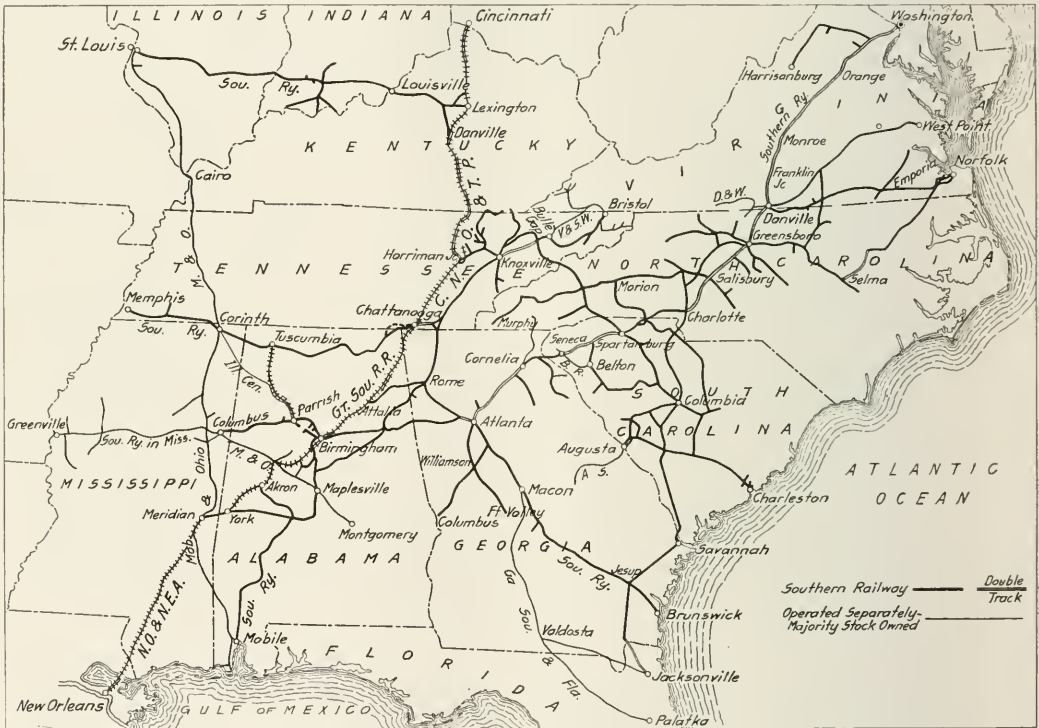
alone increased transportation expenses in these six months by \$1,394,000.

In passenger service the management was able to effect very considerable economies and, moreover, there were more than 17,000,000 passengers carried without the loss of a passenger's life in a train accident. The total number of passengers carried one mile was 888,805,000, an increase of 14 per cent. The average passenger journey was 50 miles in 1917, as against 46 miles in 1916, and the receipts per passenger per mile were 2.145 cents in 1917 and 2.124 cents in 1916. With the increase of over 14 per cent in passenger mileage there was an increase of only 2.96 per cent in passenger-train mileage, and the average number of passengers per train was increased from 47.56 in 1916, to 52.90 in 1917.

The Southern Railway has applied the formula prescribed

betterments expenditures were \$1,053,000 for grading, \$1,-839,000 for bridges, \$731,000 for rails and \$617,000 for other track material. Additions to equipment cost \$5,898,-000 in 1917. Despite the shortage of labor the Southern Railway is keeping its freight cars in very good shape and the percentage of bad order cars to all freight cars on July 1, 1917, was only 2.32 per cent. This is a quite remarkably low percentage of bad order cars. The Southern has placed contracts for new equipment, including 25 Santa Fe, 12 Mallet and 8 Mountain type locomotives, and for 1,400 box cars and 1,313 gondola cars.

President Harrison makes two particularly interesting comments on the results of the year's operation. In speaking of additions and betterments he says: "The success of the company in handling, during the past year, a record traffic easily and without congestion, so building up its in-



The Southern Railway

by the Interstate Commerce Commission for the division of expenses and taxes between freight and passenger service. In passenger service the direct and assigned revenues per passenger-mile averaged 2.764 cents, and the costs assigned to passenger service, to 2.216 cents, leaving an operating income applicable to interest charges, etc., of 5.48 mills per passenger-mile.

In freight service revenues are estimated at 9.44 mills per ton per mile and expenses at 6.20 mills per ton per mile, leaving operating income of 3.24 mills per ton per mile.

Considerably larger amounts were spent for maintenance in 1917 than in 1916. Maintenance of way and structures cost \$10,138,000, an increase over 1916 of \$1,963,000. Maintenance of equipment cost \$12,372,000, an increase over 1916 of \$1,188,000. Besides the amount spent for maintenance, there was \$8,571,000 spent for additions and betterments to roadway. The larger items in the additions and

come balance, may fairly be attributed to the liberal policy of enlarging the plant which has been followed during the past year." And in speaking of the service of employees he says: "Despite disturbed labor conditions throughout the year and acute discussions of wages, the company has again had loyal and efficient service from its army of officers and employees. The management cordially acknowledges that whatever success has been secured is due to that co-operation and to the vigor with which work is done under the stimulus of the now established and recognized pride of the rank and file in their relation to the property." This is not the ordinary somewhat perfunctory acknowledgment of the thanks of the directors to employees and officers but has a ring of heartiness about it that carries conviction. Mr. Harrison, himself chairman of the Railroads' War Board, at Washington, has presumably had to devote a very considerable portion of his time to the work of this board in

its supervision over the operation of all the railroads of the country. It is a tremendous responsibility, and the fact that Mr. Harrison had built up an organization on the Southern Railway which could carry on the management of the Southern Railway in a year of unprecedented pressure of traffic, labor shortage, high prices of materials and increased labor costs as economically as was done in the fiscal year ended June 30, 1917, is a high tribute to his executive ability.

Since the close of the fiscal year the Southern Railway has resumed dividend payments on its preferred stock through the declaration of a semi-annual dividend of $2\frac{1}{2}$ per cent, payable November 20. There are two ways, of course, of looking at this question of the resumption of dividends. With a surplus, after paying interest charges, of \$12,360,000, the declaration of a semi-annual dividend on the preferred stock, calling for \$1,500,000 only, is conservative, and to the holder of Southern Railway preferred stock who is dependent on his or her income from investments for a living the resumption of dividends seems only fair. On the other hand, railroad credit is in such a state as to make long time financing by a road like the Southern Railway extremely difficult, if not impossible.

A comprehensive scheme of financing had been worked out by which a new refunding and improvement mortgage was to be the security for bonds which were to take the place of the development and general mortgage 4's which had hitherto been used for financing the needs of the property, but conditions were such that these bonds could not be sold at a satisfactory price. Instead an issue of \$25,000,000 two-year 5 per cent notes were sold, due March 2, 1919. It might be argued that with money as difficult to obtain for additions and betterments on railroads as it now is, the Southern Railway had better conserve to itself the \$3,000,000 a year which would be called for by 5 per cent dividends on the preferred and invest it in additions and betterments rather than to pay it out to stockholders. Presumably the board of directors felt that the company's credit could be more effectively strengthened by the resumption of dividends on the preferred than by investment in the property of \$3,000,000 additional in the next year. At the end of the year there were \$7,553,000 cash on hand, \$1,964,000 time deposits and \$3,079,000 special deposits. There were only \$455,000 loans and bills payable and \$182,000 of unextinguished discount on funded debt. There was \$845,000 discount on securities charged off during the year through profit and loss account and \$611,000 "net difference between the book value and selling price of securities sold" charged off.

Mention should be made of the acquisition of almost the entire stock of the New Orleans & Northeastern, by the Southern Railway. At the same time the Southern Railway disposed of all interest in the Alabama & Vicksburg and the Vicksburg, Shreveport & Pacific. As will be seen from the map, the acquisition of the New Orleans & Northeastern gives the Southern Railway an entrance into New Orleans and forms a through north and south line in connection with other allied lines of the Southern of great traffic importance.

The following table shows the principal figures for operation in the fiscal year ended June 30, 1917, compared with the fiscal year ended June 30, 1916:

	1917	1916
Average mileage operated.....	6,983	7,023
Freight revenue.....	\$54,863,694	\$47,020,489
Passenger revenue.....	19,061,964	16,615,857
Total operating revenue.....	81,388,325	69,997,675
Maintenance of way and structures.....	10,138,386	8,175,411
Maintenance of equipment.....	12,372,057	11,183,701
Traffic expenses.....	2,039,638	1,904,129
Transportation expenses.....	26,748,978	27,511,698
General expenses.....	2,199,449	2,038,702
Total operating expenses.....	53,630,136	46,041,116
Taxes.....	3,394,424	2,916,427
Operating income.....	24,353,443	21,004,005
Gross income.....	27,457,748	24,436,031
Net income.....	12,360,161	9,333,899
Reserve for preferred dividend.....	1,500,000	
Appropriations for additions and betterments.....	181,402	88,195
Surplus.....	10,678,759	9,245,704

Letters to the Editor

THE VITAL OBJECTION TO UPPER BERTHS

NEW YORK, N. Y.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I have read with interest the communication signed by "Traveler" in the August 31 issue of *Railway Age Gazette*, and it seems to me he has diagnosed the upper berth complaint very well indeed. The Pullman Company is to be congratulated upon the splendid progress made in recent years; but much remains to be desired.

Theoretically, the upper berth is the more desirable of the two; the springs are better, the air is purer and the climb up, while inconvenient, is not a vital objection with the average individual.

More provision for care of clothing and a window such as suggested would be desirable and would help to make the upper berths more acceptable; but to me, and to the very large number of men with whom I have discussed this question, the greatest single objection to an upper berth is that of light. There appears to be no adequate regulation covering this matter and in traveling over many different railroad systems I have found many different manners of handling this question. Some porters and conductors have been willing to shut lights off at 10:30, while others insisted upon retaining them at full blast until, and sometimes even after, midnight. There is the same divergence of attitude in the morning, as in some instances lights are turned on as early as half past four or five o'clock at the whim of a porter, while there are also happy occasions where one is allowed to enjoy the semi-darkness of an upper berth until half past six or seven o'clock, although such instances are about as rare as the proverbial hen's teeth, or an oasis in a desert.

In their natural desire to reduce the number of Pullmans necessary to properly care for a contented public, would it not be possible for the Pullman Company, pending the discovery of some method of keeping the car lighted without inconveniencing upper berth patrons, to establish a rule that all lights save berth lights shall be extinguished at not later than ten thirty at night and shall not be lighted before six thirty in the morning? Surely it is no more of a hardship for the occupant of a lower berth to retire by the two berth lights that are his than it is for the unfortunate holder of an upper berth to lie restless in the glare of heavy lights until eleven, eleven thirty or twelve o'clock, when the man downstairs gets tired of reading and is willing to allow the porter to turn off the annoying glare.

Any method of operation that leaves to the discretion of conductors and porters the adjustment of a matter that provokes so much unfavorable comment must be faulty. It seems to me that only a fixed ruling which bears in mind the need of the man in the upper berth for a fair chance to sleep can cover it.

I write from an experience of more than 25 years in Pullman travel and during this quarter of a century I have heard scores of men reluctantly taking upper berths protest against the inconvenience in undressing, but more than all against the inability to get lights turned off at a reasonable hour and the inability to keep them from being turned on at an unreasonable hour in the morning. In other words, is it not fair to the upper berth man to assume that after ten thirty a sleeping car should be what its name suggests, and not a social lounge or a comfortable well-lighted reading room?

A PULLMAN FRI. N.Y.

The Pressing Need of Prompt Co-operation*

Appeal to State Railroad Commissioners to Take Broad Views; States Should Co-operate in Railway Valuation

By Samuel Rea

President of the Pennsylvania Railroad

IN these times of great events, when history is being made daily, it is necessary for Nations, as well as individuals, to become accustomed to changed conditions and adapt themselves to new methods. Now, more than ever before, all political rights and powers existing within this country, must be exercised with the one primary purpose of protecting and defending our national sovereignty.

The Railroads' War Board, on which I have the honor to serve, exists as the creature of our national purpose. Its fundamental object is to unite the railways upon the great work of doing all that is within their power to aid the government in winning the war. It considers and deals with the railroads as a whole, from a national point of view, and is endeavoring to manage them in the best practicable way for the collective welfare of the country. Yet, everything we do is in full recognition of the constitutional and sovereign rights of the states and of their various peoples. These rights are not annulled or suspended by the war, but I wish to speak briefly concerning a few of the ways in which we feel that the regulative bodies of the various states can co-operate with the national regulative power, not only during the continuance of the war, but also to make permanently the railroads the most efficient servants of the public in the times of peace which are to come.

With a degree of co-operation on the part of the general public, which can scarcely be too highly praised, we of the War Board, are making very material progress toward obtaining the maximum service out of the transportation plant of the country. We are expediting traffic; carrying more tons to a car and to a train; moving freight cars and engines more miles per day; eliminating unnecessary train service; consolidating passenger trains; securing prompter unloading, and in many ways releasing men, trackage and equipment to care for the movement of troops, military supplies, food, fuel and other necessities. We are making priority shipments under mandate of the federal law. By our own agreement, we are moving empty cars about the country so as to put them promptly where they are most urgently needed, and are arranging the routing of traffic according to the best physical conditions, and without reference to benefiting individual roads. Other examples of subordination of the competitive activities of individual railroads to the general welfare, are: the efforts made in expediting coal shipments; in furnishing material for the cantonments; in providing additional facilities for new shipyards, industries and mines; in handling the movement of more than 700,000 troops to camp and to seaports for transportation abroad, and in other ways.

All of this means forcing of traffic out of its normal channels, foregoing profitable business and making great financial sacrifices at a time when it is extraordinarily difficult to conserve railroad revenues. We are face to face with an absolutely unprecedented scale of prices for all materials; wages are higher than ever known before; labor is difficult to obtain at any price, and much of it is incredibly inefficient; we are practically unable to obtain new locomotives, as France has the first call on the American supply, and similar conditions exist in the case of steel rails and many

other materials. We are daily made to feel more keenly the competition of industries in the labor market, because they are able to pay wages which the railroads cannot afford. Many of our best men volunteered in the military service months ago, and thousands more have just been taken in the draft. Nevertheless, the railroads have disregarded all of these factors which make operation difficult beyond precedent; they have put profits in the second place and national service in the first place.

My conception of public regulation of railroads is that expressed by that great railroad statesman, Alexander J. Cassatt, who died in office eleven years ago, when president of the Pennsylvania Railroad: that the railroads are, in the nature of things, partial monopolies, and that, therefore, in the public interest, their rates, practices and activities must be placed under governmental regulation; that this regulation must be protective not only of the communities, passengers and shippers which the railroads serve, but also equally of the owners and administrators of these great national properties which are now publicly owned, not by the government, but through a far higher type of public ownership, viz., by hundreds of thousands of individual citizens and the institutions in which they have their funds invested. You, the members of the state railroad commissions, form an important part of this great regulatory power which reaches all over the country. To the extent that you co-operate with the federal government in its supreme power of regulating interstate carriers, you are sharing in promoting the common defence and the general welfare. To the extent that you fail so to co-operate, even though you may appear to be benefiting certain citizens of your own state, you not only weaken the railroads, impair their service and destroy their credit, but also menace the national authority, conflict with its policy, and weaken the effective commercial and military power of the country.

It is to point out this situation and plead that your attitude may always be one of co-operation that I am here tonight. I appreciate what many of you have already done in helping us, on the Railroads' War Board, to do our work properly, and to make successful our efforts to aid the nation. May I suggest some other avenues in which state commissions may co-operate still further?

ABOLISH USELESS REPORTS

Let me first ask that you aid us by consenting to the abolition of all reports, documents and accounting requirements of all kinds which are not absolutely necessary to enable you to do your work. Opportunities for simplification are almost innumerable. Public regulation of the railroads, thus far, has simply added bureau upon bureau and authority upon authority, which have caused to be amassed uncounted and uncountable figures in millions of printed pages of reports, forming an undigested and useless mass.

When you go home, test the necessity of your various reports by cutting some of them out for a time—say for the continuance of the war,—and in that way ascertain whether or not they have real value. The railway accounting officers have asked you for certain relief from the excessive burdens; we need this relief most urgently, because of the many men who have been called to the colors from our accounting departments. It is a source of much gratification

*An address before the members of the National Association of Railroad Commissioners at a banquet at the New Willard Hotel, Washington, D. C., October 17.

that the federal and state commissions have accepted the calendar year, instead of the fiscal year of June 30, for annual reports and that the accounting classifications are now almost identical. But the field is a big one, and much further saving may be achieved.

THREE MILLION REPORTS IN A SINGLE YEAR

For the year ending June 30, 1915, I think the report prepared for the Newlands committee showed that, including duplicates made for the various federal and state authorities, almost 3,000,000 official reports were furnished by the railroads of this country. They consisted of annual and quarterly reports, tax reports, accident reports, equipment and other special reports. The Pennsylvania Railroad system alone furnished over 400,000. Let us cut these to the bone, and build up later if it is found that any which are eliminated are missed. This is the only way to get prompt relief, and promptness in this matter is most urgently essential.

113,965,747 PAGES OF PRINTED TARIFFS FILED AS A FORMALITY

The question whether or not the railroads needed a 5 per cent increase of freight rates, was necessarily a general one; but before the case could even be heard we had to file separate tariffs for every rate affected. The Pennsylvania Railroad system, which was merely one of the carriers involved, was obliged to spend, it is safe to say, \$450,000 for the tariffs which it was required to file, and our Lines West of Pittsburgh alone filed tariffs which made up the enormous and incomprehensible total of 113,965,747 pages, weighing a total of 302,883 pounds. Of course, there was no thought in the mind of anyone as to the possibility of reading or even casually examining all these tariffs, but it was necessary to print and file them because that was the procedure then in force.

Fortunately, since that time we have made some headway in bringing about a recognition of the needlessness of wasting so much time, effort and money in a formality. In the most recent rate case, which was begun last spring, the Interstate Commerce Commission suspended its rules of procedure and allowed the application for a flat advance to be made without the necessity for filing tariffs covering all the many thousands of rates involved.

STATE COMMISSIONERS SHOULD ATTEND I. C. C. HEARINGS

Co-operation by the state commissions with the federal government, in the matter of readjusting railroad rates to a reasonable basis, is a great field for assistance in stabilizing railroad credit, and removing conflicts between interstate and intrastate rates. It ought not to be necessary to spend weeks or months in painfully working out some rate adjustment with the Interstate Commerce Commission and then have to do the same thing with the state commissions in all states affected by the proposed changes. Nor should the spectacle be witnessed of a state virtually setting aside the superior authority of the federal government. I hope to see the time come when state commissions will regularly send their representatives to sit with the Interstate Commerce Commission during its hearings, for the specific and definite purpose of co-ordinating the action of the state commissions to what the federal commission may decide. I think in such cases the state commissions should be willing, without the necessity of a rehearing, to accept the proof heard before the federal commission, and allow the railroads to file rate tariffs in the states simultaneously with those filed with the national government. In view of the thoroughness with which the Interstate Commerce Commission scrutinizes all evidence upon which the railroads base their claims to any rate increases, I am sure that no state would be running the slightest risk of giving any railroad more than was its just due, while, at the same time, procedure would be greatly simplified,

and expense, both to the railroads and to the state governments, would be saved.

A CASE WHERE A STATE SET ASIDE THE FEDERAL AUTHORITY

One of our neighboring states, I regret to say, for a period of three years maintained a scale of intrastate passenger rates which conflicted with the interstate rates specifically authorized by the commission here at Washington. We had, therefore, during that long period the spectacle, which, I am sure, did not reflect credit upon our national capacity for self government, of a state setting aside the action of the superior federal power, while citizens of other states were encouraged to violate the spirit, if not the law, of the interstate commerce act by crossing into the state in question in order to circumvent the rates established by the Interstate Commerce Commission. I am glad to see that this matter has now been disposed of, and that the commission of the state to which I refer has at last consented to have its rates equalized with those established by the federal authority.

Let any of the representatives of the state commissions present here may feel shocked at the example which I have just given, let me direct their attention to the fact that in the Central Freight Association territory, there are still many intrastate rates which have never been readjusted to conform to the decision of the Interstate Commerce Commission in the five per cent rate case decided in 1914. I will not say a word as to the situation West or South.

At the present time, when the railroads are so urgently in need of additional revenues, it would be very helpful if, in view of the small increases conceded by the Interstate Commerce Commission in the rate case of this year, the various state commissions would all promptly act and allow the railroads to apply these rates to intrastate traffic also. I can assure you that what was granted is not half enough, but if the states would permit it to become fully effective the railroad situation would be materially aided. I feel that state commissions should regularly be represented at all federal rate hearings, and that, unless some extraordinary reason exists, should acquiesce in the judgment of the federal commission, and authorize all changes necessary to conform thereto without further proceedings.

NO ROOM FOR PARTISANSHIP

The failure of the states to take a proper place in the regulation of our railroads has given rise to great misgivings, and many states have allowed the railroads and investors—and I suspect the public—to feel that railroad regulation was rather a partisan question than a serious business and economic question. We want your co-operation, and co-operation means prompt action and leadership. In this country, when action and leadership are not forthcoming in the affairs of a corporation or any public body, it must eventually go to the scrap heap, and some other corporation or body must carry out the National will; but meanwhile the country suffers. We are deficient in terminal facilities and equipment because of insufficient earnings and unduly low rates since 1907; and the country and the business man are paying the price of neglect, notwithstanding all our efforts to help them. Bricks without straw cannot be produced. High costs, high taxes, and high wages cannot be paid without sufficient rates. The Pennsylvania Railroad faced the war of 1861 with average freight rates of 2½ cents per ton-mile, and the war of 1917 with average rates of slightly over 6 mills per ton-mile. Yet nearly everything that goes into the expense of railroad operation costs far more now than it did when the Civil War opened.

Testifying before the Joint Commission of the states of New York and New Jersey, yesterday, on port conditions in New York Harbor, I was obliged to point out the results of the unremunerative rates which the railroads have been com-

pelled to accept, stating that over \$20,000,000 should have been spent on the Pennsylvania's New Jersey yard and terminal facilities, to serve that port properly.

The situation is little different elsewhere. In Baltimore, embargoes exist and freight is being unloaded on the streets; the lines of the Philadelphia, Baltimore & Washington should have immediately spent upon them over \$10,000,000 for additional facilities. Our lines serving the lake ports and the Pittsburgh, Youngstown and other great industrial districts are suffering from embargoes; all, in my judgment, because the returns allowed to the Pennsylvania System have been entirely inadequate for very many years.

2385 RAILROAD COMPANIES

Another field for co-operation by the state commissions lies in aiding to bring about uniformity of state laws. The day is here for the consolidation and unification of railroad systems. No less than 2,385 separate railroad corporations report to the Interstate Commerce Commission and I hazard the guess that at least 2,300 of them could be merged into the bigger systems with vast benefit to the public and everyone else concerned.

There are still, in the Pennsylvania Railroad System, about 115 active transportation companies, all necessary, as matters now stand, for the conduct of the service. I think we will all agree that this is just 114 too many; but when we reflect that they represent what were originally more than 600 separate incorporated companies, we can feel that some progress is being made in the right direction. But in any question as to increased rates, the profits or losses of these separate companies play no part in the consideration of the matter by the Interstate Commerce Commission, which looks only to system results. In fact, little attention is given even to large individual railroad systems, because the country is so immense, and the interests of the public in all the states so intertwined, that the results of a whole region are considered, such, as for instance, the Trunk Line territory, or the Central Freight Association territory, or the entire railroad region lying between the Mississippi river and the Atlantic Ocean and between the St. Lawrence and Potomac rivers. Yet many of the state regulative bodies are still working under laws and powers that existed when roads ten miles long were being incorporated, and when a railroad meant little more than rail laid along a public highway. A national conception of transportation is wholly absent from the statutes of many of our States. For instance, prohibitions against the acquisition of so-called parallel or competing lines still exist, oblivious of the fact that a 10- or 20-mile stretch of intrastate line obviously must be competitive with a 12,000 mile interstate system running in the same general direction. Nor would such prohibitions, in any case, be heedful under our present stringent laws against discrimination. I am glad that there is less and less public sympathy with legal conceptions that are anachronisms, but we have still far too many laws and lawyers out of harmony with the actual conditions of today. It is in the highest public interest, for the furtherance of adequate transportation service, that every possible encouragement should be given for the merger, in law as well as in fact, of small lines into large systems, and whatever obstacles still exist against the accomplishment of such ends are stumbling blocks in the way of progress and stand in defiance of economic law. We need a broad, national recognition of this fact, and you men can greatly aid in bringing it about.

TRAFFIC POOLS SHOULD BE LEGALIZED

Even from the federal standpoint there is no longer any necessity for the application of the Sherman law to the railroads. All possible needs for its restrictions have been superseded and made obsolete by our present system of almost complete public regulation. We are having concrete proof of this right now, before our eyes, in the work which the Rail-

roads' War Board is doing in full co-operation with the Interstate Commerce Commission and the other federal authorities. Under the spur of the great necessities arising out of the needs of the common defense, we may be forced to go very far. In order measurably to protect the investment of the public in our railroads, and promptly secure needed transportation, we may be compelled to pool traffic and train service, shift locomotives from one line to another, and do many other things, in the nation's interest which are not now recognized by any law but the necessities of war.

I wish here to say, most unequivocally, that in my judgment, the pooling of traffic by the railroads is essential for the public service and should be affirmatively legalized, not only for the period of the war, but for all time. The restrictions of the Sherman law should not apply to the railroads, and mergers and combinations intended to increase efficiency, simplify accounting, and eliminate the wastes of competition, should not only be countenanced but encouraged, under public supervision and control.

The Pennsylvania Railroad is still a corporation of only one state, although its lines are operated in thirteen different states. We hesitate to become a corporation of other states because of the conflict and confusion of laws and regulation, and we look to the time when either the federal government shall take full and exclusive charge of all interstate transportation questions, including incorporation, security issues and rates, or else when the state and federal authorities shall so co-operate that only one line of decision and action shall apply. Then the owners, managers and the general public will be fairly protected, and railroad credit will be in the hands of responsible regulative authority.

What I say is not spoken with any hostility to state governments or state commissions, for under state charters we have lived and prospered in the past. But the time has now come, in this great nation, when it is no longer possible to administer, in the proper interests of the public, a railroad corporation that depends for guidance upon many different commissions with diversified laws, traditions and procedure, and still have the efficiency necessary for our continued national welfare. This lack of uniformity begins with the manner of incorporating a railroad company, and extends to capitalization, operation, and rates, and even to such matters as the width of the right-of-way and the method of electing directors.

THE STATE COMMISSIONS' FUNCTIONS

Let us not overlook the very important fact that, aside from questions relating to our great railroad systems, the state commissions have on their shoulders the responsibility of regulating and supervising hundreds of public utility enterprises, representing billions of dollars of invested capital and serving, in a truly intrastate sense, our great and growing communities. This is properly a duty of the state authorities and the responsibility of discharging it adequately will inevitably become more weighty and serious with the passing of every year. I am confident that in its intelligent performance you may, with profit to the public and increased prestige to yourselves, expend the full measure of your energy.

In the matter of railroad valuation, also, we need the co-operation of the states. We have a federal valuation law that is most difficult to interpret and, if carried out as tentatively proposed, will involve enormous cost, while the results may be of very doubtful value.

C. A. Prouty, the director of valuation, and an experienced railroad regulator, has recently said that the solicitor of the division of valuation holds "that the valuation act does not require the commission to find an ultimate value." In this Mr. Prouty acquiesces, but follows with the personal observation that it is "his conviction that an ultimate value for rate making purposes should be stated, and that the full benefit of this valuation cannot be realized unless this is done."

Mr. Prouty says that the act was the result of repeated recommendations of the Interstate Commerce Commission, which he understood provided for a valuation in dollars as a whole. Now, if congress has given us a law which does not enact the views of that body, and is not fair to the owners of the railroads and the public, why not forthwith try to correct the law, after full conference with the federal and state commissions and railroad representatives, with the results embodied in revised and explicit recommendations to congress? Failing to secure agreement, then why not recommend the suspension of the work and save an enormous expenditure which may have little value? Why, in this uncertainty, proceed further with this work, now requiring the labor and attention of about 1,500 men on behalf of the government, and about 4,500 men by the railroads, and costing ultimately over \$50,000,000?

I am one of the few railroad men who believe that federal valuation should be pushed to a conclusion, but I wish to voice my deep conviction that it should be a real valuation, based upon a marshalling of facts and data which may be used for any purpose in the future. This is my individual view, based upon a long experience in valuing railroad property for purchase or leasing. Railroad properties are constantly being valued, and are being bought, sold and leased on such valuations, and have been, frequently, for the last 60 years. It has been possible to do this without encountering the tremendous expense, complications, difficulties and grave differences that are being experienced in the federal valuation; and it will be possible to do so again. I believe that today we can have a real governmental valuation of our railroads, and one that will be of real utility, just as soon as we make up our minds that practical considerations, and not theory, shall govern the procedure.

We, therefore, ask you, as part of your public duty, to take an earnest and active interest in this matter. Do not content yourselves with merely combating the railroads' arguments, where you think them vulnerable or in error. This is a place for constructive work, in which you can perform a service of value by aiding in bringing this vexed and difficult problem to a just and satisfactory solution.

PROTECT THE CREDIT AND EFFICIENCY OF THE RAILROADS

To return to my starting point, we ask your aid and co-operation in these matters: Simplification of accounting, elimination of unnecessary reports, prompt according of reasonable rates, legalizing pooling of traffic under proper public supervision, encouragement of mergers to promote efficiency, relief from obsolete restrictions of state statutes and the Sherman law, and obtaining real valuation of the railroads. Your influence in all these matters is potent.

The government cannot move, in this great struggle, without the effective aid of the railroad system. Therefore, let us, through co-operation, make it a real and vital force, and a mighty arm of the Nation in achieving success in our battles, our commerce and our National ideals. Carefully consider the narrow margin of earnings allowed to the railroads, under public regulation, since 1907, upon the huge investment placed at the disposal of the public. I think you will then realize why it has been, and is now, impossible to provide the requisite capital to furnish adequate terminal facilities, and take full advantage of electrification and improved appliances in equipment and operation to keep the railroads well in advance of the growth of traffic. . . . We have given a sign to all the world that this democracy has dedicated its men, its honor and its private and corporate wealth to the nation, so that it may be in the first rank to fight for the world's freedom. . . . In this great work it is an honor for us all to share, realizing that transportation, and especially railroad transportation, is a national service and in the highest degree essential to national prosperity in times of war or peace.

LOCOMOTIVE DESIGN FROM A MAINTENANCE STANDPOINT*

By W. H. Winterrowd

Assistant to Chief Mechanical Engineer, Canadian Pacific

The type and size of a locomotive have an important bearing on certain details of design. A discussion of the factors relating to the selection of the desired type and size is far beyond the scope of this paper as it would involve a thorough consideration of the economics of railway operation.

Occasionally some detail of the resulting design, while undesirable from a maintenance standpoint, is unavoidable. However, the majority of locomotive details are free from other than purely local restrictions and may be designed almost entirely from a maintenance standpoint.

It should not be inferred from what follows that mechanical and operating men, as well as locomotive builders, have not given a great deal of consideration to the points mentioned. Very many locomotives in service today bear witness of such consideration. However, there are at present justifiable reasons for emphasizing and reviewing the importance of locomotive design from a maintenance standpoint.

To-day, under changed conditions, the railroads are being called upon to render greater service than ever before. But little new equipment is available other than that which the railroads may build in their own shops. Repair shops are being worked to capacity. Skilled railway mechanics are scarce. Material of all kinds is difficult to obtain. All of which means that maximum service must be obtained from every bit of existing equipment. It is, therefore, essential to consider every legitimate means whereby the "out of service period" of a locomotive may be decreased and the "in service period" increased.

All new locomotives should be constructed to give maximum service with minimum maintenance. All locomotives being rebuilt, or modernized, should be turned out of the shops prepared to give similar results. Any improvement that can be made to any locomotive, new, modernized, or under repairs, which will result in increased service, increased efficiency, or decreased maintenance, will help to increase the capacity of the railroads.

The following covers briefly a few of the points worthy of consideration:

BOILER

It seems hardly necessary to state that a well designed boiler of ample capacity is easier and cheaper to maintain than one of smaller capacity and which has to be forced continually. The importance of ample capacity can scarcely be over-emphasized, either from a maintenance or operating standpoint. Within its limits of weight and size a boiler should be designed to have a capacity as large as possible consistent with other governing factors. In this connection the values of the superheater, the brick arch, and the feed water heater are unquestionable. These values have been practically demonstrated from the standpoint of economy as well as locomotive capacity.

The maintenance of locomotive boilers is an important factor, the greatest difficulties being leaky flues, leaky mud rings, broken staybolts and cracks in firebox sheets.

Knowing that firebox heating surface does a great deal more work per square foot than the flue heating surface, boiler capacity does not depend upon long flues. Short flues are the easiest to maintain.

The radii of door and back head sheet flanges should be studied in relation to the staybolt stresses. Too small a door opening radius will frequently result in cracking of the sheet at this point because of insufficient provision for expansion.

Mud ring corners of ample radius will be easy to construct

*From a paper before the Canadian Railway Club.

and maintain. Trouble due to small radius has, in many instances, been overcome by electric or acetylene welding the bottom edges of the sheets at this point to the mud ring.

Flexible staybolts reduce staybolt breakage. A careful investigation will indicate the zones of maximum staybolt stress and sheet movement. In these zones the flexible bolts will give good results and reduce staybolt renewals.

In connection with the barrel of the boiler, points which may be mentioned are—throttle and dome arrangement which will permit interior inspection of the boiler without the removal of the standpipe; also the elimination, as far as possible, of all small studs. The latter will apply equally to all parts of the boiler under pressure.

Expansion slides, instead of an expansion sheet, under the front of the mud ring, will eliminate the maintenance of a considerable number of bolts and rivets. Proper consideration of all other expansion sheets will further reduce maintenance of many bolts and rivets and tend to eliminate the many resulting troubles as well.

FRAMES

Frames should be of ample cross section and well braced to hold them rigid. Maximum cross section may be of little avail unless accompanied by sufficient and properly located bracing. In this connection, it hardly seems necessary to mention the advantages of a valve gear located outside the frames. The outside gear has made possible better frame bracing, to say nothing of the advantages of easier inspection and maintenance of the gear itself.

Where cylinder design will permit, a one piece frame with a top tie splice seems desirable. Where large cylinders prevent the above arrangement, a one-piece frame with ample depth under the cylinders, and having no reduction in thickness, will give excellent service.

MOTION WORK

All bearing pressures should be as low as consistent with good practice in order to reduce wear and resultant replacement. Ample pin length is desirable in order to obtain lateral stability. Arrangement of motion and design of back steam chest and back cylinders covers should be such that both valve stem and piston rod packing will be easily accessible.

Valves of light weight will reduce the load on all valve parts and result in reduced maintenance.

Selection of high grade, close grained, cast iron for cylinder and valve bushings, piston heads and rings, and in some cases rod bushes, is more than warranted in view of the increased mileage obtainable and the corresponding decrease in maintenance.

If conditions permit the consideration of heat treated, or alloy steels, the unbalanced forces may be very materially reduced by the use of light reciprocating parts. The reduction of such forces will in turn tend to reduce the maintenance of pins, bushings, etc.

EQUALIZATION

Locomotives should be equalized so as to secure the most efficient guiding power from both leading and trailer trucks, or wheels. This involves the proper distribution of weight and a means of keeping the proper weights on the various axles at all times.

In general, the best results seem to be obtained by dividing the equalizing system so that the division between the front and back systems is as directly under the centre of gravity of the locomotive as the wheel base and other conditions will permit.

The spring gear and equalizing system should receive particular attention when being erected and also when being repaired. The tops of the driving boxes should be milled out squarely and in a plane parallel with the journal bearings. The equalizer and saddles should be fitted to their seats squarely with the pin holes so that the engine will ride

squarely on her springs and track properly. The same will apply to the trailer truck equalizers and spring rigging. Trailer trucks that do not carry the back of the engine level are responsible for much avoidable tire wear.

SPRING AND BRAKE RIGGING

A driver brake main fulcrum shaft in two pieces of equal length, the outer ends supported in bushed bearings integral with the main frames and the central portion supported by a sleeve, will give more even distribution of braking power and maximum accessibility for repairs and adjustments.

Brake cylinders, if at all possible, should be located vertically, in order to reduce packing wear and provide accessibility.

Brake shoe heads and hangers should be so constructed and hung that shoes will swing clear of the wheels when the air pressure is released and permit an easy application of new shoes.

The ratio of brake cylinder to brake shoe pressure should be kept as low as consistent, and should not exceed commonly accepted ratios. This will insure that false travel will be kept to a minimum.

PIPING

The importance of ample clamping and provision for expansion cannot be overemphasized. Piping should be as short as possible consistent with conditions. Accessibility is of prime importance. Piping should be so located that there is no obstruction of washout plugs, arch tube covers, pads, etc. Where pipes pass through the front of the cab, provision should be made for clearance or for sleeve protection to prevent wearing or cutting.

The Canadian Pacific has found it a decided maintenance economy to place lubricator piping from cab to cylinders, etc., in a slightly larger wrought iron pipe where the feeds pass beneath the jacket and lagging. By this means the feed pipes can be removed or applied without the necessity of removing any outside covering.

MISCELLANEOUS

Removable liners on engine and tender truck pedestals make it easy to take up wear and reduce pedestal renewals. To prevent rapid wear between the wheel hub liner face and the driving box sufficient provision for lubrication should be made.

All oiling points should be made as accessible as possible. Handholds or small steps, properly located, to make some oiling points accessible, will soon pay for themselves.

Boiler jacketing should be applied in sections so that panels can be removed with a minimum of labor.

The foregoing are but a few of the multitudinous details which merit most careful thought. But little mention has been made of the possibilities of simplified design by the use of cast steel. It is felt that with the development of the cast steel industry and the production of castings which are practically equivalent to wrought iron that locomotive construction in the future may be greatly simplified. We are today using casting that ten years ago would have been deemed impossible to successfully cast. For example, one piece locomotive frames are now under consideration and will soon be in experimental service. These consist of the two main frames and all cross braces cast in one piece. This in an indication of the degree of simplification that may be obtained. The maintenance of such parts has in turn been made possible by the development of the art of electric and acetylene welding.

In conclusion, simplicity co-related with efficiency should be one of the keynotes of locomotive design. This principle, which in other words is simply good judgment, will make for that degree of efficiency which will be reflected, not only in reduced maintenance costs, but also in the increased capacity of the locomotive plant as a whole.

Farmer and Railroad as Partners in Industry*

They Are Mutually Dependent for Success, Yet the
Farmer Causes Railway Regulation That is Harmful

By W. B. Storey

Vice-President, Atchison, Topeka & Santa Fe Railway

THE railroad, from an agricultural point of view, has in the past been an intangible something to be greatly desired until obtained and then something to be blamed for every manner of ill-luck, to be kicked and cuffed about when there was nothing else to abuse, to be taxed more heavily when revenues were short and, in general, to be made the scapegoat of the community. The farmer has not been able to recognize any community of interest with the railroad. He seems to regard it as an organization having an unlimited command of capital that can do anything by willing it and as generally opposed to everything the farmer wants. Most of the farmers in this state came here after the railroads were here. They accepted them as one of the gifts of nature; soil, water, sunshine and the railroad were at hand and all that was needed was to take advantage of these gifts and by the proper combination begin to make money. The railroad was a very convenient element of this combination because if any of the first three elements failed, the results of the failure could be rectified by taking it out of the fourth, the railroad being the only part of the combination that could be regulated. Today there is hardly anything that happens that is not charged directly or indirectly to the railroad. This feeling is carried so far that every act of the railroad, whether of omission or commission is ascribed to malicious intent on the part of the officers of the road.

If a carload of fruit is delayed by a washout it is a deliberate act on the part of the corporation. If a claim is not promptly paid it is an effort to escape just responsibility. If an employee is impolite it is the act of the management, the fact being overlooked that the employees of the railroad are generally taken from among the people whom they serve. The sole impression, therefore, of the average farmer about the railroad is that it charges very high rates, that it gives very poor service and that it pays its taxes grudgingly.

When the earliest railroads were built no one dreamed of the tremendous stride that was being taken. Those were constructed with the idea of making somewhat easier the limited interchange which then existed but the actual opening up of the land in the manner which has occurred was not foreseen. As illustrating this I would point out that when the first transcontinental railroad was built to California one strong argument that was used to sell the securities was the enormous commerce that would be built up with China and the Orient and very little was said about the business to be developed along the line. There was practically none at that time and few could see the possibilities of the future. Abraham Lincoln, when appearing as attorney for the first railroad to cross the Mississippi, in its application for permission to build the bridge, caused a smile to pass over the room when he suggested that the time might come, in the distant future to be sure, when as much freight might cross the river as then passed up and down the stream. Today that one railroad carries daily across the river more freight than ever passed up and down the stream in a month. In those days it was thought the railroads might bring products to the rivers, but that they could actually supplant the rivers was unbelievable.

HOW RAILROADS DEVELOPED AGRICULTURE

During all this early period there was but little agriculture in its present sense. At once, however, on the construction of railroads, agriculture came into its own; the products of the west could reach the east and even by combining with sea transportation could go to Europe. The land began to produce and immediately came a demand for the land and settlers poured into the newly opened country. The lands adjacent to a railroad were at once settled and then the country beyond the railroads and this, in turn, called for more railroads. The country, as a whole, came to recognize the absolute necessity for transportation and local and government aid was given to induce railroads to build; and capital, not recognizing some of the facts that it has since learned, poured its resources into the construction of new roads. In this manner came development of the country, and to make you realize how rapidly this development came I would point to the fact that the entire railroad mileage of the United States has been built in eighty-seven years and every mile of railroad between Chicago and the Pacific Coast has been built in my lifetime. Coincident with that period has come the entire agricultural development of the west.

But the rapidity of growth brought changes in economic conditions. Railroads were built faster than the country could absorb them; i. e., the country was ready for development, but there were not enough people to develop it, the supply of farmers wanting cheap land having been exhausted. The railroads thus found themselves with miles of rails but with no business. Thus it was discovered that people meant products and products meant business; and immediately followed the effort to induce people to come to the west and finally came the establishment of colonization agents in Europe. Through this means large sections of the country were settled and thousands and thousands of foreigners came to this country. The railroads, therefore, really helped populate the country, and even today this same process is going on, not perhaps by bringing people from Europe, but by bringing people from the more thickly settled portions of the country to that which has been just opened up.

It might be mentioned here incidentally that this rapid development brought in its train many mistakes and not only did financial wreck come to many railroads but to many farmers. The latter were not acquainted with the limitations of the soil and climate and, as in every new country, many were unsuccessful and whole sections of states that were once settled became waste land again. The railroads, however, that had been built to serve such sections could not move out as had the settlers and they were compelled to remain and go through all the vicissitudes of bankruptcy. This, in turn, gave opportunity for people to charge that railroads were improperly managed or purposely wrecked, when, as a matter of fact, they were following only natural laws; one of which is that if there is no business a railroad cannot exist. But this unproductiveness of the country led to efforts on the part of the railroads to make it productive. Consequently there are today all over the country, in the service of the railroads, expert agriculturists, whose function it is to make two blades of grass grow where one grew before. In the east the railroads are trying to rehabilitate that country of deserted farms. In the semi-arid west the railroads

*From an address delivered at Berkeley, Cal., on October 13, on the occasion of the dedication of Hilgard Hall, the new agricultural building of the University of California.

are teaching the farmer the kind of crops to which the soil and climate are adapted and the methods of farming that will produce the best results.

You will thus see that co-incident with the settlement of the country came the raising of crops and produce that demanded and required the railroads and the construction of railroads required the raising of crops; and the two interests, agriculture and transportation, became so closely interwoven that they are now absolutely inseparable.

California early turned its attention to wheat which was raised in the valleys and brought down to the seaboard for shipment abroad. Other than this there was little that California produced agriculturally that could bring capital into the state and even wheat brought such low returns, on account of the distances that it had to be carried to reach a market, that the rewards were meagre. The fruit raised in California for local consumption was of excellent quality but with no market there could not be much growth in the industry. The railroads at the same time traversed the continent and had practically nothing to haul eastward. They could not haul the wheat to the eastern markets because the vast wheat fields of Kansas and the Mississippi Valley were so much nearer the market that they could always undersell the California product. From the double need, therefore, on the part of the farmer for something that would make larger returns and on the part of the railroads for business, came the gradual development of the fruit industry. The original attempt to carry fruit east was made by express train, a car being shipped occasionally, sometimes with bad results but sometimes with profit. After this came refrigeration which permitted a longer period enroute and transportation in freight trains, with the accompanying lower costs which, in turn, meant greater profits; and finally came the business as it is developed today. A great industry on which the prosperity of a state depends has been produced by the farmer and the railroads acting together.

THE RAILROAD AND FARMER AS PARTNERS

The farmer provides the land, selects the best varieties of trees, furnishes water, cultivates the soil, gathers the fruit and through his packing associations cleans, boxes and loads it, while the railroad provides proper kind of cars, has them on hand when wanted, moves the cars immediately they are loaded, ices them at proper points along the road, keeps them moving and delivers to some point two thousand to three thousand miles away at a scheduled time. If there is failure in any one item either on the part of the farmer or the railroad, the entire product of all the labor is lost. All California has thus been developed with this absolute dependence of the farmer on the railroad and yet I doubt if there has ever been any realization of the fact that the two are one; that they are partners that cannot dissolve partnership, that what helps the farmer helps the railroad, what helps the railroad helps the farmer and that one cannot exist without the other.

Let us consider first the organization of a railroad. Is it a reservoir of money that will give forth its contents by edict of law? Is it capable of creating something from nothing? Is it the enemy of all? Is it a combination of Wall Street capitalists who are bent only on extracting from the country everything that can be taken? It is, in fact, none of these things. It is an aggregation of ordinary people, such as you and I, who join their interests to manufacture transportation. These people are shareholders and each one pays into the concern a certain sum of money; the contributions varying from \$100 upward. As illustrating such an organization I might mention the Santa Fe Railroad. On June 30 of this year there were about 44,000 shareholders, and the holdings averaged about 78 shares each, there being many holdings of less than ten shares. These people elect from among their number directors, and

the directors—certain officers to manage the affairs of the business. These officers, who are also just ordinary people, such as you and I, proceed to build certain lines of railroad with the money that has been paid in by the shareholders and to carry over those railroads, for hire, freight and passengers. As the business develops, more miles of railroad are built, possibly with money from the sale of additional stock or perhaps with borrowed money, and the business expands just as in the case of any other business that is furnishing something for which there is a growing demand. If the earnings are enough to give a profit over and above the cost of the article they are manufacturing, the shareholders are the ones entitled to the dividends and if there is a loss they either meet the loss by paying an assessment or they lose their property to the people from whom they have borrowed money. Railroads, therefore, are organized and built to manufacture transportation for profit just as the orchard is planted and developed with the idea of profit. And just as profits in farming induce more investment in farming, so profits in railroading induce more people to invest in railroads. The reverse also holds and unless a railroad pays, people will not invest in it and its credit is destroyed.

RAILROAD MUST PROSPER IF FARMER IS TO SUCCEED

This brings us to a proposition that may sound strange; viz., that it is essential for the success of the farmer that the railroad should prosper. You may ask why, after the railroad is built, is the farmer interested in whether it pays or not? It is compelled by law to run and the farmer is not interested in the shareholder. If the unfortunate man made a mistake in investing in such a concern that is his fault. Let us, however, look into this farther before deciding hastily. In the first place the railroad, like any other business, must grow and keep up with the growth of the country. A line of rails may connect San Francisco and New York, but that is not a real railroad. The latter needs locomotives, cars, sidings, roundhouses, second track, stations, and as the business of a railroad expands, more cars, more locomotives to pull the cars, more side tracks to pass trains, more machine shops to repair engines, larger water and coal stations, and, in fact, more of everything that forms part of a railroad. It is due to lack of these that trains are delayed, that car shortages occur, that freight congestions arise, that embargoes on freight are placed. In order to keep up with the growth of the country, the Santa Fe railroad should spend in additional facilities, such as I have named, at least twenty millions a year, and it should be able to obtain that amount of new money either by stock subscriptions or by borrowing. To do this its credit must be absolutely sound; i. e., investors must be sure of getting returns on their investment. Now, does it come home to you why the farmer is interested in the shareholder? Possibly the whole problem can be better understood by a study of the last five years. For a long period prior to the beginning of the war and for some months afterwards, business in this country was at an extremely low ebb. The railroads suffered with the balance of the country, even more so because, due to commissions and legislatures, their conditions had become more seriously hampered than other lines of business. As a result many roads went into the hands of receivers and others only avoided this by the most careful business methods. The direct consequence was that investors became shy and either refused to invest at all or only when high rates of interest were offered. The railroads, therefore, could not add to their facilities. Then came the business boom and with it the cry that the railroads were not taking care of the business of the country. All the facilities I have named were lacking in sufficient quantity to take care of the business offered and the best efforts of the entire railroad world were unable to meet

the demand. And even today the business of the country is keeping ahead of the railroads. They are struggling to catch up but it is very hard to do so. It is to the vital interest of the farmer that the railroads should keep up with the progress and growth of the country and, therefore, he is interested and deeply interested in the solvency and prosperity of the railroad.

We are now in a position to consider what makes for prosperity in a railroad. The answer is, ample business at proper rates. This brings us at once to the great big point of difference in the past between the farmer and the railroad; viz., rates. This is the rock on which we have split. This is what has led to the misunderstandings, the laws against railroads, the unjust regulation of railroads and to many, if not most of the troubles, that are afflicting railroads today, and, while they have continued to exist under the lower and lower rates, and the more oppressive regulations and the higher taxes, this does not prove that this course of treatment is the best for the railroad or the best for the farmer. I need not cite the fable of the man who was succeeding so well in teaching his horse to eat green colored shavings. On the other hand, the lower and lower rates have made it harder and harder for the railroads to live. They have felt compelled to resist each and every attempt to cut the rates. If rates could follow prices up and down, perhaps at times they could afford to lower rates temporarily, but you may possibly remember the lemon case. When the duty was removed on lemons and the Sicily lemon came to this country at such a price that the California lemon could not compete, a request was made for a lower rate so as to enable the industry to keep alive. This was given. Later the duty was restored and the railroads attempted to go back to the earlier rate, but the effort was resisted and lemons have been hauled ever since at a rate fixed to help out the farmer. The railroads have, therefore, pushed back whenever the suggestion of lower rates is made. This constant struggle has had the effect of making the rate question apparently the irreconcilable conflict; the railroads insisting that they must have higher rates or starve and the farmer just as strongly believing that unless there are lower rates he will starve.

IMPORTANCE OF LARGE TONNAGE TO A RAILROAD

Let us, however, drop the rate question for a moment and look at the other element in prosperity for railroads; viz., ample business. Have you ever heard the yord tonnage? It may be a new one, but in the railroad world it is an important one. Tonnage multiplied by rates gives revenue. Give a railroad all the tonnage it can haul and you may cut the rates instead of raising them and still the railroad will be prosperous. Why are the average rates per ton mile east of Chicago about half of those west? Because the roads in the east have tonnage. Why are the earnings of the western roads showing an increase this past year in spite of the higher cost of everything? Because there has been a heavy increase in tonnage. By increasing the tonnage loaded in cars the item of car and of car repairs per ton hauled is cut down; by increasing the tonnage in trains the element of wages, coal and engine service per ton hauled is decreased and by increasing the number of trains the cost of track maintenance, of administration and of interest charges per ton hauled is decreased. Therefore, tonnage is the great desideratum of the railroad; heavier loaded cars, heavier loaded trains and more trains. As a consequence, to the railroads, tonnage is, in reality, more important than rates.

Now let us look at the farmer's side of the controversy. There are two things that the farmer needs to make his part of the common undertaking a success; viz., low rates and good service. While the farmer, yes, and the entire country, has been keeping watch over rates, the matter of service is the real necessity; quick service and prompt service, sure

service and reliable service. Of what use is a low rate if your products cannot get to market on time or in proper condition? The service given is all important and should be carefully weighed when you are doing your regulating, for you have in your own hands, through your commissions, the final decision in the matter of rates.

Having seen that there are other things besides low rates that the farmer needs and other factors than high rates that the railroad needs, we are in a position to study rates more calmly. The matter is, of course, an important one and if a railroad cannot get tonnage it must have rates. Let us start out by saying that the rate should be a fair one. You smile and ask, but what is a fair rate? The answer is simpler than you think; it is one that will produce the maximum of business. A rate that allows business to develop steadily and constantly is a fair rate. On such a basis as this a rate might be and often is made so low that if applied to all the business of the road it would cause bankruptcy, and, on the other hand, it may be so high as to give a handsome profit to the railroad over and above all expenses and interest charges. It was the misconception of this principle that gave rise to the belief that railroads charged all the traffic would bear. That the rates for the farmer in this state have not been too high in the past is shown by the remarkable development of agriculture in this state. The railroad will carry an orange three thousand miles for you for about half a cent, it will take a lemon for one-fifth of a cent, a pound of potatoes or a pound of beans for three-quarters of a cent or a pound of dried fruit for a cent. Are these rates excessive when you think of the service performed? In no country in the world are freight rates as low as in the United States. The railroad rate today has no real influence on your profits. Different conditions in different years give you a good year or a bad year. If Florida has a large crop of oranges and it comes to market at the same time as yours, your returns will be low; if you yourselves overstock the market the price will be low and your profits small, but these are not reasons for lower rates. The fact that your orchard interests have developed and are continually developing is all the reason that is necessary to show that the rates have been low enough. Let us, therefore, stop contending over the rate question and let us give our attention to the increase in tonnage and to better service. You will be surprised to find how small the rate matter will seem.

HARMFUL REGULATION OF RAILROADS

Having now discussed the great big point of difference let us glance at some of the troubles other than low rate that affect the prosperity of the railroads. In order to control the rates you have formed commissions and the railroads are thus the subject of regulation. This should be a help rather than a trouble if properly handled, but they are, as a matter of fact, over-regulated. There is regulation by the state commission; there is regulation by other state commissions; there is regulation by the Interstate Commerce Commission; there is regulation by the Health Commission; there is regulation by the highway commissions; regulation everywhere, and then when the different commissions have reached the limit of their consciences the legislatures take a hand. Have you ever heard of the full crew law where the legislature has declared in the interest of public safety how many brakemen shall be provided for trains? Can anyone show why a train in Illinois can be operated safely with two brakemen and the same train in California must have three? This simple little California law costs the Santa Fe alone \$50,000 a year. Have you ever heard of the train length law? Possibly not, but in a neighboring state they limit the number of cars that may be handled in a train. Can anyone show why the public safety of Arizona is benefited by limiting the length of trains to seventy-five cars.

whereas in practically every other state it is permitted to haul all of the cars the locomotive will pull? It is not regulation to which there is objection, it is fool regulation, it is conflicting regulation. Do you know that the Santa Fe railroad has to deal with thirteen state commissions and in addition with the Interstate Commerce Commission and the regulations of the various commissions differ from each other and also in some cases with those of the Interstate Commerce Commission?

And now you have afflicted the railroads with valuation. The state of California valued them and not only has the state spent a large amount on the work but so have the railroads. As this work was approaching completion the United States began to value them and they have been doing the entire thing over. The cost to the Santa Fe railroad, of the Interstate Commerce Commission valuation alone, is estimated to be over one million dollars and I assume as much more to the government. This might be justified if anyone could point out the advantage either to the railroad or the state. I claim that the valuation law has been enacted under a misconception. There seems to have grown up in this country the thought that the railroads should only be allowed to earn six per cent or less on their cost and that anything they earn over this is stolen from the public. This is an absolutely wrong idea. It has been necessary in the past to resist, in the courts, rate reductions and the only way this could be done was by showing confiscation; which necessitated showing that the given rates did not allow 6 per cent on the value of the railroad. But nowhere has it been decreed that 6 per cent must be the limit of the earnings. If this should be fixed as a limit there would be no surplus in the good years to help out the bad years and the average would be so low as to stop all investment. As a matter of fact, rates should not be and are not fixed on the basis of the cost of the property but should depend on the principle mentioned above; viz., that which will develop the maximum business.

RAILROADS MORE IMPORTANT THAN WATERWAYS

We felt, at first, that no matter what rates were charged we could stand them if we could only get the railroads. We then reached the conclusion that the rates were too high and that unlimited competition was needed to control this feature, and gave aid and encouragement to every railroad that asked for it. This led to the competition we desired, but other evils at once manifested themselves, such as lower rates to larger shippers. We finally stopped the discrimination by requiring that all rates be published, but we also absolutely stopped competition in rates; for what road would name a lower rate when its rival would at once meet it, leaving as the only effect of the lowered rate less income for both? We then turned to competition by water. We gave government aid to waterways and we are today pouring yearly into our waterways millions and millions of useless expenditures. You, in California, urged the Panama Canal. I know that from a railroad man a statement that money spent in waterways, yes in the Panama Canal, is economically a mistake will not carry much weight, just at present, but I make the assertion boldly and will trust to time to convince you. Have you ever realized that the charges for water service would be higher than those on the railroad if they were based on the actual cost of the improvements or that, on the other hand, the rates on the railroads could be less than they are on the water if the entire interest and maintenance of the railroads should be absorbed by the government? Have you ever realized that the railroads employ more men than can possibly be employed by water routes and that the number of people employed in your midst is a direct element in the prosperity of a country? Have you ever considered that the fostering of waterways turns from the railroad the tonnage which is the

one absolute requirement to enable low rates and that you thus deprive them of the power to give the service that is necessary for the best development of agriculture? All these things should be taken into account, and have been too little considered in the past in the making of our laws and in our feelings toward the railroad problem.

You can thus see how we, in this country, are floundering. In the teachings that will go forth from this temple which we are dedicating today let it be shown that the railroad is the twin brother of agriculture, that in considering what is best for one we must consider the interest of the other, that regulation does not mean strangulation; that unlimited competition may become destructive competition and that a low freight rate is not the panacea for all the troubles of the farmer.

"SAILING DAYS" FOR L.C.L. FREIGHT

Shortly before July 1 the Pennsylvania Railroad announced a plan for the installation of "sailing days" in the handling of l. c. l. freight and the designation of particular stations at which freight will be received exclusively for specified destinations. The purpose of this plan was the elimination of delays incident to the rehandling of freight when consolidating small shipments into full carloads at transfer stations; the conservation of the car supply by securing better average loading; the reduction in the number of car and train movements required to transfer the given quantity of freight, and improvement in the regularity of this service by systematizing and simplifying operations.

This plan was placed in operation in Philadelphia on September 1, and in Baltimore on October 1. It will also be introduced at New York, Buffalo and Pittsburgh in a few weeks and it is expected that it will be adopted ultimately at all of the important freight shipping centers on the Pennsylvania Railroad. Previous to the inauguration of this plan at Philadelphia and Baltimore, "shipping day guides" were printed and distributed among the shippers and freight organizations in these districts. These guides gave complete information concerning the days on which freight will be accepted at the various freight stations for points in all parts of the country and the closing hours at each station for the various destination points.

The cities have been divided into zones and days have been designated on which each station in the city will receive freight for different points. Closing hours have been fixed at different points throughout the afternoon to relieve the congestion of teams and to increase the capacity of the stations.

In the 10 days from September 4 to 13 inclusive the average loading of l. c. l. cars leaving Philadelphia was increased nearly 34 per cent. On this basis it is estimated that when this new system is in full operation all over the road it will save 1,000 cars a day on the lines east of Pittsburgh and Erie in the transportation of less-than-car-load freight. Since the installation of this system many letters expressing commendation have been received from large shippers, indicating that the plan is meeting with the approval of the patrons of the road.

The benefits of this plan are not confined to the individual road but are also reflected on its connections. For instance, the New York, New Haven & Hartford has announced the installation of a similar practice at a number of its stations.

A large amount of l. c. l. freight originates in New England destined for points south and west of New York and over 100 cars of it are handled through the Pennsylvania transfer station at Waverly, N. J., daily. The consolidation of these shipments at the points of origin on the New Haven will do much to facilitate the operation at Waverly transfer which is now badly congested.

EDWARD L. BROWN

Edward L. Brown, who has been elected president of the Denver & Rio Grande, has had an extremely wide experience in railway work. He has a remarkably level head even for a railroad executive and it was this qualification above all others that recommended him to the board of directors. The Denver & Rio Grande is in a rather unsettled condition. Various factors which are contending for the control of the Missouri Pacific, which is now under the domination of Kuhn, Loeb & Co., have a large investment in it, as has also the Gould estate. It was therefore necessary to select a man as president who not only knew how to operate the railroad—and the Denver & Rio Grande, even if its financial affairs were satisfactorily straightened out, is a hard proposition to operate under present conditions—but its president must also be able to shut out from consideration internal and external difficulties and devote himself body and soul to running the railroad along scientific lines.

Mr. Brown is an indefatigable worker and of such a disposition that he can turn from the most annoying problems to some entirely different subject with apparently a perfectly clear outlook. He is entirely fearless and his weakness as well as his pastime consists of work. He is capable of carrying an immense amount of detail in his head and yet this never seems to obscure the broader outlook of his work or the work of his subordinates. He is a man of kindly disposition and on intimate terms with his employees. Mr. Brown, when he was vice-president of the Denver & Rio Grande several years ago, was in general charge of the reconstruction of the Soldier Summit (Utah) section of the line. This is the most important improvement that the Denver & Rio Grande has undertaken in recent years and the replacement of the 4 per cent line with 15 miles of 2 per cent line removed the point of most serious congestion. This work was described in the *Railway Age Gazette* of November 28, 1913, page 1013.

Mr. Brown was born in Iowa in 1864. His first experience in railroad work was with the Chicago, Rock Island & Pacific in 1875 as a messenger boy. From 1887 to 1890 he was consecutively telegraph operator, station agent and train despatcher on this road. In 1883 he was appointed joint agent of the Chicago, Rock Island & Pacific, the Wabash and the Iowa Central, in which capacity he served until 1888. From this time to April, 1891, he was general agent of the St. Paul & Duluth, with office at West Superior, Wis., and from April, 1891, to November, 1891, was commercial agent on that same road, with headquarters at St. Paul, Minn. In November and December of 1891 he was chief despatcher and superintendent of telegraph, and from December, 1891, to March, 1896, he was master of transportation on this road, being promoted to superintendent in March, 1896, and retaining this position until June, 1900. From June 15, 1900,

to February 1, 1902, he was superintendent of the Lake Superior division of the Northern Pacific, with office at Duluth, Minn., and from February, 1902, to April, 1903, was general superintendent of the Montana Central. In April, 1903, he was appointed general superintendent of the Eastern district of the Great Northern, and held this position until March, 1907, when he became general superintendent of the same district with headquarters at St. Paul, Minn. From October, 1907, to February, 1912, he was general superintendent of the Western district of the Great Northern, having his headquarters at Seattle and Tacoma, Wash. From February, 1912, to July, 1913, he was vice-president of the Denver & Rio Grande at Denver, Colo. In July, 1913, he was elected vice-president of the Western Pacific also, and transferred his headquarters to San Francisco, Cal. He was elected to the presidency of the Minneapolis & St. Louis in September, 1916, but was forced to give up this position in March, 1917, because of ill health, which later necessitated an operation at Rochester, Minn.



E. L. Brown

INCREASED RATE PROCEDURE

The Interstate Commerce Commission's proposed tentative order outlining a method of procedure under the amendment to the commerce law that requires railroads to secure the approval of the commission before they may file a tariff containing an increased charge is in the main satisfactory to the railroads. This was stated by representatives of the roads in various territories, at the hearing called by the commission at Washington on Monday to consider the proposed order. Representatives of the shippers, who were present in large numbers, appeared desirous of having some plan which would give them complete notice of the carriers' applications in time to protest, but were not agreed as to how such a plan could be carried

out in practice and expressed no particular opposition to the order. The opinion was expressed on both sides that the plan should result in bringing about a greater degree of co-operation between the carriers and the shippers through conferences before tariffs are prepared and that it will probably result in many rate controversies being threshed out before tariffs are filed instead of afterward.

It was brought out during the hearing that approximately 1,100 applications for permission to file tariffs are now pending before the commission.

G. M. Freer, president of the National Industrial Traffic League, said the shippers were especially interested in securing detailed notice of the applications before they are acted upon and said he had received a suggestion that applications be put on file at places where the roads are now required to keep a complete file of tariffs. Luther M. Walter suggested that either the commission or the carriers pay for publishing lists of applications in a trade paper or papers. R. D. Rynder, speaking for a number of Chicago attorneys practicing before the commission, suggested that applications be

kept on file for 30 days, but that this should not apply to merely perfunctory tariffs intended to correct errors, etc., which should be allowed to become effective at once. He thought the plan of sending notice of applications to shippers' organizations would prove inadequate. S. H. Cowan expressed the opinion that the commission should not attempt to decide as to the reasonableness of rates before approving them for filing. A. E. Helm, of the Kansas Commission, thought that the commission should have a large measure of discretion as to handling applications; that as to many it could dispose of them informally and without publicity and as to the others it should give general notice and hold hearings.

On behalf of the southern carriers, R. Walton Moore said that the tentative plan should be given a trial and that the commission should not attempt to restrict its practice by too many rigid rules. Because a large majority of the applications would be of minor importance, the commission should not attempt to fix a definite period before they could be acted upon and a plan of widespread publicity would be unnecessary.

J. C. Lincoln, of the Merchants' Association of New York, thought a plan could be arranged by which the carriers could notify interested shippers.

F. H. Wood, representing the western lines, said the matter should be left to the broadest discretion of the commission. Otherwise, he said, the law would prove unworkable, but he thought that great good might result from it if it can be made workable, by offering an opportunity for a freer discussion with shippers about proposed advances before they are put in tariff form. He thought one result would be to do away very largely with the suspension docket.

The commission has announced that its board heretofore known as the Investigation and Suspension Board will hereafter be known as the Fifteenth Section Board and in addition to its previous duties will in future receive for the commission all applications of carriers under the amended fifteenth section for permission to file tariffs carrying increased rates, fares or charges.

THE MAINTENANCE PAINTERS' CONVENTION

The fourteenth annual convention of the Maintenance of Way Master Painters' Association of the United States and Canada was held at the Hollenden Hotel, Cleveland, Ohio, on October 16 to 18 inclusive. The officers of this organization for the past year were: President, F. C. Rieboldt, master painter, Chicago, Milwaukee & St. Paul, Milwaukee, Wis.; first vice-president, H. E. Conrad, master painter, Pennsylvania Railroad, Huntington, Pa.; second vice-president, A. E. Wilson, master painter, New York, New Haven & Hartford, Hartford, Conn.; secretary-treasurer, F. W. Hager, master painter, Fort Worth & Denver, Fort Worth, Texas.

The convention was called to order by President Rieboldt with an attendance of about 40 members and guests. After prayer by Rev. John S. Rutledge, an address of welcome was made by Harry L. Davis, mayor of Cleveland, who spoke on the efforts being made by the people of the city to insure the success of the second Liberty Loan. Mr. Rieboldt, in his address, called particular attention to the steps taken by the American Railway Association which are designed to bring about the eventual co-ordination of the work of the various voluntary railway organizations, the plan being to designate the American Railway Engineering Association at the primary body to exercise proper supervision and discipline over the others. He urged a consideration of the matter by the convention. The secretary's report showed a membership of 75, there being no appreciable change during the past year.

A paper by C. F. Loweth, chief engineer, Chicago, Milwaukee & St. Paul, which, owing to his absence, was read

for him, and entitled "Painters and Painters," presented a rather broad aspect of the painter and his relation to life and his work.

C. H. Hall, general superintendent, Patton Paint Company, Milwaukee, read a paper on the "Painting of Interior Walls." In this he discussed the use of white lead, zinc oxide and lithophone composed of approximately 72 per cent barium sulphate and 28 per cent of zinc sulphide, as the pigments for this class of work. The relative values of these materials for interior use were outlined with respect to whiteness, durability, use with dryers and enamels and in the production of various finishes. Emphasis was placed on the need of economizing in the use of materials and the need of resorting to other ingredients for paints at the present time. The need of clean, dry surfaces was urged as absolutely necessary for success, since even the best materials may give poor results if these conditions are not fulfilled.

Edward H. Brown, editor of the *Painters' Magazine*, gave an extemporaneous talk on the present paint material situation. He said that the present estimate for the flax seed crop of the United States was 11,000,000 bu., whereas the normal consumption for the manufacture of linseed oil was 29,000,000 bu. The average annual production of flax seed in this country is above 16,000,000 bu., the deficiency being made up ordinarily by seed produced in Argentina. However, the last South American crop was a virtual failure and the shortage is a most serious one. China wood oil and other oils that may be used as substitutes in some cases are also scarce owing to inadequate shipping and other reasons. Soya beans and sunflower seeds, the cultivation of which has been encouraged in this country for the production of substitute oils are so much in demand for food, that they do not help the paint oil situation to any extent.

Zinc white is practically out of the market, as the government is now requiring it to be conserved for use in automobile tires. Whiting from which putty is made is also scarce, as it has not been imported for over six months owing to the diversion of shipping in favor of products considered more essential at the present time. Attention was also directed to conditions in England which may eventually obtain here to the serious embarrassment of wall paper hangers. As a measure of food conservation the British government has forbidden the use of flours of any kind for pastes.

H. B. Wilson read a paper on the measures to be taken to protect the public from paint or accident when painters are at work around stations, with particular reference to safe scaffolds and ladders and barriers to keep people away from the wet paint. This led to discussion of the use of drop cloths and building paper to protect floors and furniture.

FEW METERS AND HIGH WATER CONSUMPTION.—With only 6.9 of its services and 21 per cent of its consumption metered a per capita water consumption of 249 gal. a day was indicated at Chicago in 1916, according to the last annual report of John Ericson, city engineer. On a very hot August day the pumpage was 320 gal. per capita, and from 8 to 10 a. m. the rate was 340 gal. per capita. The total pumpage at these two rates was 753,000,000 and 850,000,000 gal. Every available pumping unit was in service.

WAGE INCREASES ORDERED IN JAPAN.—The Far East Commercial Supplement states that the Railway Board has decided to raise the wage standard. Officials receiving less than 40 yen (\$19.94) per month are to have a 2-yen (\$1) increase, and those who are paid per diem are to get 6 sen (3 cents) more each working day. "Two yen a month seems to be a small sum, but it means a great deal to this class of workers. All private establishments will probably follow suit," the newspaper states.—*Commerce Report*.

WASHINGTON CORRESPONDENCE

WASHINGTON, D. C., October 17, 1917.

EASTERN ROADS ASK TO REOPEN RATE CASE

The eastern railroads, at a conference with the Interstate Commerce Commission on Wednesday, will begin negotiations looking to a renewal of their campaign begun early in the spring for a general advance in freight rates which the commission granted only in part in its decision in the 15 per cent case in June. It is understood that the western roads are considering similar action, but have not yet reached a definite decision.

The request of the eastern carriers came in a letter to the commission, dated October 12, from George F. Randolph, commissioner for the lines in Official Classification territory, requesting an informal conference. To this Chairman Hall replied by wire on Saturday that the matters referred to might be presented to the commission at a public session on Wednesday afternoon. Mr. Randolph's letter was as follows:

"The Trunk Line traffic executives, after a discussion today, desired me to try to arrange for a short informal conference with the commission next Wednesday or Thursday (Wednesday preferred) to talk over the rates on traffic not favorably acted upon in the recent decision of the '15 per cent advance in rates case,' some of which are now covered by suspended tariffs and hearings arranged for, others covered by tariffs which carriers cancelled at the suggestion of the commission; and possibly other matters germane to the subject of securing all of the results originally asked for.

"The thought arises from the carriers' keen necessities as shown by the results since the case was presented and was encouraged by the language of the commission on page 23 of its decision as to amplifying its order if the necessity became apparent. If a few of us could have the privilege of such conference on next Wednesday, it is thought it will be of great assistance at the present time in reaching a prompt conclusion as to future action."

The commission's decision allowed advances approximating 15 per cent in the eastern class rates and advances were also allowed to go into effect in the rates on bituminous coal, coke and iron ore. Since then the carriers have filed tariffs on numerous commodity rates, as to which it was claimed that advances were made necessary because of their relation to the class rates and the commission has suspended them.

The hope of the carriers that the commission may change the opinion expressed in its report of June 27 is based on the recent reduction in net income taken in connection with the commission's statement that "we shall, through the medium of the monthly reports of the carriers, keep in close touch with the operating results for the future, and if it shall develop that the fears which have prompted the carriers are realized or that their realization is imminent, we shall be ready to meet that situation by such modification or amplification of the conclusions and orders herein reached and entered as are shown to be justified."

While gross earnings have been increasing rapidly throughout the year expenses have been increasing so much faster that the net operating revenue for eight months of the calendar year, according to the preliminary summary for 177 roads given out by the commission on Saturday, shows a falling off of \$9,000,000 as compared with the corresponding period for 1916. For the eastern roads alone, however, the loss as compared with 1916 was nearly \$40,000,000, the western and southern roads still showing a gain over last year. The eastern roads, however, have shown a decrease in operating income for every month of this year, and the net revenue for eight months, according to the preliminary summary, was \$5,029 per mile as compared with \$5,714 in 1916. Their operating revenues per mile had increased from \$17,955 to \$19,663, but expenses had increased from \$12,209 to \$14,634. For August the western lines also showed a decrease in

net, while the southern lines still showed an increase and for the 220,455 miles of road the net revenue was \$507 as compared with \$528 in August, 1916.

The commission in its decision gave an estimate based on four months' figures that the ratio of operating income to investment for the year would be 5.81 for all roads and 4.89 for the eastern roads, although it said that increasing costs subsequent to April would probably diminish these figures somewhat. For seven months of the year the ratios were 5.55 for all roads as compared with 5.87 for the corresponding months in 1916, and 4.73 for the eastern roads, as compared with 6.51.

There has been considerable talk in Washington recently about a change in the policy of the administration regarding its attitude toward the railways, which it is believed has been brought about in part at least by contact with some of the big men in the railroad and financial world who have been in Washington for war work, and in part by recognition of the important part being played by the railways in carrying on the war. Senator Newlands, chairman of the joint congressional committee on interstate commerce, was recently quoted as follows:

"We have passed that period in the relations of the government and the railways when the activities of the government shall be directed to punitive and correctional action. The things which the government set out to do more than 10 years ago in the way of regulating the railways of the United States have been accomplished. The time is now at hand when the attitude of the government must and will become one of constructive co-operation."

FUEL ADMINISTRATION PROVIDES FOR RAILROAD NEEDS.

The first of a series of orders to distribute coal on a priority basis and regulate the movement of coal cars, issued on October 10 by Fuel Administrator Garfield, provides for taking care of the fuel coal requirements of the Pennsylvania Railroad, which serves about 700 mines, by a plan under which all producers of bituminous along the Pennsylvania will contribute regularly their pro rata share of the fuel needed for its operation, at the prices fixed by the government except where already fixed by contract. It was also announced that other railroads will be served through similar orders soon to follow, which will comprise the first series.

Commercial coal will be distributed by the second series of orders in the apportionment plan, giving preference in order to the government, domestic users, public utilities and all commercial organizations using coal. The present order, which recognizes the fact that unless the railroads are adequately supplied with fuel no one else can be, was adopted after conferences extending over the past two weeks with a committee composed of the following: C. M. Scheaffer, chairman Commission on Car Service; D. E. Spangler, the member of the Commission on Car Service who gives especial attention to coal matters; G. W. Kirtley, assistant to K. S. Lovett, director of priority in transportation; E. H. De Groot, Jr., chief of Division of Car Service, Interstate Commerce Commission; A. G. Gutheim, attorney-examiner Interstate Commerce Commission; L. A. Sneed, representing the Fuel Administration; T. H. Watkins, president Pennsylvania Coal & Coke Corporation; J. Lloyd, Jr., of the Altoona Coal & Coke Company; W. K. Field, president Pittsburgh Coal Company and president National Coal Association; and B. W. Warren, attorney for the Fuel Administration.

The Pennsylvania, like many other railroads, was unable to contract for its full supply before the President's prices went into effect, and not only has the uncontracted coal supply been small but it cannot be obtained at higher prices. The road has therefore been obliged to confiscate coal and to set aside certain days on which it would set cars for loading only with fuel coal. Representations were made some time ago by mine operators to the Fuel Administration that their

coal was being confiscated by the railroad. The statement of the Fuel Administration says that the road's right to do this is unquestioned but that the practice diverted a good deal of commercial coal already contracted for, which displeased dealers to whom it had been consigned and also resulted in an uneconomical use of cars, confiscating cars that otherwise would have been available for commercial loading because often the railroad was obliged to keep coal on the cars longer than is necessary in the regular course of business.

The order provides the method of apportioning the uncontracted coal and also that operators who have already agreed to supply the road with the amount that would be deemed their correct percentage will continue their contracts and remain unaffected by the new order. Other mines must contribute the amount declared to be equitable by the Fuel Administration at the government price. It is stated that the amounts required will, in some instances, interfere with the delivery of full consignments called for by their contracts with customers but the railroads must be kept running and the Fuel Administration suggests that operators withhold coal from persons or corporations needing it least, and that they also attend particularly to the supply of roads other than the Pennsylvania.

"It is deemed particularly essential," the statement continues, "that coal needed by the United States government be not interfered with. The Fuel Administration may make a special priority order in special cases and intends to care fully for domestic users. Munition plants and firms manufacturing necessities of life would come into the priority order class. The plan is expected to show immediate results in an increased supply of coal cars and a steady, equitable flow of fuel to the railroads." Some of those who had to do with drawing up the order also hope that it may have some effect after the present emergency is a thing of the past as a possible foundation for placing the provision of a railroad fuel supply on some regular basis which will recognize the paramount needs of the railroads for coal and do away with the necessity of confiscation and similar methods which often cause much friction. The order is in part as follows:

"It appearing to the United States Fuel Administrator that, under the present method of procuring for the use of the companies hereinafter named railroad coal not now under contract, and which under present conditions can not now be contracted for, by the Pennsylvania Railroad Company for the use of itself and its operated companies . . . there results loss of car efficiency, discrimination in car supply as between mines, disturbance of the mine-labor factor, interference with commercial coal distribution, and interference with priority orders covering the distribution of other coal; and that an adequate and regular supply of bituminous coal for use as railroad fuel by said Pennsylvania Railroad Company and its aforesaid operated companies is necessary for the national security and defense, for the efficient prosecution of the war, and to facilitate the movement of necessities as defined in the act of Congress hereinafter referred to.

"The United States Fuel Administrator acting under authority of an executive order of the President of the United States, dated August 23, 1917, appointing said administrator, and in furtherance of the purpose of said order and of the act of Congress therein referred to and approved August 10, 1917.

"*Hereby orders and directs* that from and after October 15, 1917, and until further order of the Fuel Administrator, but not exceeding the duration of the war in which the United States is now engaged, and subject to modification hereafter by him, producers of bituminous coal operating mines (including mines hereafter opened or beginning or renewing operation) located on the lines of and served by the Pennsylvania Railroad Company and its aforesaid operated companies shall produce, sell, ship, and distribute bituminous coal to said Pennsylvania Railroad Company and its aforesaid operated companies for their use as railroad coal, upon the following plan:

"(1) The percentage proportion which the aggregate requirement of said Pennsylvania Railroad Company and its aforesaid operated companies bears to the capacity of all such mines, as rated by the railroad, shall be ascertained, and each mine which is furnishing such or a greater percentage under contract shall, during the life of the contract, continue so to produce and sell such coal at the contract price, and shall ship and distribute such coal regularly each week when the mine operates and ships, and so far as practicable in equal daily quantities regardless of other obligations.

"(2) The requirement not obtained from mines furnishing such or a greater percentage under the preceding paragraph (1) shall be requisitioned from the remaining mines in the going government price, subject, however, to any revision which may be made retroactively effective in the percentage proportion that such remaining coal requirement of said Pennsylvania Railroad Company and its aforesaid operated companies bears to the capacity of such remaining mines as rated by the railroad, subject, however, to the limitation that each mine under contract shall produce and sell not less than its contract obligation at the contract price, and shall ship and distribute all such coal regularly each week when the mine operates and

ships, and so far as practicable in equal daily quantities, regardless of other obligations.

"*It is further ordered*, That said Pennsylvania Railroad Company and its aforesaid operated companies shall, not later than Saturday of each week, file with the undersigned a statement showing the tonnage of the coal which during the following week shall be requisitioned from each producer and mine upon the authority of this order, and shall post in the office of the car distributor for each district concerned a copy of the statement so filed with the undersigned, and shall give notice to each producer from whom coal shall be requisitioned upon the authority of this order, showing the amount of coal which during the week following shall be requisitioned from each of such producer's mines.

"*It is further ordered* that this order for assuring an adequate and regular supply of bituminous coal for the Pennsylvania Railroad Company and its aforesaid operated companies is hereby given priority, subject, however, to diversion and other regulation by the Fuel Administrator, either generally or in any special case, over all and any contracts of any producer operating mines located on the lines aforesaid."

COAL PRODUCTION

The Fuel Administration issued a statement on October 10 stating that the coal production this year will exceed that of last year by 10 per cent and that of two years ago by 23½ per cent. These figures were compiled by the U. S. Geological Survey in a bulletin showing that last year's bituminous production was in excess of 502,000,000 tons and that this year's production should reach 552,000,000 tons, while anthracite should show substantially the same increase. According to the Geological Survey America is now nearly a month ahead of last year's production at this time. The embargo against sending coal to Canada has been lifted and an arrangement has been made by which it will be supplied on a pro rata basis substantially as though it were a state of the Union. Last year Canada got approximately 19,000,000 tons of coal from this country. "The question of shortage for this year," said Dr. Garfield, "will depend upon whether the American demand has increased by more than the 10 per cent increase in production. If our industrial development, from the war and other causes, has grown beyond that then we must go short. We have no figures at hand to tell what that development has been."

The Fuel Administrator has announced a further classification of bituminous coal mines in several outlying districts allowing considerable increases in the prices as compared with those fixed in the President's original price-fixing order.

Anthracite coal dealers and operators controlling most of the country's supply held a meeting with Federal Fuel Administrator Garfield and his staff on Tuesday, to discuss the anthracite situation and arrange for co-operation in production and distribution.

A working committee of three will be designated among the dealers, to aid in collecting data which are to be put at the disposal of the Fuel Administration. Anthracite is being shipped at present in large quantities to the Northwest, New England and other parts of the country that particularly need it. Shipments to New England during the first eight months of 1917 were 665,704 tons greater than for the corresponding period last year, according to figures furnished the Fuel Administration by the Anthracite Bureau of Information.

Aggregate shipments for the first eight months of this year were 6,455,941. Last year they were 5,790,237. Shipments from the anthracite region have been going forward to New England for the past two months in 50-car trains at the rate of two trains or more a day. Because of the late spring, shipments of anthracite to the upper lake ports to September 1 were slightly less than up to the same time last year. The priority order by which a continuous flow of coal is going westward by water is expected to remedy this soon.

THE RAILWAYS OF HONDURAS.—The railway system of Honduras at the present time consists of 579 km. (359 miles) of line, including those belonging to the National Lines, the line from Puerto Cortes to Potrillos (operated by the state), the Vaccarro Railway (a privately owned line), the Tela Railway, the Cuyamel Fruit Company's line, and the Trujillo Railway.

National Association of Railway Commissioners

President Max Thelen of Association Discusses Railroad Problem and the Duty of Commissioners in War Time

THE 29th annual convention of the National Association of Railway Commissioners was held at Washington beginning October 16 with an attendance of representatives of the Interstate Commerce Commission and of 31 states. Max Thelen, of the California Commission, president of the association, presided.

Henry C. Hall, chairman of the Interstate Commerce Commission, delivered an address of welcome, following the usual custom, in which he referred to the changed conditions in the transportation business brought about by the war and urged the utmost co-operation among the regulating commissions and the carriers and shippers in solving the problems necessary to win the war as speedily as possible. He described the organization of the Railroad's War Board and said that the result of the co-operative action on the part of the railroads was immediately responded to by a similar spirit on the part of shippers. If the railroads had stood on their rights and attempted to act arbitrarily, he said, there never would have been produced such results as have been brought about by the cheerful getting together of both sides. A similar policy had been pursued by the Commission's Division of Car Service in co-operating with the Commission on Car Service, the Fuel Administration and the Director of Priority of Transportation, with the result that it has not been necessary for the Interstate Commerce Commission to issue any orders under the authority conferred by the Esch-Pomerene law.

The various interests have been able to work together in such a way that their action has been the result of a consensus of opinion as to what was best, and as a result the orders of the Commission of Car Service have met with almost unanimous and instant response from the individual railways because there has always been knowledge that if any of its orders were not complied with they might be followed up by mandatory orders of the Interstate Commerce Commission. This illustrates, Chairman Hall said, that the importance of the existence of power is not always shown by the use of that power; often the knowledge that it is there is sufficient. Referring to the activities of regulating bodies, he said that the necessity of winning the war bears upon all in their respectful official capacities and, in so far as is consistent with the laws under which they act, the state of war should be considered as a prime factor in whatever action is taken. He referred to the increased inefficiency of freight operation, brought about by the co-operation of shippers and carriers as an example to all and urged special efforts to compose differences before they reached the stage of formal litigation. He also reiterated the commission's former recommendations toward a greater degree of co-operation between the state and the federal commissions, saying that although there has been no legislation along these lines, the association, through the selection of a committee, might prepare the way for such co-operation during the war in such a way as to avoid any conflict of jurisdictions. Chairman Hall referred to the law passed by Congress last year giving the President power to take over the operation of railroads if necessary, saying that the power to commandeer the railroads has not been exercised, while the power to commandeer carriers by waters has been exercised. This power over the railroads, he said, may yet be exercised, but thus far all who have had to deal with the problems of railway transportation have worked together so harmoniously that the President has not seen the need of exercising his authority.

Max Thelen, president of the association, delivered the

opening address of the convention, in which he said in part:

THE DUTY OF THE STATE COMMISSIONS DURING AND AFTER THE WAR

"At this time, when individual action yields to collective patriotic endeavor, each member of the National Association of Railway Commissioners asks himself—What action can I take and what action can my commission take to serve the nation during the war, and what can I do now in preparation for the vital problems which will come after the war, so that they may be wisely and patriotically solved and so that the nation in the solution thereof may grow stronger, more efficient and more fit?

"It, of course, goes without saying that each commissioner pledges himself unreservedly to every service which his state and his nation may ask of him in the present emergency. We all desire to be of service, but to many of us the path of most effective service is not clear. In the hope of being able to translate our desire to help into terms of specific and definite action, I shall draw attention to certain steps which, in my judgement, the various state commissions can and ought to take to help the nation in the war.

"To assist in the solution of our serious car shortage problem, the state railroad and public service commissions have sent circular letters urging all shippers to co-operate with the railroads by prompt loading, by loading to full capacity and by prompt unloading of freight cars, by distributing empty cars into districts where needed, increasing the daily mileage of locomotives and freight cars, reducing the number of locomotives and freight cars awaiting repairs in shops, and other measures the railroads have patriotically assisted in securing greater efficiency of their limited transportation equipment. While the co-operation of the public authorities, the shippers and the railroads has produced gratifying results, the situation is still serious and threatens to become more acute during the remaining months of the year.

"The state commissions must render further service in the car shortage problem. Wherever we find in our states that extra fare or limited passenger trains are being run in excess of reasonable necessity, wherever we find that unnecessary trains of any character are being operated between competitive points, wherever we find that other unnecessary expenses are still being incurred by the railroads, it is the duty of the state commissions to take affirmative action, to draw the matter to the attention of the railroads and to urge them, not merely to authorize them, to eliminate the unnecessary service and expense so as to conserve their transportation efficiency. While we are at war, the American people do not need luxurious passenger service. In these matters the state commissions should be leaders and not followers.

"The permanent solution of the car shortage and other fundamental railroad problems are matters to which I shall hereinafter refer. Let us, however, at the present time take every emergency measure which can be of assistance, even though temporarily inconveniencing our people, so as to help win the war.

"So important do I regard the giving of direct and immediate assistance by the state commissions to help win the war that I recommend to this convention that it create a Special War Committee which shall be charged with the duty of conferring with the appropriate federal and state authorities and with each state commission and of giving advice

and suggestions as to what each commission can do affirmatively and constructively to help the nation in the present emergency."

Mr. Thelen referred to the applications of the steam railroads to the Interstate Commerce Commission and to the various state commissions to increase their freight rates 15 per cent, which, he said, were based largely on increased operating expenses due to the war, but he said it is a matter of gratification that concurrently with these increased operating expenses there have been such increases not only in gross revenues, but also in net revenues that it will presumably not be necessary for the steam railroads to press their applications where they have not already been dismissed. He then referred to the increases in net earnings in the early months of the year and said that, while there was a decrease for the first six months, the position of the railroads should be measured not by comparison with the record year of 1916, but by the increase of nearly \$155,000,000 in net earnings for the corresponding six months of 1915. While he considered the steam railroads in a condition of prosperity, he declared that many other public utilities have not enjoyed the increase in business which has come to the railroads and that the state commissions should give prompt and sympathetic consideration to their applications for higher rates.

Where applications of railroads for the reduction of elimination of service are reasonably necessary to increase efficiency, they should, he said, be granted, but reductions in necessary service to rural communities and other portions of the country should not be allowed while the carriers at the same time "continue to maintain expensive, not to say, luxurious and largely unnecessary service between competitive points for the purpose of securing business from their rivals.

Expenditures for additional railroad depots or for other new structures or extensions, he said, will, of course, not be ordered by the state commissions while the nation is at war unless absolutely necessary, but he resented the efforts of various public utility representatives to secure from commissions the enactment of formal resolutions that the commission will not order the railroads and other utilities to incur unnecessary expenditures during the war. Before these suggestions were made, he said, most of the state commissions had already decided to refrain from directing any public utility to incur substantial expenditures which can fairly and reasonably be deferred until after the war.

Discussing the railroad problem, Mr. Thelen continued in part as follows:

THE RAILROAD PROBLEM

"The railroad problem in the United States has permanently moved beyond the ownership and operation of the railroads as disconnected entities by private companies. The issue now and hereafter is an issue between consolidated operation of our railroads in private ownership and their unified operation directly by the people through government ownership. National exigency, lofty patriotism, and perhaps a realization that government operation was immediately impending unless private operation met the emergency, prompted the railroads of the United States, immediately after the declaration of war, to operate as a single consolidated American system and in doing so, to eliminate a portion of the waste and inefficiency which were pointed out by the Interstate Commerce Commission in the Five Per Cent Advance Rate Case and which for years have been recognized and commented upon by state railroad commissioners and other students of railroad problems. But what is now being accomplished is only a small part of what must be done if our railroads are to measure up to our new standards of national efficiency.

"Who has not seen passenger and other trains constantly running half empty over two, three or four parallel rail-

road tracks, between the same communities? Who has not seen in our large cities splendidly equipped passenger and freight offices of competing railroad systems, side by side, on the same street, with hosts of competing passenger solicitors, freight solicitors, and other employees, all striving to take business away from the competing railroads? Who has not seen luxurious and unnecessary passenger trains operated by rival railroads at great expense between competitive points for the purpose of attracting freight business from other railroads operating between the same points? Who has not seen in multitudinous forms the results of our laissez faire policy which has permitted our railroads to develop duplications of facilities and of service which have resulted and still result in enormous annual losses to the nation? Who has not observed the increasing difficulty or our railroads in securing at reasonable interest rates or at all the new capital imperatively necessary for extensions and betterments? Who has not observed the unsound financial structures of many of our railroads, leading to bankruptcy proceedings as inevitably as the inexorable laws of time? I am not now speaking of causes but only of the facts which are patent to all.

"These conditions may be summarized as follows:

- "1. Duplication of facilities.
- "2. Duplication of service.
- "3. Duplication of operating expenses.
- "4. Difficulty in securing necessary new funds.
- "5. Unsound financial structures.

"What the railroads are now doing is being patriotically done and deserves and is receiving the unstinted praise and commendation of all American citizens. But what they are now doing in seeking to ameliorate car shortage is merely a scratching of the surface. The other conditions to which I have referred must be remedied if our railroad transportation system is to substitute efficiency and financial stability for inefficiency and weakness and if it is to measure up to the standard of national efficiency which the people of the United States will imperatively demand after the war.

"The question to which thoughtful students of public affairs have been and are now giving attention and to which we as public officials engaged in the supervision and regulation of railroads must give consideration is—Will these necessary changes be brought about under private consolidated management of the railroads or are we to be driven for their solution to government ownership?

"These problems and others are included in the exhaustive program of the Joint Congressional Committee of the Senate and the House of Representatives, commonly known as the Newlands committee.

"With the exception of federal control over the issue of securities, the remedies which have been proposed by the railroads to the Newlands committee are, in my opinion, merely patchwork. They will not cure the matters to which I have referred, which matters are fundamental. Federal incorporation of the railroads is in itself merely a shifting of the machinery of corporate organization and control and as proposed by the railroads will cure none of the fundamental conditions from which the railroads are suffering.

"One of the questions which is included in the program of the Newlands committee is the comparative worth and efficiency of government regulation and control as compared with government ownership and operation.

"The last convention of this association authorized the appointment of a special committee on public ownership and operation, with instructions to consider and report at this convention on the question of public ownership and operation as contrasted with private ownership and operation of public utilities. This committee will present to the convention a report showing its understanding and interpretation of the present-day trend of the changing relations between the public utilities and the people and suggesting to

this association a general outline of the subject, with recommendations indicating along what lines further investigations and studies should be made.

"The subject is one of increasing importance. In my opinion, this association can do no greater constructive work than to ascertain and report the facts in connection with the private and the public ownership and operation of public utilities, so that if this nation should hereafter find it necessary to resort to public ownership and operation of our railroads and other public utilities, it may have at hand a solid foundation of fact on the basis of which it can enter on such task wisely and successfully.

FEDERAL RAILROAD VALUATION

"The Interstate Commerce Commission is at the present time engaged in the most gigantic public utility valuation in the world's history. I refer to its ascertainment of the facts entering into the value of the property of the railroads of the United States, generally known as the federal railroad valuation.

"The Interstate Commerce Commission, through its Division of Valuation, has been hard at work and has made substantial progress. The valuation will be of tremendous importance to the people of the United States when our people finally enter upon the scientific and comprehensive control over the issue of railroad securities and will be of inestimable value if it hereafter becomes necessary to have the government itself take over and operate the railroads.

"The carriers seem to be generally opposed to the ascertainment of the facts by the federal government. The Boston American of August 23, 1917, is authority for the statement that the Advisory Commission of the Council of National Defense, consisting largely of representatives of the railroads and affiliated interests, had advised the Council of National Defense to have the valuation of the railroads suspended during the war. That an effort to suspend or stop the valuation was made is generally known. The effort thus far has been unsuccessful.

"There is nothing in the present emergency which would justify the suspension of the valuation work. For the purpose of taking intelligent action hereafter, the people of the United States are entitled to know, as promptly as possible, the facts with reference to the value of our railroad properties. The valuation work must go on.

"I recommend to this convention that the work of its Valuation Committee be continued and to the various states of the union that they continue, to the extent of their respective abilities, the unselfish and patriotic support which they have heretofore given to this association and to its valuation committee in this work.

"Within the last few months, the railroads have resumed their campaign of publicity against the state and federal commissions. I have purposely said nothing on this subject in my address and I do not propose now to do so. While this nation is at war is not a proper time for the railroads to again enter upon their attacks. Rather should we all unite our efforts and present a common front, so that in harmonious, united action the nation can be most effective in the present contest."

OTHER REPORTS

Reports were presented by 31 standing committees as follows: Executive Committee, Express and Other Contract Carriers by Rail, Safety of Railroad Operation, Railroad Service Accommodations and Claims, Grade Crossings and Trespassing on Railroads, Railroad Rates, Statistics and Accounts of Railroad Companies, Car Service and Demurrage, Public Utility Rates, Service of Public Utility Companies, Safety of Operation of Public Utility Companies, Statistics and Accounts of Public Utility Companies, Valuation, Capitalization and Intercorporate Relations, State and Federal Legislation, Publication of Commissions' Decisions, and Special Committee, Public Ownership and Operation.

The Committee on Safety of Railroad Operation, C. C. McChord, of the Interstate Commerce Commission, chairman, presented a résumé of the authority and activities of the state commissions which have reported to it on this subject and presented the following recommendations, believing that proper action upon each of them will result in material increase in the safety of railroad operation:

(1) That the inspection of railroad tracks and track equipment by all the commissions having jurisdiction with respect thereto be continued and extended.

(2) That the use of the block system should be made compulsory.

(3) That steps be taken to secure uniformity of operating rules on the railroads of the United States.

The Committee on Grade Crossings and Trespassing, J. B. Walker, of the New York Commission, chairman, presented a discussion of grade crossing reforms in the various states in a series of recommendations on the trespassing situation, as follows:

(1) The passage of such federal legislation as may be necessary to eliminate trespassing on railroad rights-of-way. We believe this would be best accomplished by a statute which would be enforceable not alone by the federal authorities but by state and local authorities as well. We believe that to make this statute effective its violation should carry a suitable punishment for the offender either by fine or imprisonment or both.

(2) That the commission of each state give wide publicity to the statistics covering trespass accidents and lose no opportunity to point out that trespass laws are intended to protect human life and limb rather than property rights.

(3) That the railroad companies continue the anti-trespass campaign they have inaugurated and that the state commissions render them all possible assistance in carrying them out.

The Committee on Statistics and Accounts, Arthur A. Lewis, of the Washington Commission, chairman, presented a recommendation that a committee consisting of one member, respectively, of the statistical or accounting department of each commission, the Interstate Commerce Commission and the Association of American Railway Accounting Officers, be appointed by the president of this association for the purpose of preparing and submitting to the next annual convention a uniform annual report schedule.

The Special Committee on Public Ownership and Operation, E. O. Edgerton, of the California Commission, chairman, agreed that no report should be written or can be written at this time with definite conclusions or definite recommendations for or against public ownership. The committee was agreed that any recommendation on so important a question should not be a matter of opinion merely adding argument to the already endless controversy, but should be based on the most exhaustive and thoughtful study of all phases of the problem. It recommended that the National Association appoint a permanent committee to deal with this question to represent the association, if necessary, before governmental or other bodies, if prior to the end of the coming year important action should be taken by the government in this direction, and to make a report to the national association at its next meeting.

Samuel Rea, president of the Pennsylvania Railroad, addressed the members at a banquet on Wednesday evening. An abstract of this address will be found on another page of this issue.

EMBARGO ON CANADIAN RAILS.—An order-in-council has been passed at Ottawa, Can., under the War Measures Act, prohibiting the exportation of steel rails from Canada to countries other than the United Kingdom, British possessions and protectorates.

RAILWAY OPERATING EFFICIENCY

How each freight car and locomotive in the service of the railroads of the United States has been doing its bit in the way of increased service to help win the war is clearly shown in the monthly reports just received by the Railroads' War Board of freight operations during the month of July and in a similar compilation giving the combined results for the three months April, May and June, the second quarter of the year.

With only 1.3 per cent more locomotives in service and

an increase of 18.7 per cent in the efficiency of each locomotive. The revenue ton miles per car increased 17.5 per cent.

This was accomplished, the report shows, by increasing, the number of tons of freight to each train from 617 to 681, or 10.4 per cent, and loading an average of 2.7 tons more, or 11.1 per cent, in each car, while the average mileage run by each locomotive per day was increased 4.4 miles or 6.8 per cent. The average mileage per car per day increased 1.9 or 7.2 per cent. While the percentage of empty car mileage was increased slightly, 3.9 per cent, the average number of cars in shop or awaiting shop was reduced 9.1 per cent and

MONTHLY REPORT OF FREIGHT OPERATION OF STEAM RAILWAYS, JULY, 1917

Item	United States				Eastern District			
	1917	1916	Increase or decrease		1917	1916	Increase or decrease	
			Amount	Per cent			Amount	Per cent
Freight train-miles.....	53,483,629	49,311,357	4,172,272	8.5	22,127,436	21,116,751	1,010,685	4.8
Loaded freight car-miles.....	1,342,580,804	1,246,433,820	96,146,984	7.7	588,349,818	566,875,846	21,473,972	3.8
Empty freight car-miles.....	635,003,604	556,588,893	78,414,711	14.1	286,348,397	272,671,828	13,676,569	5.0
Total frt. car-miles—loaded and empty..	1,977,584,408	1,803,022,713	174,561,695	9.7	874,698,215	839,547,674	35,150,541	4.2
Freight locomotive-miles.....	64,539,455	59,672,105	4,867,350	8.2	29,759,120	28,306,230	1,452,890	5.1
Revenue ton-miles.....	33,434,368,526	27,809,430,998	5,624,937,528	20.2	16,586,674,317	14,184,885,284	2,201,789,033	15.5
Non-revenue ton-miles.....	2,967,003,099	2,599,605,754	367,396,345	14.1	936,839,600	784,092,584	152,747,016	19.5
Ave. No. of freight locomotives:								
In service.....	30,277	29,888	389	1.3	12,875	12,666	209	1.7
In shop or awaiting shop.....	4,122	4,460	d 338	d 7.6	1,801	1,910	d 109	d 5.7
Ave. No. of freight cars:								
In service.....	2,256,621	2,204,902	51,719	2.3	1,175,505	1,154,731	20,774	1.8
In shop or awaiting shop.....	135,831	144,478	d 8,647	d 6.0	74,281	76,460	d 2,179	d 2.9
Home.....	102,862	116,752	d 13,895	d 11.9	55,790	61,449	d 5,659	d 9.2
Foreign.....	32,969	27,721	5,248	18.9	18,491	15,011	3,480	23.2
Tons per train.....	681	617	64	10.4	783	709	74	10.4
Tons per loaded car.....	27.1	24.4	2.7	11.1	29.4	26.4	3.0	11.4
Ave. miles per locomotive per day.....	68.8	64.4	4.4	6.8	74.6	72.1	2.4	3.5
Average miles per car per day.....	28.3	26.4	1.9	7.2	24.0	23.5	0.5	2.1
Per cent of empty car-miles.....	32.1	30.9	1.2	3.9	32.7	32.5	0.2	0.6
Per cent of frt. locos. in or await. shop.....	13.6	14.9	d 1.3	d 8.7	14.0	15.1	d 1.1	d 7.3
Per cent of frt. cars in or await. shop.....	6.0	6.6	d 0.6	d 9.1	6.3	6.6	d 0.3	d 4.6
Revenue ton-miles:								
Per locomotive.....	1,104,283	930,455	173,828	18.7	1,272,751	1,119,918	152,833	13.6
Per freight-car.....	14,816	12,613	2,203	17.5	13,940	12,284	1,656	13.5
Average miles operated—single track..	220,054.30	219,734.97	319.33	0.1	56,032.46	56,222.76	d 190.30	d 0.3

Item	Southern District				Western District			
	1917	1916	Increase or decrease		1917	1916	Increase or decrease	
			Amount	Per cent			Amount	Per cent
Freight train-miles.....	8,532,367	7,405,757	1,126,610	15.2	22,823,826	20,788,849	2,034,977	9.8
Loaded freight car-miles.....	205,320,169	176,659,282	28,660,887	16.2	548,910,817	502,898,692	46,012,125	9.1
Empty freight car-miles.....	104,371,329	83,061,379	21,309,950	25.7	244,283,878	200,855,686	43,428,192	21.6
Total frt. car-miles—loaded and empty.....	309,691,498	259,720,661	49,970,837	19.2	793,194,695	703,754,378	89,440,317	12.7
Freight locomotive-miles.....	9,540,951	8,225,755	1,315,196	16.0	25,229,384	23,140,120	2,089,264	9.1
Revenue ton-miles.....	5,141,893,352	4,126,779,203	1,015,114,149	24.6	11,905,800,857	9,497,766,511	2,408,034,346	25.4
Non-revenue ton-miles.....	529,036,877	402,632,068	126,404,809	31.4	1,501,125,622	1,412,881,102	88,244,520	6.2
Ave. No. of freight locomotives:								
In service.....	4,896	4,863	33	0.7	12,506	12,359	147	1.2
In shop or awaiting shop.....	620	640	d 20	d 3.1	1,701	1,910	d 209	d 11.0
Ave. No. of freight cars:								
In service.....	279,014	276,158	2,856	0.8	802,102	773,413	28,689	3.7
In shop or awaiting shop.....	15,081	18,555	d 3,474	d 18.7	46,469	49,463	d 2,994	d 6.1
Home.....	11,645	15,764	d 4,119	d 26.1	35,427	39,544	d 4,117	d 10.4
Foreign.....	3,436	2,791	645	23.1	11,042	9,919	1,123	11.3
Tons per train.....	665	612	53	8.7	587	525	62	11.8
Tons per loaded car.....	27.6	25.6	2.0	7.8	24.4	21.7	2.7	12.4
Average miles per locomotive per day.....	62.9	54.6	8.3	15.2	65.1	60.4	4.7	7.8
Average miles per car per day.....	35.8	30.3	5.5	18.2	31.9	29.4	2.5	8.5
Per cent of empty car-miles.....	33.7	32.0	1.7	5.3	30.8	28.5	2.3	8.1
Per cent of frt. locos. in or await. shop.....	12.7	13.2	d 0.5	d 3.8	13.6	15.5	d 1.9	d 12.3
Per cent of frt. cars in or await. shop.....	5.4	6.7	d 1.3	d 19.4	5.8	6.4	d 0.6	d 9.4
Revenue ton-miles:								
Per locomotive.....	1,050,223	848,608	201,615	23.8	952,007	768,490	183,517	23.9
Per freight-car.....	18,429	14,911	3,518	23.6	14,843	12,280	2,563	20.9
Average miles operated—single track.....	37,207.73	37,103.21	104.52	0.3	126,814.11	126,409.00	405.11	0.3

d Decrease

only 2.3 per cent more freight cars than in July, 1916, railroads operating 220,054 miles of line in July, 1917, handled 20.2 per cent more ton miles of revenue freight. In other words, the 30,277 freight locomotives in service in July handled the equivalent of 33,434,368,526 tons of revenue freight one mile, or an average of 1,104,283 ton miles for each locomotive, as compared with 930,455 in July, 1916,

the average number of locomotives in shop or awaiting shop was reduced 8.7 per cent.

For the three months' period, for 227,156 miles operated, the increase in revenue ton miles was 17.6 per cent, while the increase per locomotive was 16.1 per cent and per car was 15.3 per cent.

The figures for July are shown in the table.

Automatic Straight Air Brake System

Description of the Design and Operation of a New Triple Valve for Passenger and Freight Equipment

A NEW air brake system has recently been perfected by the Automatic Straight Air Brake Company, 14 Wall street, New York, for freight and passenger equipment, which contains many new and interesting features of operation. The purposes of this brake are to give rapid serial action to the brakes throughout a train, to maintain a constant and uniform brake cylinder pressure regardless of piston travel, to permit a variation of brake cylinder pressure at the will of the engineman, to provide a proper and quick release of the brakes for any brake pipe reduction, to

The triple valve is made up of disk valves and diaphragms, no slide valves or pistons being used.

Due to its construction and operation this brake has the characteristics of a straight air brake and at the same time is automatically operated. The straight air features are obtained through the fact that with every application of the brakes air is exhausted from the brake pipe under each car. In case of a service application air from the brake pipe is exhausted into the brake cylinder and in case of an emergency application the air from the brake pipe is exhausted to the atmosphere. In the first case the air is not wasted but is used to build up the pressure in the brake cylinder in conjunction with the supply of air from the service reservoir. In both cases the rapidity of serial action is increased due to the fact that the brake pipe pressure is reduced locally at each car.

The design of the triple valve is such that when fully charged the pressure in the brake pipe acting on the underside of a diaphragm balances the pressure in the auxiliary reservoir acting on the upper side. A reduction in brake pipe pressure causes the auxiliary reservoir pressure to force the diaphragm downward admitting air to the brake cylinder from the brake pipe and service reservoir. The air in the brake cylinder acts on a second diaphragm which is connected to the first and which is of one-half its area. The pressure in the auxiliary reservoir remains unbalanced forcing the diaphragm down until the force exerted by the brake pipe pressure on the underside of this diaphragm plus force exerted by the air in the brake cylinder on its diaphragm exceeds it. The diaphragm will then be raised and the supply of air to the brake cylinder cut off. Thus it will be seen

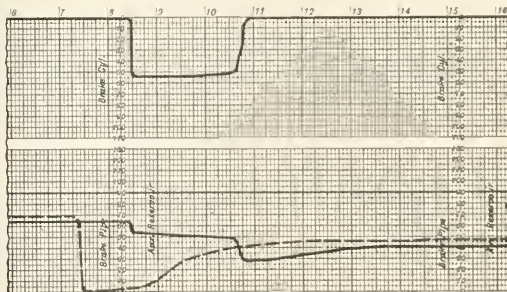
Service Application of the Brakes with Quick Release

The top curve represents brake cylinder pressure, the full line in the lower set of curves represents the pressure in the auxiliary reservoir, while the dash line shows the pressure in the brake pipe. The pen indicating the brake pipe pressure is set a distance of one minute back of the pens indicating the brake cylinder and auxiliary reservoir pressures. The above curves show that as the brake pipe pressure is reduced, the brake cylinder pressure of 20 lb. is obtained at once, which is increased on further reduction of the brake pipe pressure to about 50 lb., the pressure in the auxiliary reservoir remaining constant. With the building up of the brake pipe pressure, a small amount of air from the auxiliary reservoir is released to the brake pipe to hasten the release, the rapidity of release being indicated by the brake cylinder curve.

provide for a full emergency application of the brakes at any time, to provide a graduated or quick release as desired, and to provide an economical use of air.

This brake system provides a quick action passenger brake, one brake cylinder being used for a service application and two brake cylinders for an emergency application of the brakes. As the triple valve is capable of compensating for varying volumes in brake cylinders, a second brake cylinder can be added to existing freight equipment for empty and load braking, the braking system retaining at the same time all of its functions and principles.

The brake is operated by the engineman in the same manner as is common with present day practice. The equipment can be used interchangeably with other existing equipment. The main features of this new brake are found in an entirely new triple valve with its auxiliary, service and quick action reservoirs. The auxiliary reservoir is of the same volume as that ordinarily used, the service reservoir has a volume of 2,100 cu. in. and the quick action reservoir a volume of 200 cu. in., which with an additional volume due to brake pipe connections, gives an increase in volume of about 2,300 cu. in. per car on 10-in. freight equipment. The service reservoir is used for service and emergency applications of the brake, the auxiliary reservoir is used for an emergency application of the brake and for a quick release of the brake in contrast to a graduated release. The quick action reservoir is used only in making an emergency application of the brakes.



Emergency Application of the Brakes

In this case the brake pipe pressure was reduced to zero, giving an instantaneous brake cylinder pressure of 55 lb. with an accompanying decrease in auxiliary reservoir pressure. At release more air is taken from the auxiliary reservoir to aid the release as described under the quick release operations, the brake being released in about 10 seconds. Due to the construction of the triple valve, the auxiliary reservoir pressure is then raised, through the charging port, with the brake pipe pressure, the difference in the amount being due to the spring used on the auxiliary reservoir diaphragm. This record was obtained from car 61 in the 100-car test rack described in the test.

that the brake cylinder pressure bears a direct relation to the brake pipe reduction and is not affected by the brake piston travel or brake cylinder leakage. By regulating the brake pipe pressure, any brake cylinder pressure may be obtained.

Each triple valve is provided with means for making a graduated or quick release. The graduated release is obtained by building up the brake pipe pressure from the locomotive. The quick release feature is obtained by raising the

brake pipe pressure three pounds, at which time auxiliary reservoir air is released to the brake pipe under each car.

Interesting features of this brake are that service applications can be varied at the will of the engineman by his regulation of the brake pipe pressure without the necessity of releasing the brakes before a re-application when operating with the graduated release, and the fact that the auxiliary reservoir maintains a reserve supply for a full emergency application, regardless of the number of service applications made. The triple valve is of such a design that after a train has once been charged, an emergency application will automatically be made if for any reason the brake pipe pressure should be reduced to zero.

This company has been making a series of exhibition tests on a 100-car test rack composed of 51 A S A brake equipments and 49 brake equipments in common use today, which were attended by between 200 and 300 railroad representatives. The equipments have been distributed in multiples of five throughout the train, that is, five A S A equipments, five other equipments, etc., with the hundredth car being an A S A equipments. These tests have shown that the time between the application of the brakes on the first car and the hundredth car with a service application is about 14 seconds, and with an emergency application about 8 seconds. Records taken on trainographs of a service application with quick release,

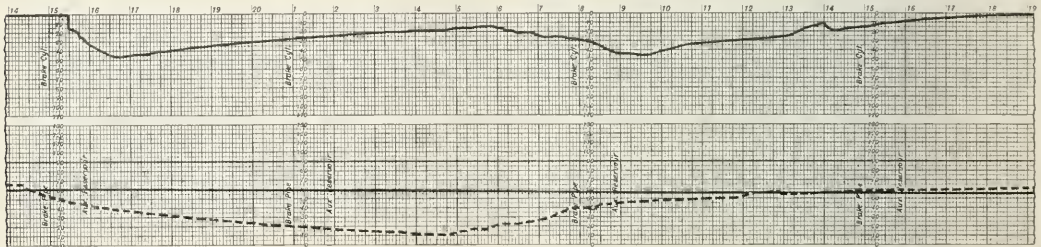
by the maintaining valve when open, to pipe 41c and on top of the valve 77. The air passing through valve 55 passes through pipe 10 to chamber 85 of the change-over valve and from there through valve 95 and hollow stem 94 to the service reservoir. From chamber 85 the air also passes up through ports 14 into chamber 90 above the diaphragm 88. The air passing through valve 55 also passes to chamber 47 above the diaphragm 43. As the pressure in chamber 47 plus the pressure caused by spring 50 equalizes with the pressure in chamber 40a, the diaphragm 43 will be depressed, allowing valves 71 and 55 to be closed by their springs.

Emergency Section.—The air in pipe 1a passes to chamber 39a past the clearance 44 into chamber 40 above the diaphragm 39, keeping the valves 60 and 60a closed. This pressure also acts on valve 46, keeping it closed. From chamber 39a the air also passes through the port 68 to the chamber 81 directly through port 74 and to the quick action reservoir.

SERVICE BRAKE APPLICATION

The service application of the brake is made in the usual way by reducing the brakepipe pressure. This reduces the pressure in chamber 2 of the service section and pipe 1a lead to the emergency section.

Service Section.—The reduction in pressure in chamber 2



Performance of the Brake Under Conditions of a Gradually Depleted Brake Pipe, Showing the Performance Under Graduated Release

With the reduction in brake pipe pressure, the brake cylinder pressure increases until both are about 45 lb. From that point a further reduction in brake pipe pressure will cause a reduction in brake cylinder pressure, and in no case below this point will the brake cylinder pressure be less than the brake pipe pressure. A prolonged reduction of the brake pipe pressure was made purposely to disclose this fact. As the brake pipe pressure increases, the brake cylinder pressure increases until a pressure of 45 lb. is obtained in both the brake cylinder and brake pipe. From that point on, the graduated release goes into operation and with a further increase in brake pipe pressure, the brake cylinder pressure will be reduced. It will be noted that the auxiliary reservoir pressure has not changed.

a service application with graduated release and an emergency application are shown in the illustrations.

The following, to be used in connection with a diagrammatic illustration of the triple valve, gives an outline of the operation of the A S A triple valve:

CHARGING THE TRIPLE VALVE

The air from train line 1 passes into chamber 2 of the service section and into pipe 1a leading to the emergency section.

Service Section.—The air pressure in chamber 2 acts on the diaphragm 3, raising it until the valve 9 is uncovered. This permits the air to pass through a small port 18 into chamber 4 and the auxiliary reservoir. The spring 7c exerts a force equivalent to three pounds of air and as soon as the pressure in chamber 4 is within three pounds of the pressure in chamber 2, the valve 9 will close.

The air from chamber 2 also passes through port 12 into the hollow stem 6 past the non-return valve 32a into chamber 30 and on top of valve 32.

From chamber 2 the air also passes through the passage 42 to chamber 40a where it raises the diaphragm 43 which lifts the left hand end of lever 65, opening valves 71 and 55. The air passing through valve 71 passes through pipe 68

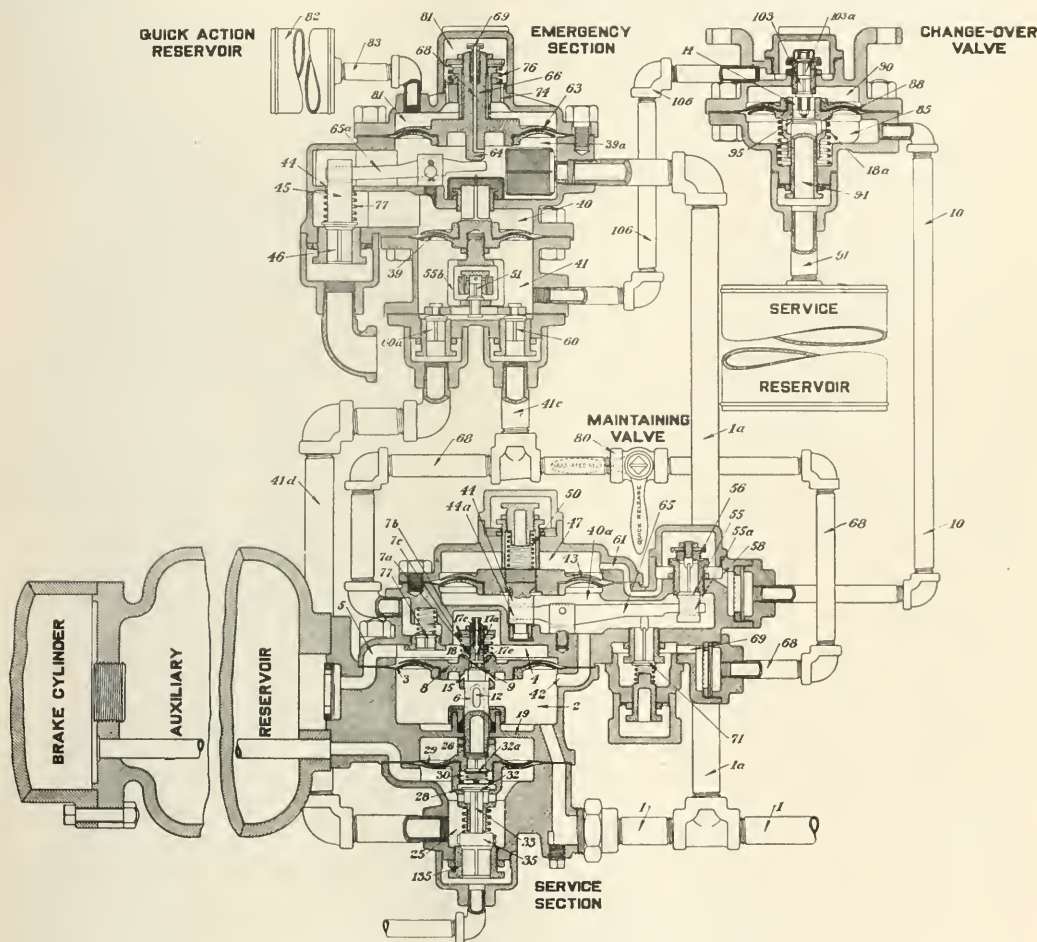
permits the pressure in the auxiliary reservoir and chamber 4 to depress the diaphragm 3. This lowers the valve stem 6 and with it diaphragm 29, valve cage 28 and valve 32 and with it valve 35 which is rigidly connected to 32. As valve 35 seats on the cage 135, the opening between the brake cylinder and chamber 25 with the atmosphere is closed. The cage 28 drops away from the valve 32, permitting the air in chamber 30 to pass into chamber 25 which is connected directly to the brake cylinder, thus charging the cylinder. Air also flows from chamber 40a and from the service reservoir through the valve 95, pipe 10 and valve 55 to chamber 2, thus augmenting the air supply in chamber 2 which passes to the brake cylinder.

As the force exerted by the air pressure in chamber 25 on the diaphragm 29 plus the force exerted by the air pressure in chamber 2 on diaphragm 3 exceed the force exerted by the air pressure in chamber 4 plus the pressure of spring 7c, the spindle 6 will be raised with the valve cage 28, seating valve 32, cutting off the supply of air to the brake cylinder. Since the area of diaphragm 29 is about one-half that of diaphragm 3, the pressure in chamber 25 to provide equilibrium will be about twice the reduction made in chamber 2. If for any reason the pressure should leak off from the brake cylinder, the forces will again become unbalanced and

valve 32 will again be open until equilibrium is once more established. In this way the brake cylinder pressure will always remain a certain definite function of the brake pipe for each brake pipe reduction. The air pressure in chamber 47 will be reduced with the pressure above the valve 55, but as it with the spring 50 is greater than the pressure in chamber 40a, the diaphragm 43 will always remain down during the service application of the brake.

Emergency Section.—The reduction of the brake pipe pressure causes a reduction in chambers 39a and 40 without operating any of the parts. The reduction is so gradual

sure in chamber 2, diaphragm 3 and with it valve stem 6, diaphragm 29 and valve cage 28 will be raised, this will lift valve 35 from its seat, permitting the pressure from the brake cylinder to release to the atmosphere, until the pressure in chamber 25 has been reduced sufficiently to re-establish the balance destroyed by the increase in brake pipe pressure. At this time the service section will again move to lap position. In this way the release may be graduated in as many steps as desired, the full release being obtained when the brake pipe pressure has been restored sufficiently to balance the auxiliary reservoir pressure. In



Triple Valve for the Automatic Straight Air Brake System

that the pressure from 81 will be relieved through passage 69 without operating diaphragm 63.

RELEASING THE BRAKES

Graduated Release.—To obtain the graduated release the maintained valve 80 is closed, thus cutting out the use of the valve 77 and the auxiliary reservoir pressure. With the service section in lap position, that is, with the pressures in chambers 25 and 2 balancing the auxiliary pressure in chamber 4, by raising the brake pipe pressure and the pres-

sure in chamber 2, diaphragm 3 and with it valve stem 6, diaphragm 29 and valve cage 28 will be raised, this will lift valve 35 from its seat, permitting the pressure from the brake cylinder to release to the atmosphere, until the pressure in chamber 25 has been reduced sufficiently to re-establish the balance destroyed by the increase in brake pipe pressure. At this time the service section will again move to lap position. In this way the release may be graduated in as many steps as desired, the full release being obtained when the brake pipe pressure has been restored sufficiently to balance the auxiliary reservoir pressure. In

Quick Release.—To obtain the quick release, the maintaining valve 80 is opened, as shown by the full lines in the illustration. With the increase in pressure in chamber 2, the performance of the service section will be as described above. The pressure in chamber 40a will be built up, raising diaphragm 43 and with it the left hand end of lever 65, which will open valve 71 a short time ahead of valve

55 on account of the clearance between the right hand end of the lever and the bottom of the slot in the valve body 55a. Opening valve 71 permits air from the auxiliary reservoir which is at a higher pressure than the air in chamber 40a to pass forward through valve 77, pipe 68, through valve 71 into chamber 40a, thus rapidly increasing the pressure in chamber 2 and insuring a quick release of the air pressure from the brake cylinder. With the brakes released the system will be recharged as described above.

EMERGENCY APPLICATION

There are no movements of the parts in the emergency section during charging, service, lap, and release operations. The moderate service brake pipe reductions permit the air to flow from the quick action reservoir 82 to the train pipe through the restriction screw 69 at the same rate as the brake pipe reduction is taking place, thereby maintaining equal pressures on both sides of diaphragm 63.

To obtain an emergency application, a rapid and prolonged brake pipe reduction is made. This causes the service section to assume service position quickly and reduces the pressure in chamber 39a of the emergency section faster than the pressure in the quick action reservoir 82 can be reduced through the restriction screw 69.

The pressure in chamber 81 above diaphragm 63 will then be higher than the pressure in chamber 39a, with the result that diaphragm 63 will be forced down. Stem 64, moving with the diaphragm, will depress the inner end of the fulcrum lever 65a and the left end will be raised, thereby raising the brake pipe exhaust valve 46, and venting the brake pipe pressure direct to the atmosphere.

The sudden reduction of brake pipe pressure quickly reduces the pressure in chamber 40a of the service section, thereby opening the valve 55 and causing a corresponding reduction in chamber 85 of the change-over valve through pipe 10. The pressure in chamber 85 of the change-over valve will then be reduced faster than the service reservoir pressure can flow through the restricted opening of valve 95, and as the upper chamber 90 is in direct communication with the service reservoir through ports 14, the high service reservoir pressure above diaphragm 88 forces the diaphragm down. This movement closes valve 95 and opens valve 103. The closing of valve 95 seals the service reservoir from the brake pipe, and the opening of valve 103 releases the service reservoir to chamber 41 of the emergency section valve 103a and through pipe 106.

This action occurs instantly and diaphragm 39 is raised by the decreasing brake pipe pressure, in chamber 40, and the increasing service reservoir pressure in chamber 41, thereby raising the yoke 55b. The upward movement of the yoke closes vent valve 51 and opens valves 60 and 60a. The opening of valve 60 releases the auxiliary reservoir to chamber 41 through pipe 41c. From chamber 41 the air from both the service and auxiliary reservoirs flows past valve 60a through pipe 41d to chamber 25 and the brake cylinder.

The operation of the parts just described quickly reduces the brake pipe pressure, and assures a quick and positive emergency application of the brakes throughout the train.

Valve 46 will remain open until the entire brake pipe pressure has been reduced sufficiently to assure an emergency application. The length of time depends upon the time required to vent the pressure in chambers 81 and 82, above diaphragm 63, to chamber 39a. This is determined by the size of the opening through the restriction screw 69. When the pressure in chamber 81 has been reduced to an equality with that in chamber 39a, spring 76 raises diaphragm 63 and spring 77 closes valve 46.

A release of the brakes after an emergency application is affected by raising the brake pipe pressure above the

pressure in chamber 4 which, in emergency, is equal to brake cylinder pressure. When the pressure in the brake pipe and in chambers 2 of the service section and 40 of the emergency section is raised above the equalized pressure in chambers 4 and 41, diaphragm 39 will be depressed, closing valves 60 and 60a, and opening vent valve 51. This releases the pressure in chamber 41 to passage 61 and the atmosphere, and the upward movement of diaphragm 3 opens exhaust valve 35, releasing the brake cylinder pressure to the atmosphere.

When the brake pipe pressure has been raised in chamber 85 of the change-over valve above the service reservoir pressure in chamber 90, diaphragm 88 will be raised to its normal position in which it is held by spring 18, and the service reservoir will again be charged.

Should an emergency application be desired following a service application, and service reservoir and brake pipe pressures are below the emergency brake cylinder pressure, valve 103a will prevent the emergency brake cylinder pressure from returning to the service reservoir.

TRAIN ACCIDENTS IN JULY¹

The following is a list of the most notable train accidents that occurred on the railways of the United States on the month of July, 1917:

Collisions			Kind of accident	Kind of train	Killed	Inj'd
Date	Road	Place				
7.	Louisville & N.	Cave City.	bc	F. & F.	1	6
11.	Boston & A.	N. Wilbraham.	xc	F. & F.	0	3
14.	Staten Island	St. George.	rc	P. & F.	0	1
16.	Louisville & N.	Nashville.	rc	F. & F.	1	0
16.	Southern Pacific	Rosamond.	xc	P.	0	2
17.	Chicago R. I. & P.	Peoria.	xc	P.	2	4
28.	Erie	Passaic Junction.	rc	F. & F.	1	4
29.	Balt. & Ohio	Euretta, W. Va.	bc	P. & F.	1	3

Derailments			Cause of derailment	Kind of train	Killed	Inj'd
Date	Road	Place				
1.	Southern	Toccoa.	.....	P.	.....	.....
5.	Balt. & Ohio	Shippensburg.	d. track	P.	1	1
8.	Phila. & Reading	Granogue.	unx	P.	0	14
8.	Nash. C. & St. L.	Dalton.	unx	P.	0	22
10.	Boston R. B. & L.	Winthrop.	.....	P.	1	8
17.	Southern	Caldwell's.	malice	P.	2	5
18.	Texas & Pacific	Victoria.	.....	P.	1	5
18.	Louisiana & N. W.	Homer.	d. track	P.	0	14
20.	Atlantic C. L.	Hope Mills.	d. track	P.	0	8
28.	Houston & T. C.	Bryan.	.....	P.	1	2

Other Accidents			Kind of accident	Kind of train	Killed	Inj'd
Date	Road	Place				
28.	Penn.	Edgewood Park.	fire	F.	.....	.....
30.	Central N. J.	Galilee.	fire	F.	1	1

The trains in collision near Cave City, Ky., on the 7th were northbound freight No. 74, second section, and southbound freight No. 15. Both engines and 10 cars were wrecked. One fireman was killed and six trainmen were injured. The cause of the collision was the overlooking of the schedule of train No. 15 by the men in charge of the northbound train.

The trains in collision near North Wilbraham, Mass., on the 11th were eastbound freights. The leading train was in charge of Conductor Carpenter, with engine 1203; it was moving slowly from a siding to the main track and was run into at the side by the following train. One locomotive and 15 cars were wrecked. One engineman, one fireman and one brakeman were slightly injured. The collision occurred about 4:25 p. m. Carpenter's train had been standing on a siding. After a passenger train went by, Carpenter, who was out ahead of his train, said he looked back along the track, which is straight for two miles, saw

¹Abbreviations and marks used in Accident List: xc, Rear collision—bc, Butting collision—xc, Other collisions—b, Broken—d, Defective—unf, Unforeseen obstruction—unx, Unexplained—derail, Open derailing switch—ms, Misplaced switch—acc, obst., Accidental obstruction—malice, Malicious obstruction of track, etc.—boiler, Explosion of locomotive on road—fire, Cars burned while running—F. or Pass., Passenger train—F. or P., Freight train (including empty engines, work trains, etc.)—Asterisk, Wreck wholly or partly destroyed by fire—Dagger, One or more passengers killed.

nothing coming, and signalled to come ahead. He said he heard a sudden shrill whistle and suddenly a fast freight (engine 1020) loomed up. All hands then tried to stop, but the front end of 1203 projected eight or nine inches over the main track. It appears that Carpenter had opened the switch after the other freight train had passed the last preceding block signal and then did not wait a sufficient time to see if there were a train in the block, approaching. In the collision engine 1020 hooked the 1203 just back of the cylinder and dragged it out on the main line. The 1020 glanced from the heavier 1203 and turned over on its side; and the leading cars of its train piled up, leaving the 1203 still on the rails. Seven cars of hogs were crushed, about 300 animals getting out alive. Four cars of coal made the usual immovable pile, and the wreck blocked both main tracks until 11 p. m.

The trains in collision near St. George, N. Y., on the 14th were a northbound passenger train consisting of a locomotive and three cars, and a heavy freight engine without train, the freight engine running into the rear of the passenger. The freight engine had no persons on it, having been started, in some way not explained, by a repair man in the yard at Clifton; and, running at about 40 miles an hour, it struck the passenger train moving at about 20 miles an hour. The engineman of the passenger train shut off steam and applied the brakes; but the engine at the rear pushed the train about a mile and finally off the track at the St. George tunnel. One employee riding in the baggage compartment, at the rear of the train, was injured and was sent to a hospital; but the other passengers, 35 of them, who in a few cases were slightly injured, were all sent to their homes.

The trains in collision at Nashville, Tenn., on the evening of the 16th were southbound freight No. 73, first and second sections. The first section had been stopped by a block signal and was run into at the rear by the following section. The conductor, in the caboose, was killed. Responsibility for the collision is charged against the flagman of the first section, who did not properly protect his train.

The train involved in the collision at Rosamond, Cal., on the 16th was an eastbound passenger. A string of six loaded freight cars, which escaped control at a point 14 miles west ran down the grade and into the rear of the passenger train and wrecked one car, a sleeping car. Two other cars were overturned. One passenger and one trainman were slightly injured. The runaway cars passed over a derail, which failed to stop them because it broke (by reason of defective metal) at the point of contact with the wheel flange.

The train involved in the collision at Peoria, Ill., on the 17th was westbound passenger No. 201. The train ran through a misplaced switch and collided with a yard engine standing on a side track. Two employees were killed and one seriously and three slightly injured.

The trains in collision at Passaic Junction, N. J., on the morning of the 28th were eastbound freights. The leading train had just begun to move, after a stop, when the following train ran into the caboose, wrecking the caboose and overturning the engine. Eight cars were damaged. A drover in the caboose of the leading train was fatally injured and 4 trainmen were less severely hurt.

The trains in collision at Eureka, W. Va., on the morning of the 29th about 3 o'clock were westbound passenger No. 77 and eastbound freight No. 98, second section. One fireman was killed and three other trainmen were slightly injured. The freight, drawn by two engines, had run past a meeting point and encroached on the time of the passenger train. It had been stopped and the flagman had gone forward a short distance but there was a dense fog, and the flagman had not had time to go far enough to protect his train.

The train derailed near Toccoa, Ga., on the 1st of July

was northbound passenger No. 38. The engine and first three cars were ditched.

The train derailed near Shippenville, Pa., on the 5th was a northbound passenger. The engine fell down a bank and the engineman and fireman were scalded, the former fatally. No passengers were injured. The cause of the derailment was distortion of rails by solar heat.

The train derailed near Granogue, Del., on the 8th was southbound passenger No. 12. The engine fell down a bank and was overturned. Two trainmen and 12 passengers were injured. The cause of the derailment was not determined.

The train derailed near Dalton, Ga., on the 8th was southbound passenger No. 93. Fifteen passengers and five trainmen were injured. The cause of the derailment was not determined.

The train derailed on the Boston, Revere Beach & Lynn at Winthrop, Mass., on the 10th was a southbound passenger. One passenger was killed and eight were injured. The derailment was caused by the moving of a movable point frog, beneath the moving train, by a student signalman, though it appears that the regular signalman was in the cabin. Electric track-circuit locking, which would have prevented the movement of the frog under the train, is being installed, but is not finished.

The train derailed near Caldwell's, N. C., on the 17th about 5 a. m. was northbound passenger No. 26. The whole train was overturned and the engine and cars fell down a bank. The fireman and one passenger were killed and the engineman, one mail clerk and three passengers were injured. The derailment was due to a loose rail from which the angle bars and 11 spikes had been maliciously withdrawn.

The train derailed near Victoria, La., on the 18th was a special passenger carrying soldiers. One soldier was killed and five were injured. Four coaches were overturned.

The train derailed on the Louisiana & North West near Homer, La., on the 18th was a northbound passenger; two coaches were overturned and 14 passengers were slightly injured. The cause of the derailment was spreading of rails.

The train derailed near Hope Mills, N. C., on the 20th was southbound passenger No. 89. Running at about 20 miles an hour, the first car behind the engine was derailed by the weakening of the roadbed by a washout and six cars altogether were ditched. Several passengers and three trainmen slightly injured.

The train derailed near Bryan, Tex., on the 28th was a northbound passenger. The engine and first two cars were overturned and the fireman was killed. Two other trainmen were injured.

The train involved in the accident at Edgewater Park, N. J., on the 28th was a westbound freight. The cars in the train were set on fire by burning gasoline spilled from tanks in a motor truck which was driven into the locomotive of the train at a highway crossing. The gasoline, being lighted presumably by contact with the locomotive firebox, ran along the ditch at the side of the track and set several cars on fire. Sometime after the wrecking of the truck a second tank exploded and did serious damage within a radius of 300 ft. Two cars and the railroad freight house were burned up. The driver of the motor truck was injured, and the explosion caused the death of one and the injury of 14 other men, most of them firemen, fighting the flames. This crossing has an automatic warning bell which is said to have been ringing; the train was moving at about 20 miles an hour.

The train involved in the accident near Galilee, N. J., on the 30th was a southbound passenger. The train struck an automobile truck on a highway crossing causing an explosion of gasoline, the engine and the two cars of the train were at once in flames. One coach was burned up, as was

also the passenger station. The engineman and fireman were severely burned; the engineman fatally. The driver of the wagon was killed.

Electric Car Accidents.—Seven accidents to electric cars occurred in the first five days of July, and were reported in the *Railway Age Gazette* of July 13, page 77; in these accidents the number of persons reported killed was 18 and of injured 185. At Montclair, N. J., on the 17th an electric car filled with a picnic party ran away down a steep grade and 60 persons were reported injured. This car was started by accident, or by the action of some mischief maker, while the conductor and motorman had got off for the purpose of assisting another car which was in trouble.

Canada. In a butting collision of passenger trains on the Canadian Northern near Villeneuve, Alberta, 21 miles west of Edmonton, July 30, five passengers were killed and a large number injured. The reports indicate that the collision was due to a mistake in a train order or to the non-delivery of an order.

RAILROADS HAVE SUBSCRIBED FOR \$48,750,000 OF LIBERTY LOAN

The railroads which are now stretching every muscle to secure Liberty Bond subscriptions among their employees and to advertise the loan to their patrons, are leading the way themselves by having subscribed up to Wednesday evening for almost \$50,000,000 in bonds for their own treasuries.

In last week's issue of the *Railway Age Gazette* a list was given of 11 roads that had subscribed \$37,250,000 in the Second Loan, and note was made on another page that the Pennsylvania had taken \$5,000,000, a total for 12 roads of \$42,250,000. During the past week additional subscriptions have been recorded of \$3,500,000 by the Chicago & North Western \$2,500,000 by the Chicago, Milwaukee & St. Paul and \$500,000 by the Virginian, making the total up to Wednesday night of \$48,750,000.

The Liberty Loan Committee on Railroads headed by A. H. Smith, president of the New York Central, has received assurances that nearly every important road in the country is offering to assist its employees to take bonds on the partial payment plan. Railway employing officers the country over are going after it strong with personal talks, shop meetings and local conferences. A special drive is being made for those who did not subscribe to the first loan and extra efforts are being made to assist those who took bonds in the first Liberty Loan and who are to that extent still tied up on payments.

On some railroads an arrangement has been made whereby banks will take the bonds in the first issue not yet paid for, the employee's partial payments on the bond being applied instead on bonds in the second loan.

"Do you believe in insurance?" says the appeal sent out by the General Liberty Loan Committee of the Central of Georgia, headed by W. B. McKinstry, auditor. "This question," the appeal continues, "will be affirmatively answered by a large majority of Americans today, when practically every known risk may be protected by insurance of some character, but the danger which confronts our country can be averted by only one form of protection—men and more men. Thanks to the patriotism of Americans, as a whole, the men are or will be available to protect our homes and shores from the invasion of the Prussian hordes, but those men require transportation, clothing, equipment and food, and those necessities may be secured only through one medium—*money*! To cover this risk, Uncle Sam is now offering a form of insurance in policies of variable amounts, which he calls *Liberty Bonds*. These policies are of the single premium variety, fully paid up, non-assessable and fully participating. Non-assessable, in that they are not

subject to taxation and fully participating in that they pay interest until their maturity. These policies are backed by a reserve represented by the strength of the government of the United States and are strictly mutual in that each purchaser is a part of the government, and by his patriotism and loyalty can guarantee the validity of his policy.

"How much insurance will you buy?"

THE DAYTON BOOK UMBRELLA

A "book umbrella" is a small rectangular glass box, open at the underside to permit the user to insert his hand, designed to hold a car record book so that the number taker, working outdoors, can carry on his work conveniently in spite of rain or snow. The umbrella needs little description other than that afforded by the illustration, showing a man entering on his book Big Four car No. 6,385. It is 6 in. square, light, strong and durable, and is fitted with a strap by which the clerk can suspend it from his shoulder. Clips are provided at top and bottom by which a book, where a book is used, can be held open at the desired page.

An "umbrella" of different shape is made to hold loose flat sheets, these being held by clips, at the upper end,



The Dayton Book Umbrella

working the same as the ordinary clip used in offices. This design is 11 in. wide 13½ in. long and 5¾ in. high.

When required the umbrella is equipped with a light for night use. This is fixed at the upper end of the box so as to illuminate both the writing surface within the box and the number on the side of the car. The light, electric, is, of course, safe for use around cars containing inflammable freight.

The umbrella is made by the Dayton Manufacturing Company, Dayton, Ohio. It has been used in the yards of the American Rolling Mills for several years and is in experimental use on the Baltimore & Ohio, the Big Four, the Southern and other railways.

Bridge and Building Association Convention

Abstracts of Committee Reports and Papers Presented
at the Meeting Which Was Held This Week in Chicago

THE twenty-seventh annual convention of the American Railway Bridge and Building Association was held at the Sherman Hotel, Chicago, on Tuesday, Wednesday and Thursday of this week. The attendance was very encouraging, considering the unusual conditions obtaining in the country at the present time. The discussions indicated an active interest in the reports and papers presented, many of which were of particular application to the problems now confronting the members of the bridge and building staffs on American railways.

The officers for the past year were: President, C. E. Smith, consulting engineer, St. Louis, Mo.; first vice-president, E. B. Ashby, consulting engineer, Lehigh Valley, New York City; second vice-president, S. C. Tanner, master carpenter, Baltimore & Ohio, Baltimore, Md.; third vice-president, Lee Jutton, division engineer, Chicago & North Western, Madison, Wis.; fourth vice-president, F. E. Weise, chief clerk, engineering department, Chicago, Milwaukee & St. Paul, Chicago, and secretary-treasurer, C. A. Lichty, purchasing department, Chicago & North Western, Chicago.

The convention was called to order by President Smith at ten o'clock, Tuesday morning; addresses of welcome or other opening exercises were dispensed with.

President Smith called attention to the trying conditions under which the bridge and building men are now laboring and to the decision of the executive committee to hold the convention to assist the men in their work. The report of the secretary-treasurer showed a balance on hand of \$958.

DELIVERY OF WATER TO LOCOMOTIVES

Water is delivered to the tender of a locomotive either directly from a storage tank or through a pipe line and a discharging device, commonly called a water column, stand-pipe or penstock. Penstocks or water columns have taken the place of tank spouts to a large extent in modern installations of railway water stations, largely because they permit a more convenient location of the tank and also the taking of water at several points. The desirable qualifications in a penstock are a rapid delivery of water with low frictional resistance to the flow, and a valve movement that may be handled and controlled easily without water hammer. The construction of the penstock should be such as to permit it to be operated easily and to be economical in maintenance. The importance of the time element in train service requires that the delivery of water to the tender be made as quickly as possible. For this reason the waterways should be of ample size and the flow of water through the column as direct as possible.

The following paragraph on the discharging capacity of penstocks is taken from the University of Illinois bulletin No. 21:

"It would seem that with a short line of pipe from the supply tank a velocity through the water column of 12 or 15 ft. per sec. may be considered as the maximum desirable for ordinary conditions, and for longer lines the limiting velocity should be smaller. For a long line of supply main the limit of allowable velocity would be perhaps as low as 8 ft. per sec. It would seem, then, that 3,000 gal. per min. for an 8-in. water column, 4,000 gal. per min. for a 10-in. water column and 6,000 gal. per min. for a 12-in. water column may perhaps be considered to be the limit of desirable flow through water columns. It would also appear that a loss of much more than 20 ft. of head for the discharges just men-

tioned may be considered to be excessive, under conditions of ordinary tank supply."

The principal advantages in the use of pen-stocks or standpipes are that they permit the selection of a permanent location for a tank remote from the tracks and out of the way of future construction, and that they make it possible to deliver the water to locomotives from a single storage tank at as many different points as may be desired.

It is important that supply lines leading to penstocks be designed properly. A penstock operating under a low head should have a larger pipe than one working under a relatively high head. The same thing is true of a long pipe line. If the maximum delivery is desired the supply line should be at least two inches larger than the penstock. Where several penstocks are installed in a busy yard or where more than one engine will take water at the same time, the supply line should be large enough to supply water to more than one penstock without any material decrease in the delivery. A 12-in. penstock with a 14-in. main 1,000 ft. long, will deliver 4,000 gal. per min. with approximately the same loss of head as a 10-in. penstock with 1,000 ft. of 12-in. main delivering 2,750 gal. per min. or an 8-in. penstock with 1,000 ft. of 10-in. main delivering 1,750 gal. per min. A distance of 20 ft. from the top of the rail to the bottom of the tank is generally accepted as the economical height of tower for tanks.

The proper location of penstocks is an important factor in the economical delivery of water. At engine terminals they should be located conveniently so that an engine may take water along with other supplies, such as coal, sand, etc., without any switching or back-up movement. Penstocks serving yard engines should be so located that they will not interfere with the movements of road engines handling trains or with the movements of engines to and from the round-house. In a large yard it is important that the engines do not block the switching lead when taking water, the proper location of penstocks being at each end of the yard, where engines may take water after receiving their trains. In a large yard this may mean a heavy expense for pipe lines, but where there is a frequent train movement the expenditure will be justified by cutting down the terminal delay and facilitating the movement of trains. Where the distance from the main supply tank is very great as for example at an isolated penstock at the far end of a station or yard layout, it will frequently prove more economical to locate an auxiliary tank opposite the penstock, as the supply would be taken by gravity from the main tank through a much smaller pipe than if the engines were supplied direct from the main tank through a penstock main.

An important feature in the economical delivery of water to locomotives is the prevention of waste while taking water. This is sometimes due to carelessness on the part of the fireman, but more often is the result of faulty fixtures and improper design of the manhole on the engine tank. The great range in the height of manholes above the rail makes it a very difficult matter to provide fixtures that may be adjusted to the varying heights unless the manhole is of liberal size. This is especially true of tank spouts. The manhole should be rectangular in shape and not less than 16 in. wide and 30 in. long. It will be found that when taking water with a spout without lateral adjustment, the spout will be at the outside edge of the manhole on high tenders and near the inside edge on low tenders. Thus it will be seen that it is impossible to avoid a waste of water

with round manholes unless they are of uniform height above the rail.

(C. R. Knowles, superintendent of water service, Illinois Central, Chicago, is chairman of the committee presenting this report.)

DISCUSSION

The relative merits of the telescopic and rigid types of spouts created active discussion. B. F. Pickering (B. & M.) stated that he has found the telescopic spout more expensive to maintain than the rigid type and that, as a result, he has replaced several of the telescopic spouts with rigid ones. Several members reported that their experience has been the reverse and that the telescopic spout was more economical in maintenance and in water. Mr. Bowers (Pa. Lines) stated that there are 60 rigid spouts in service on the Pittsburgh division and that, although road engines are not required to cut off their trains, no trouble is experienced.

ERECTION OF GIRDER SPANS WITH LITTLE INTERRUPTION TO TRAFFIC

Bridge work must be planned to interrupt traffic as little as possible, remembering that, when trains are stopped on account of a bridge not being ready, a portion of the plant is shut down and the output is stopped until trains are allowed to proceed.

In the erection of railroad bridges under traffic, one of two general methods must be selected for each particular case. The old bridge must be taken out in small portions and the new bridge erected in the same manner, or the old bridge must be taken out and the new one put in by handling one entire span in one operation. The first method is almost always selected when the traffic over the bridge is quite heavy, making it impracticable to suspend traffic long enough to permit the taking out of an entire span. There are times, however, when this method cannot be followed even in the case of large structures and on heavy traffic lines. In such cases falsework cannot be put in for the erection of bridges in sections and some method must be found to put in one entire span at one operation. When bridges are erected by putting in a portion of a span at a time it is necessary to provide a rather large amount of falsework and to arrange this falsework so that the work of changing from the old bridge to the new can be stopped at any point in order to let trains over when they reach the bridge.

The method of putting in bridges by changing out one entire span at a time is usually selected when traffic conditions are not severe. It has the great advantage of requiring little or no falsework. As has been mentioned above, however, this method must be used, no matter what the traffic conditions are, when it is impossible to put in falsework, such as over busy navigable streams or railroads. Almost always the new span is assembled and riveted alongside the span it is to replace. This necessitates the erection of one falsework bent at the end of each pier and abutment to receive the new span in its temporary position. This is usually put on the down-stream side; although if local conditions require it may be put on the up-stream side. Almost always the ties and rails are put on the new span in its temporary position so as to avoid doing that work after the span is moved into its permanent position. Before the new span is moved it is, of course, necessary to dispose of the old span. If time will permit, the best method is to cut the old span apart and lift it out with a derrick car. If, however, time will not permit, falsework bents must be erected on the opposite side of the piers and abutments from the new span so that the old span can be moved out to one side preliminarily to the moving in of the new span. If the weight of the new span and the capacity of the derrick will permit, the new span should be assembled on the ground at the end of the bridge and then carried bodily into place. The old span, of course, can be removed in the same way. When conditions

will permit this method of erection no falsework of any kind is needed.

When through truss spans are replaced with deck-plate girder spans, it is almost always possible to set the girder spans inside of the truss spans by cutting down the masonry and removing the lower laterals and the floor system of the truss spans. Under proper conditions the girders can be lowered with rigging suspended from the top chords of the old trusses. This is a very economical method of erection, but it can be used only on lines where the traffic is comparatively light.

(Lee Jutton, division engineer, C. & N. W., Madison, Wis., is chairman of the committee.)

DISCUSSION

The discussion brought out a number of interesting methods developed by members to renew bridges without interfering with train movements. These consisted mainly in modifications of methods described by the committee.

W. F. Strouse (B. & O.) made a progress report on repairing and strengthening old masonry, giving replies of several roads to inquiries concerning the advisability of grouting old masonry and other expedients. In the discussion C. E. Smith described the conditions existing on the Missouri Pacific ten years ago when the piers or abutments were moving under 150 bridges on line. These substructures were all strengthened by concrete without a single failure. Other members told of different ways in which they had strengthened structures.

PAINT AND ITS APPLICATION TO RAILWAY STRUCTURES

Wooden and frame structures require the greatest amount of attention and expense, for the only practical method to protect them from decay or to improve their appearance is to apply a preservative coating of high-grade paint. Unpainted wood will darken, warp, become fuzzy and damp and finally decay, but it may be protected permanently from these effects through the occasional use of high-grade paints. Paint acts as a preservative on wood because it closes the openings and pores and so prevents the entrance of decay-producing organisms.

The different species and types of woods vary greatly in their makeup, porosity and compactness, all serious points when the initial or priming coat of paint is applied. White pine and poplar, being soft, close and straight-grained woods, comparatively free from shrinkage, possess good absorbing qualities and a ready affinity for paint, while yellow pine and hemlock are hard, coarse-grained, of very resinous and uneven structure, varying from a soft, porous and quick-absorbing, to a very hard and fast surface into which paint cannot penetrate.

The first class requires that the priming coat be reduced to a medium thin consistency, carrying very little turpentine. The second demands a thinner mixture, carrying from 25 to 40 per cent of turpentine.

Nearly every railroad has adopted a certain standard of painting, both as to method and colors, including the formulas composing the different mixtures. These mixtures, called "standard colors," are usually bought in the open market, although some roads have paint-mixing departments of their own. In a great many cases this material is brought ready for application, thus leaving no room for adjustment to fit the different surfaces, and, of course, is applied as received.

The act of priming or first-coating is the most important operation in painting, although in many cases it is not so considered, which is a vital mistake. The priming coat must fill and satisfy the surface, and so create a foundation upon which all future coats can be successfully applied. It must carry sufficient linseed oil not only to satisfy the surface, but must also bind and hold the pigments to this surface. Priming mixtures must also carry the proper amount of turpentine to cause penetration and assist in forcing the

oil and pigment into the surface by absorption. The formation of the pigment must be such as to allow of penetration into the surface, and, above all, must be well and evenly spread and brushed into the surface.

The prime coat should not stand longer than is necessary to harden the film thoroughly and allow for full absorption and penetration. If allowed to weather, it will become porous and absorb the life of the second coat and there will not be sufficient binder left to adhere to the surface properly.

Usually, railway standards and specifications provide whether two or three coat work is desired, but it should be borne in mind that in trying to finish in two coats over dark, hard and pitchy lumber, especially with light shades, success at some future time may be sacrificed. In the second and finishing coating of structures, care must be exercised in spreading the paint evenly and clean and avoid sags and curtains.

Shingle roofs, at least on the better class of buildings, ought to be painted with some high-grade material, not only to preserve the roof, but to improve the appearance of the structure as well. Moreover, a valuable characteristic of high-grade paint is its resistance to fire. On brick and stone structures, with the exception of window and door frames, sash, doors, gutters and down spouts, no painting is really necessary. The method and color for these items is generally the standard in vogue on each system.

On steel and steel-covered structures, the primer or first coat must be selected judiciously. If the standard finishing color for these structures is of a carbon or lampblack base, it would be wrong to use such a paint for the ground coat applied directly upon the steel. This primer should be a properly prepared rust inhibitive coating, from basic pigments, such as red lead, sublimed blue lead, oxide, chromates or the like inhibitive materials. Over such a ground after proper drying time has elapsed, carbon or other standard paints may be successfully applied. Practical tests have proven that ultimate economy is effected by using only the highest grade of the proper kinds of paint for metal protection.

(Chas. Ettinger, master painter, Illinois Central, is chairman of the committee.)

DISCUSSION

In reply to a question the chairman of the committee stated that the smoke and soot created more severe conditions along railways than elsewhere. G. M. Hoffman, Philadelphia & Reading, stated that the practice of that road is to wash buildings thoroughly and then apply one coat of paint every two, three or four years, according to conditions.

FIREPROOFING ROOFS OF WOODEN BUILDINGS

Wooden shingles were almost universally used in the earlier days of railroads for the covering of all ordinary buildings having roofs with a pitch greater than one-fourth, and while they are rapidly losing favor there are certain localities where they will be used for some time to come owing to their moderate cost, light weight, low heat conductivity, wide application and durability. When shingles get old they become a considerable fire risk and are set on fire readily by sparks from passing locomotives. While there are a number of preparations on the market to make them fire-resisting to a considerable degree, they are likely to be neglected beyond the length of time the preparation remains effective and in this way the roof again becomes a fire risk.

Coverings prepared by saturating felt with asphalt, sometimes termed "composition roofings," or "prepared roofings," are sufficiently fire-resisting for all practical purposes, and on buildings which have a pitch of one-fourth or greater, and where appearance need not be taken into consideration, such material laid from rolls in large sheets with 2-in. lap joints may answer the purpose as well as anything. Most wooden buildings with flat roofs or roofs with slight pitch

are best covered with tar and gravel or metal roofs, the former being generally used on main buildings, and tin in sheets on porch roofs and other places where tar and gravel would be objectionable.

Shingles made from a composition of cement, asbestos, etc., having various trade names are used to a considerable extent and they present a good appearance.

Slate shingles have been in use many years, and for roofs having more than a moderate pitch they are perhaps as durable as anything on the market, or much more so. In cold climates where the pitch of a slate roof is less than one-third or one-fourth, it often proves troublesome.

Tin shingles are used to a considerable extent on some roads and give good satisfaction. When secured with the "bar lock" it is impossible for a tin roof to leak during its lifetime. These shingles are manufactured in various ornamental styles and make a neater appearance than any other kind of ordinary metal covering. Their life on railroad buildings depends entirely on the kind of metal and its protective coatings—tin, galvanizing, paint, etc.

The ordinary tar-and-gravel roof is probably more extensively used on roofs having a slight pitch than any other kind of covering, and its wearing qualities are so well known as to require little comment. Its life depends solely upon the quality of the materials used and their application. Roof coverings which require protective coatings are at a decided disadvantage, for the reason that they are liable to be neglected beyond the time when the coating remains effective when the covering suffers and may result in premature loss.

(C. A. Lichty, inspector, purchasing department, C. & N. W., Chicago, is chairman of the committee.)

DISCUSSION

Doctor Herman Von Schrenk described the results of ten years' investigation of methods of fireproofing wooden roofs and of the development of fire retarding paints. He also showed an exhibit of sample roof sections.

UNIFORM VERSUS DIFFERENTIAL RATES OF PAY

By E. T. Howson

Engineering Editor, *Railway Age Gazette*, Chicago, Ill.

The bridge and building department, in common with other branches of the maintenance of way department, is experiencing serious difficulty at present in retaining adequate forces. The competition for men has become unusually keen, particularly since July 1 of this year, when the construction of the cantonnements and other concentration camps for military forces called for large numbers of carpenters and other skilled mechanics at wages far above those which the railroads were paying.

The principle upon which wages in the maintenance of way department are based is that of a flat or uniform rate for every man. This in turn presupposes that all men are worth equal amounts or that they are of equal ability and efficiency. It is primarily because of this foundation that difficulty has arisen in retaining forces. Furthermore, the railways have not kept pace in the last few years with the rapid increase in the wages of skilled workmen in other industries. In many cases it has been considered impracticable to raise the wages of the large numbers of men employed because of the expense involved, while in others the disinclination to disturb relations with the wages of other employees has tended to hold all of them stationary. The result has been that the outside industries have been able to attract the best men, leaving the less efficient to the roads.

One suggestion which has been made to meet this condition in the bridge and building department is that of establishing different rates for the men in the gangs, which rates could be so arranged that while the total payroll for the gang would not be increased, the men would be paid in proportion to their experience. A graduated rate can also be

held out to the newer men in the gang as a reward for experience and as an incentive for them to put forth their best efforts.

One objection to this system which has very largely retarded its adoption is the fact that the establishment of a higher rate for one group of men disturbs relations with other groups. An even more serious objection to the differential rate is the tendency of some foremen, and not a few supervisors, to use such a differential as a means of securing higher wages for as many of their men as possible without regard to their merit or the purpose of the differential.

In spite of these handicaps, a differential wage rate adjusted to the merits of the different classes of employees has much to commend it, particularly at the present time when labor is so scarce and so nomadic. If fairly and intelligently administered, it will benefit a road by enabling it to meet the competition of industries to a greater extent than is now possible, while it holds out the promise of reward to the younger and less experienced but ambitious workmen.

This is not an untried theory, for at least one road; the St. Louis-San Francisco adopted the plan of paying differential rates for its bridge, building, painting and concrete forces over a year ago, with excellent results. The officers in charge of this branch of maintenance work stated that if this plan had not been in effect much of this work, now completed, would have had to have been left undone because of lack of forces. The statement is further made that this plan has been shown to be economical to the road.

DISCUSSION

G. W. Andrews (Baltimore & Ohio), Fred Burrell (Chicago & North Western) and others, reported excellent results from a sliding scale of wages.

PRESENT SITUATION AS TO WATER SERVICE MATERIALS

By C. R. Knowles

Superintendent Water Service, Illinois Central.

Although a very conservative estimate of the increased cost of all materials used in maintenance of way work has been given as 30 per cent, I think we can safely say that with few exceptions, this figure will come nearer representing the minimum increase in the cost of waterworks materials, many items having increased several hundred per cent. The unprecedented prices and the uncertainty of delivery have created conditions which make it very necessary to employ methods that will help to conserve materials used in waterworks construction and maintenance, especially with such materials as are particularly difficult to secure.

From the present outlook some relief appears in sight as regards prices of certain materials, the price of cast-iron pipe having dropped \$15 per ton on October 1; although with the government and foreign requirements, in addition to the greatly increased domestic demands for materials of all kinds, we cannot hope for much relief in the near future, as far as deliveries are concerned.

While all materials have advanced in cost, the increase has been more marked in iron and steel products, and articles manufactured from brass, copper and other semi-precious metals. Boilers have doubled in cost with indefinite dates of delivery on those built to specifications. Steel tanks of all kinds have advanced from 100 to 150 per cent, tank hoops from 75 to 100 per cent, steam pumps from 40 to 50 per cent and oil engines 30 to 40 per cent, with deliveries from 3 to 9 months in the future, depending on the size of the units.

All stocks of steel and wrought-iron pipe have been depleted and it is difficult to even get a quotation on a definite date of delivery on large pipe. Delivery on cast-iron pipe has been fairly good, although the price has more than trebled in two years. We are laying cast-iron pipe today that

ranges in cost from \$18.50 to \$60 per ton, while the lead used in making the joints has advanced from \$3.75 to \$11 in two years.

The following table shows the range in cost of cast-iron pipe from 1912 to date.

Year	1912.....	Approximately	\$20.65 per net ton
Year	1913.....	Approximately	20.35 per net ton
Year	1914.....	Approximately	18.50 per net ton
Year	1915.....	Approximately	18.60 per net ton
Year	1916.....	Approximately	25.00 per net ton
January, 1917.....	Approximately	32.75 per net ton	
July, 1917.....	Approximately	49.30 per net ton	
October 1, 1917.....	Approximately	60.00 per net ton	

It is along the line of salvaging old pipe lines that the greatest good may be accomplished in conserving waterworks materials. The salvage of cast-iron pipe is almost 100 per cent. Except for the cost of removal, a cast-iron line is of as much value when taken out of the ground after years of service as when it was laid. It is true that a year ago, with cast-iron pipe at \$18 per ton, the cost of removal would in many cases have almost equaled the cost of new pipe, but with pipe at \$60 per ton the removal of old lines is a paying proposition. In many instances wrought-iron pipe may also be salvaged to good advantage.

The saving effected by the conservation and salvage of second-hand material is not confined to pipe alone, but includes all classes of materials. Tank hoops may be repaired and used on other tanks. Sound staves and bottom plank may be utilized in the construction of smaller tubs; valves and fittings may be repaired at a small cost and made to answer for new; rubber pump valves may be faced off and used again; pump packing, worn too small for one pump, may be used in a pump requiring smaller packing.

In many cases standards may be revised, substituting material expensive and difficult to secure with that less expensive and more easily obtained. For example, we have changed the design of our water-column pit, eliminating about 3,000 lb. of castings and several hundred pounds of reinforcing bars, and I believe we now have a better designed pit than we had before. The difficulty in securing steel plates and the great increase in the cost of steel tanks have forced many railroads which had practically adopted the steel tank as standard to return to wood. The high price of steel has also stimulated the interest in concrete tanks and there is great activity along this line. The high cost of cast and wrought iron pipe has caused many railroads to give serious consideration to substituting wood stave for iron pipe.

A great deal may be accomplished in conserving materials by overhauling scrap piles and reclaiming second-hand material, also by cleaning out shelves and the pump houses of the ever-present accumulation of globe valves, fittings, etc., held for a fancied emergency that never occurs. Scrap has advanced in price to such an extent that in some instances the scrap value of an article is in excess of its cost new a few years ago, consequently scrap should be kept cleaned up and forwarded promptly to the storehouse in order that the scrap may be disposed of to the best advantage.

It has been truly said that "The ways in which material and supplies are wasted on a railroad are as many as the number of persons in its employ," and if we may learn the lesson of economy in the use of materials from the present situation it will not have been without its good effect.

DISCUSSION

The discussion of steel, timber and water service materials brought out many descriptions of bridges strengthened to avoid use of new material. I. L. Simmons (Chicago, Rock Island & Pacific) urged that more attention be given to the question of how present structures can be carried over rather than be renewed. Old spans can frequently be strengthened at small expense.

ORGANIZATION AND OPERATION OF BRIDGE AND BUILDING MATERIAL YARDS

By H. C. Pearce

General Purchasing Agent, Seaboard Air Line.

The location of bridge and building material yards must be governed very largely by the geographical location of the property. In the southeast it has been an open question in the past whether it was either economical or necessary to have large general distributing bridge and building yards. Most of the larger systems in the southeast have a large number of mill operations on their own lines, particularly in Georgia and Florida, and lumber has been cheap. Under these conditions arrangements can be made with certain mills to take care of certain territories. This plan, however, leaves many loose ends, and incurs many concealed losses. It is not, and never will be, entirely satisfactory, but the direct saving is so considerable that it must be considered under certain conditions.

On the Pacific Coast a large portion of the lumber comes by water. This makes it desirable that the material yards be located sufficiently close to the docks and wharves to use switching service. In the middle west, the location of lumber yards depends largely on the location of the timber treating plants and distributing territory, so that, broadly speaking, the location of the lumber yard must be left entirely to the geographical location of the property.

LAYING OUT OF YARDS

In laying out bridge and building material yards, the first consideration must be sufficient space and trackage. I have found double tracks to be the most economical. They require less space and ensure a more concentrated organization, switching facilities, and the use of cranes.

Piling, stringers and other trestle timbers should be unloaded on tracks adjacent to each other so that a train of cars can be set in and as many feet of trestle timbers as required, loaded in the quickest possible time. Cranes should, of course, be used wherever obtainable in handling heavy timbers and piling.

The ideal bridge and building yard would include a timber treating plant, planing and wood-working mill, assembling yard, rail yard, frog and switch shop and a general store, for the reason that it is desirable wherever possible to load everything out complete in one shipment or shipments from a central distributing point. The yard should be so arranged that all the material, from the piling to the bolts and washers, will be loaded and shipped in the same train. Frequently a certain number of feet of track, as well as a certain number of trestle timbers, is required. The organization should be such that the necessary rail, fastenings, frogs, switches, etc., can be loaded and shipped along in the same manner.

ORGANIZATION

Maintenance officers have criticized our supply departments for failure to provide material in an intelligent and prompt manner, and very properly so. The reasons are many, but the principal one is that all supply officers do not understand the importance of assembling their materials so they can be shipped in the order they are needed. Having prepared his plans and received authority to do certain work, the maintenance officer then concentrates his efforts toward getting it done. Under a proper organization, he should immediately prepare his requisitions for the necessary material to do the work, describing and classifying them properly. The storekeeper should have sufficient storehouse and platform facilities for assembling such portions of the material required as must be assembled and held together.

Unless the requisition states specifically that certain portions of the material for the structure are to go forward,

nothing should be shipped until everything is ready. All of the material should be charged direct to the job when shipped. When the work is completed, whatever is left over should be picked up, shipped back and proper credit allowed to the work order.

PERSONNEL

The personnel necessary to handle an efficiently organized bridge and building material yard may be said to consist of a foreman in direct charge, with as many working foremen as may be necessary, and the forces divided into gangs of about five men each. It may be said that the foreman should be a practical bridge and building man, and this would appear to be a reasonable conclusion; but the best material yard foremen that I have ever developed were from clerks.

This leads me up to the question as to what department should maintain and operate bridge and building material yards. I have stated that I know of no sound reason why this work should not be handled by the supply department. My reasons are that the providing, distributing and accounting for materials has become a highly specialized service. It is now generally recognized that the work of buying, providing and distributing materials should not be divided, and that the supply department should have charge of and be responsible for all unapplied materials. Such a department must be properly organized and have a sufficient, well trained force to do the work in the most expeditious and economical manner.

The supply department is the providing department. It is the duty of supply officers to so systematize their organizations that they will know absolutely before a purchase is made that it is necessary; that the proper materials have been specified; that the requisitions are prepared in such a manner as to procure the broadest competition; to so arrange their materials when received and to so organize their forces that they can be accurately inventoried, loaded, shipped and delivered where they are required in the shortest possible time, and to see that the salvage is returned, sorted, classified, reclaimed and disposed of to the best advantage. Unless the supply department is organized first on the basis of giving proper and immediate service, it can never be economical or efficient, and can never hope to accomplish the real purpose for which it was organized, which is the providing of suitable materials when and where they are wanted, at the time they are wanted, and at the lowest net cost. For these reasons I reiterate that there is no sound reason why our supply departments should not organize and operate our bridge and building material yards in co-operation with our maintenance officers.

DISCUSSION

A number of members took issue with the paper and advocated a departmental supply under the direction of the bridge department.

HOUSING AND FEEDING BRIDGE AND BUILDING MEN

By F. E. Weise

Chief Clerk, Engineering Department; Chicago, Milwaukee & St. Paul, Chicago, Ill.

We are told that labor is scarce, that it is hard to secure and that it is still harder to hold. This is reiterated so frequently that we cannot lose sight of it. Under such conditions workmen are inclined to be uneasy and there is a tendency on their part to make frequent changes. Anything that will serve to make men more contented with their jobs will do much to help eliminate the waste that is the sure result of constant changing, because the breaking in of new men is expensive. One of the hardest places in which to hold men is in railroad maintenance or construction work,

and of the many things that have an influence on the conduct of the men none is more potent than the way in which they are housed and fed.

In order to do effective work, and render efficient service, a man must be in good health, and the primary object of the camp should be to keep him physically and mentally fit for his work. Good, wholesome, properly cooked and well served food; comfortable, clean and well-ventilated sleeping quarters; provisions for bathing and recreation will accomplish this and secure the good will of the men. Good will brings about co-operation, and will reflect in the amount and quality of the work accomplished.

It has been quite a common practice in the past to house crews in old cars unfit for commercial service. This has been done especially for extra gangs in which a complete camp on wheels was established. This practice is gradually becoming obsolete because equipment is too valuable to be tied up in this manner and cars are only being used for crews that must be moved frequently. Where possible, it will be found to pay to fit up cars for the purpose of housing men. There are many arrangements of kitchen, dining room and bunks. Like building a house; every man has his own ideas and one plan may be as convenient as another.

When men can be located at one point and cover their territory by trains or motor cars, it is possible to provide them with permanent and comfortable buildings. Such buildings are mostly of frame construction and may be as varied in size and arrangement as the requirements demand. Again old car bodies are used either singly or in pairs with a roofed space between. The Chicago & North Western has a plan for a portable building which can be taken apart readily and shipped to another location if desired, thus making it applicable to either temporary or permanent locations.

When it has been decided that a camp is to be established, the site of the work should be examined carefully, and the location of the camp determined upon by considering the conditions that will make it habitable. Location, water supply, drainage and sanitation should be given careful study.

For the average camp, the dining room and kitchen should be in one building and separated by a partition. In the dining room end sufficient tables should be provided so that the entire force may be served at one time. It should be wide enough to provide for two long tables at the sides with an ample aisle between, which will permit waiters to pass back and forth freely. This form of building can be loaded on a flat car and transported from one location to another. For larger camps it may be better to construct the building in the shape of a "T," in which the dining room is one large room and the kitchen an annex at the center of one side. Another good plan consists of three adjoining buildings placed in the form of a letter "U," and provides for two separate dining rooms with a common kitchen. This plan is desirable where the force is apt to fluctuate.

It is quite customary in determining the price to be charged for board and lodging to charge the employee what he would have to pay ordinarily in nearby towns and then furnish as good board as possible with a view to having the camp pay for itself. The cost of meals furnished to those employees needed to operate the camp are considered a part of the camp expense. It will be found more satisfactory to use a rate per week than a rate per meal. In the former case, the matter of lost meals need not be watched, and there are apt to be fewer misunderstandings. As a general experience, a camp of 25 men or less will not pay expenses; a camp of from 50 to 75 men can be made to come out about even, and a larger camp will show a slight profit. This bears out the previous statement.

DISCUSSION

A. Montzheimer (Elgin, Joliet & Eastern) stated that steel underframes should be placed under all cars used for

housing men in order to increase the safety of transportation in trains.

THE NATIONAL SITUATION

Albert Reichmann, district manager of the American Bridge Company, at Chicago, presented a paper telling of the outlook in the steel market and the working of the priority law. He expressed the belief that sufficient steel will be available for actual railway necessities if ordered sufficiently early.

Dr. Herman von Schrenk, consulting engineer, Southern Pine Association, St. Louis, and O. P. M. Goss, consulting engineer, West Coast Lumber Manufacturers' Association, Seattle, described conditions in the lumber market. Dr. von Schrenk told of the heavy demands for cantonment work calling for dimension timber followed by the action of the government last week in commandeering all 12 in. by 12 in. southern pine timber and larger for wooden ships. Mr. Goss described the western trouble with strikes which cut down the output to 35 per cent of the capacity at one time but this has now increased to 75 per cent. Both timber speakers expressed the belief that the supply was sufficient for necessities.

C. A. Lichty made a verbal report on the conservation of materials which brought active discussion.

THE LABOR PROBLEM

Much consideration was given to the labor problem. Four letters were read from members discussing methods of securing and holding labor. They brought out a most active discussion on the floor. B. F. Pickering (Boston & Maine) described successful results obtained by employing one married man in a gang whose wife served as cook.

OTHER BUSINESS

E. E. R. Tratman, Engineering News Record, presented a paper on methods of encasing steel structures with concrete, citing instances of this form of construction.

J. R. Pickering, superintendent car service, Rock Island Lines, prepared a paper on the conservation of cars carrying company material. Several members told how they had organized to prevent delays to cars.

Tuesday evening was devoted to the memory of the late Samuel F. Patterson, secretary-emeritus and for 18 years secretary of the association.

The annual banquet given by the Bridge and Building Supplymen was held in Hotel Sherman on Wednesday evening. The convention adjourned Thursday forenoon. Members made an inspection of the Gary plant of the American Bridge Company on Thursday afternoon.

The total registration of members was 150, approximately equal to the record established last year.

The following officers were elected at the closing session Thursday morning: President, S. C. Tanner, master carpenter, Baltimore & Ohio, Baltimore; first vice-president, Lee Jutton, division engineer, Chicago & North Western, Madison, Wis.; second vice-president, F. E. Weise, chief clerk, engineering department, Chicago, Milwaukee & St. Paul, Chicago; third vice-president, W. F. Strouse, assistant engineer, Baltimore & Ohio, Baltimore; fourth vice-president, C. R. Knowles, superintendent water service, Illinois Central, Chicago; secretary-treasurer, C. A. Lichty, purchasing department, Chicago & North Western, Chicago. Members of executive committee: A. B. McVay, supervisor bridges and buildings, Louisville & Nashville, Evansville, Ind., and J. H. Johnston, superintendent bridges and buildings, Grand Trunk, Montreal.

THE SUPPLY EXHIBIT

The Bridge and Building Supply Men's Association held an exhibit in rooms adjoining the convention hall. Forty

firms were represented, the largest number in the history of the association. The names of the companies and their representatives and the nature of their exhibits are given below:

American Abrasive Metals Co., New York. H. Weaver Mowery.
 American Tar Products Co., Chicago. P. L. Griffiths, S. H. Fields.
 American Valve & Meter Co., Cincinnati, Ohio. D. J. Higgins, J. T. McGarry.
 Baker, John Jr., Co., Chicago. R. M. Elder, Wm. Howe.
 Barrett Company, The, New York. Holt roof connection, Tarvia platforms, ready roofings, built-up roofing and bridge waterproofing, shingles, paints, wood preservative, shingle stains and plastic cement. C. F. Ames, H. E. Barney, E. J. Caldwell, J. A. Clarity, H. W. Flemming, F. W. Freeman, E. P. Hobson, W. T. Kelley, G. R. McVay, J. J. Ross, T. A. Wharton.
 Bird & Son, Chicago. Samples of Neponset roofing. M. L. Caton, H. A. Inwood.
 Carbide Manufacturing Co., Duluth, Minn. Carbide flood lights. Harry Rolinder, Gordon Paterson.
 Carey, Philip, Company, Cincinnati, Ohio. C. L. Cockrell, F. R. Schueler.
 Chicago Bridge & Iron Works, Chicago. Photographs of tanks. H. C. Brown, M. J. Treas.
 Detroit Graphite Co., Detroit, Mich. J. J. Hogan, L. D. Mitchell, W. D. Waugh, T. R. Wyles.
 Dickinson, Paul, Co., Chicago. Adjustable cast iron chimneys, models of Aeolus building ventilators and smoke jacks.
 Dixon, Joseph, Crucible Co., Boston, Mass. Silica-Graphite paint for bridges, building and water tanks, crucibles, lubricants, boiler graphite and Dixon's Eldorado pencils. F. R. Brandon, H. A. Nealley.
 Huff Manufacturing Company, Pittsburgh, Pa. Lifting jacks. E. A. Johnson, C. N. Thulin.
 Fairbanks, Morse & Co., Chicago. F. M. Condit, E. J. Coverdale, F. P. Drinker, E. C. Golegay, G. Howard, J. L. Jones, D. K. Lee, L. H. Matthews, A. A. Taylor.
 Flintkote Manufacturing Co., New York. Rex strip shingles, wide space shingles, Flintkote roofing, construction roofs, Paradox roofing. G. Ellingwood.
 Johns-Manville Co., H. W., Chicago. Asbestos roofing and asbestos smoke jacks. P. C. Jacobs, D. L. Jennings, W. H. Lawrence, C. E. Murphy, W. D. Otter, J. H. Trent, E. H. Willard, J. C. Younglove.
 Lehon Company, The, Chicago. Roofing, building paper and waterproofing fabrics. Tom Lehon, D. B. Wright.
 Massey, C. F., Company, Chicago. Photographs and literature on reinforced concrete products. C. F. Massey, J. E. Moody.
 Mineral Products Company, Chicago. Chas. V. Eades.
 Mudge & Co., Chicago. Solvit compound paint remover, photographs and literature. Geo. W. Bender, Burton W. Mudge, F. Possen.
 Nichols, Geo. P. & Bro., Chicago. Model of transfer table, photographs. Henry Rees, Geo. P. Nichols.
 Patent Vulcanite Roofing Co., Chicago. Roofing materials. H. A. Van Page, J. P. Woolsey.
 Pyrene Manufacturing Co., Chicago, Ill. Fire extinguishers. W. B. Causon, R. B. Henderson.
 Railway Review, Chicago. Current issues of paper. W. M. Camp, J. E. Gougeon, Harold A. Smith.
 Simmons-Boardman Publishing Company, New York and Chicago. Current issues of *Railway Age Gazette* and *Railway Maintenance Engineer*. John H. Cross, E. T. Howson, L. B. Sherman, J. M. Rutherford.
 Standard Asphalt & Refining Co., Chicago. E. K. Carter, R. F. Trumbull.
 U. S. Wind Engine & Pump Co., Batavia, Ill. Literature on pumps and tanks. C. E. Ward, I. E. Wolcott.
 Volkhardt Co., Inc., New York. Non-freezing water hydrants. Chas. P. Cogswell, Wm. Volkhardt.
 Whiting-Evans Mfg. Co., Chicago. Kerosene carburetors. F. R. Callans.

The officers of the Bridge and Building Supplymen's Association last year were: President, H. A. Nealley, Jos. Dixon Crucible Company, Boston vice-president, L. D. Mitchell, Detroit Graphite Company, Detroit; treasurer, P. C. Jacobs, H. W. Johns-Manville Company, Chicago; secretary, Tom Lehon, The Lehon Company, Chicago.

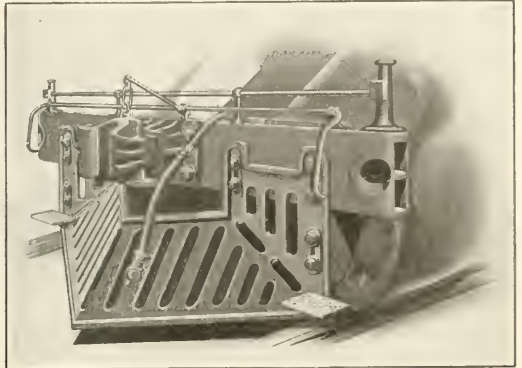
SIAMESE APPROPRIATIONS FOR 1918.—In the budget estimates of Siam for the fiscal year ending March 31, 1918, appropriations have been made to the amount of \$1,369,000 for the extension of the northern railway line, \$212,010 for the construction of branch lines of the southern railway, \$1,717,355 for the irrigation project now under construction, \$48,877 for Bangkok waterworks, and \$321,252 for the completion of the new royal yacht.

BRITISH STATIONMASTERS IN CONFERENCE.—A conference of stationmasters and freight agents, held recently at the Great Eastern Hotel, Liverpool street, elected a committee representative of all stations in the United Kingdom to meet the Railway Executive Committee to present their case for a general all-round improvement in conditions of employment. The conference was attended by 120 delegates, and was the first of its kind to be held.

CAST STEEL PILOT AND ASH PAN

The cast steel pilot and ash pan which are illustrated are products of the Commonwealth Steel Company, St. Louis, Mo. The pilot can be quickly applied, removed, raised or lowered, one means provided for raising or lowering it being a rack. This construction permits the alteration in height to be attained in a few minutes. The racks on the backs of the pilots are made to fit corresponding racks on the pilot beams, or on separate brackets fastened to the pilot beams.

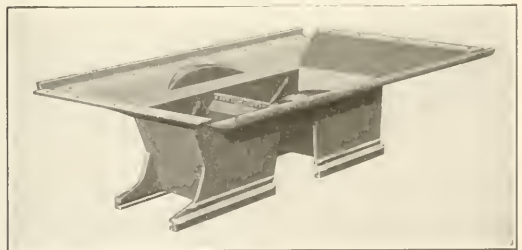
These adjustable pilots are cast in one piece and can readily be made to meet the requirements of new or old loco-



Commonwealth Cast Steel Pilot

motives. They are strong, simple and durable, requiring practically no repairs, and in time make quite a saving in maintenance cost, as compared with other types. They are easily repaired when bent in case of wreck. One of the designs embraces the requirements for both road and switch engines, a long step being placed at either side to meet switch engine requirements when a road engine is used in yard switching. They meet all Government requirements.

The cast steel ash pan is made for both single and double hoppers. These ash pans do away with the frequent expensive renewals and repairs characteristic of other types, as



Commonwealth Cast Steel Ash Pan

they are so designed that they do not burn out. They also prevent live coals from scattering on the roadway and causing fires. As these pans do not warp, a tight door is maintained that retains the coals. They are made up of but a few parts and have that advantage over the built-up types. This type of pan will last a long time and greatly reduces the maintenance costs for this particular part of the locomotive.

WOMAN BRANCH SECRETARY OF THE N. U. R.—The first woman branch secretary of the National Union of Railwaymen of England has been appointed at Ashton-under-Lyne.

General News Department

The Santa Fe lines paid 21.62 per cent of all the taxes collected in New Mexico during 1916.

The Pennsylvania has made a general increase in the pay of clerks in general offices, said to range from \$5 to \$10 a month per capita and to benefit 5,000 clerks.

The Delaware & Hudson is about to reopen its car shops at Green Island, New York, near Troy, which have been idle for seven years. The company is now trying to get the 100 men needed to organize a force to repair freight cars at these shops.

The Grand Trunk Railway of Canada has agreed to grant the engineers and firemen on all its lines the benefit of the "eight-hour law" pay now in force in the United States. The employees on the company's lines in the United States already enjoy the rates provided by this law.

The New Jersey Court of Errors and Appeals on October 8 affirmed the decision of the lower court sustaining the order of the State Public Utilities Commission requiring the abolition of sixteen grade crossings on the lines of the Erie Railroad in Paterson. The order issued by the commission allowed eight years for doing the work. If this decision stands it will mean the expenditure of \$3,000,000 or more.

The United States Civil Service Commission announces examinations, November 20, for the positions of passenger rate clerk and express rate clerk; and there are a large number of places to be filled, at salaries of \$100 a month. Applicants, men only, must be at least 20 years old and must have had experience in passenger or express rate work. There will be 100 passenger rate vacancies in the office of the Quartermaster of the army, at Washington, and 20 in the office of the Auditor for the War Department; and 20 vacancies in the position of express rate clerk in the Quartermaster's office. After six months' satisfactory service there will be an increase of pay. The duties of the positions are the revision, preparation and payment of passenger or express transportation accounts. Generally speaking, an experience of two years will be required, but applicants who have had experience in the government service will be required to show only one year of other experience.

Five Hundred Car Builders Wanted

The recruiting sergeant at Altoona, Pa., recently received a message from the War Department, reading as follows:

"Five hundred car builders or car repairmen for work in French railway shops, must be recruited in your district at once. They will be rated from \$33 to \$106 a month." With the message came the information that the men would be assigned to the 35th Engineers of the National Army.

Headlight Suit Dismissed

As briefly reported in last week's issue, Judge Anderson of the United States district court for the district of Indiana, at Indianapolis on October 9 dismissed a complaint of the New York Central against the enforcement of the Interstate Commerce Commission's order requiring the use of high power locomotive headlights. The complaint was dismissed, at the cost of the complainant, on motion of Blackburn Esterline, special assistant to the attorney general, not on the merits of the headlight order but on technicalities regarding the form of the complaint. The bill in equity named the Interstate Commerce Commission and the United States as defendants. The court held that although the United States was named in the title of the bill it was not named in the bill itself and therefore was not a party to the suit; and that all suits to enjoin the enforcement of an order of the Interstate Commerce Commission must be brought against the United States. The court also held that no relief was prayed for against the United States. The government had also argued that the suit could not be maintained against the commission, in

the form in which it was brought, in the jurisdiction of the district of Indiana. The railroad was represented by C. C. Paulding, J. B. Cockrum and F. H. Schmidt. An argument was also made on behalf of the Pennsylvania by S. O. Pickens.

A Canadian Railroads' War Board

The creation of a railway supervisory board composed of representatives of the Canadian Pacific, the Grand Trunk and the Government Railways (shortly to embrace the Canadian Northern) is under consideration by the Canadian Government. The board would work toward co-ordination of effort to prevent freight congestion and to facilitate the expeditious handling of traffic during the war. Co-ordination with United States lines is also proposed. The standardization of the size of rails on various railroads is likewise being considered.

Aishton Praises Press

"It is a great satisfaction to me to be able to say that the press of the country has been within recent months helping the railroads most generously and effectively." This statement was made at Chicago on October 12 at the convention of Associated Business Papers by R. H. Aishton, president of the Chicago & North Western and chairman of the central department of the Railroads' War Board.

"The only possible solution of our problem was to increase the amount of service of every mile of track, every engine and every car. We had to secure the co-operation of shippers in loading and unloading. To save men and fuel for freight service we had to make reductions in passenger service which, up to the present time, amount to 25,000,000 passenger train miles a year. To secure the good will and co-operation of the public the railroads had to get the reasons before the public, and both the railways and the nation owe a debt of gratitude to the press for the generous way in which it has told and commended what the railways have accomplished.

"There remains a great deal more which the press can do. Shortage of labor and material makes it extremely difficult to maintain our cars and engines and it is impossible to get new equipment. It is almost impossible to get rails. You will see that if the war goes on it is going to become more and more difficult to meet satisfactorily the demands of the public. If this is the case, the railways will need the help of the press more and more. . . . Use your powerful influence to get the business interests to co-operate with the managements of the railways in every way. . . ."

Pacific Railway Club Entertains Japanese Railway Men

The Japanese government, in anticipation of the widening of the gage of the government owned lines from 3 ft. 6 in. to 4 ft. 8½ in., has sent to this country a commission of prominent railway officers to investigate American operating methods. It is proposed to spend many millions of dollars upon this work and the commission is looking into all phases of railway construction, maintenance and operation.

During the first days of its stay in this country the commission visited the terminals of the Southern Pacific on San Francisco Bay and its shops at Sacramento, Cal., various industrial plants in the vicinity of San Francisco and the three-rail line of the Northwestern Pacific.

On October 11 the commissioners were the guests of the board of governors of the Pacific Railway Club at a banquet, where over 200 members of the club were present. G. H. Binkley, president, and William S. Wollner, executive secretary, welcomed the visitors. Dr. Y. Shima, the chairman of the Japanese commission and chief mechanical engineer of the Japanese Government Railways, responded.

Two papers on railway maintenance were presented by

members of the club: H. B. Titcomb, maintenance of way assistant of the Southern Pacific, speaking on "Maintenance of Way, Its Organization and Problems," and G. W. Rear, general bridge inspector of the same company, on "Maintenance of Structures." There was a general discussion of the topic, followed by informal talks on car loading efficiency, in which both the members and the visitors took an active part.

The commission left San Francisco for Los Angeles the following day and will go from there to various points throughout the United States. They are being accompanied by Ellwood G. Babbitt of the United States Bureau of Foreign and Domestic Commerce.

Steel Prices Reduced

An agreement between the War Industries Board and representatives of the steel interests fixing maximum prices on a number of steel articles, supplementing the basic prices covered by the agreement of September 24, was announced on October 11 with the approval of the President. The prices, which become effective immediately and are subject to revision on January 1, are as follows:

Commodity	Price agreed upon	Base
Blooms and billets 4 in. by 4 in. and larger.....	\$47.50 g.t.	Pittsburgh and Youngstown
Billets under 4 in. by 4 in.....	51.00 g.t.	Pittsburgh and Youngstown
Slabs.....	50.00 g.t.	Pittsburgh and Youngstown
Sheet bars.....	51.00 g.t.	Pittsburgh and Youngstown
Wire rods.....	57.00 g.t.	Pittsburgh
Shell bars.....	3 in. to 5 in..... 3.25 per 100 lb.	"
	Over 5 in. to 8 in..... 3.50 "	"
	Over 8 in. to 10 in..... 3.75 "	"
	Over 10 in..... 4.00 "	"
	Grooved..... 2.90 "	"
Skelp.....	Universal..... 3.15 "	"
	Sheared..... 3.25 "	"

It is stated that the prices enumerated have been fixed by the President on the assurance of those representing the steel industry that these prices equitably adjust the relations of the steel interests to each other, and will assist them in fulfilling their obligations to give the country 100 per cent of production at not to exceed the prices heretofore announced.

Measures will be taken by the War Industries Board for placing orders and supervising the output of the steel mills in such manner as to expedite the requirements for war purposes of the government and those nations associated with us, and to supply the needs of the public according to their public importance and in the best interest of all, as far as practicable.

Interstate Commerce Commission Reorganization

The Interstate Commerce Commission on Wednesday issued an order announcing its reorganization into three divisions, under the authority of the law increasing its membership to nine.

Except as otherwise provided by the commission Commissioners McChord, Meyer and Aitchison will constitute Division 1; Commissioners Clark, Daniels and Woolley will constitute Division 2; and Commissioners Harlan, Hall and Anderson will constitute Division 3. Each will have power and authority by a majority thereof to hear, determine, order, certify, report, or otherwise act as to any of the work, business or functions assigned or referred to it. Any division, with regard to any case or matter assigned to it, or any question brought to it under this delegation of duty and authority, may call upon the whole commission for advice and counsel, or for consideration of the case or question by an additional commissioner or commissioners assigned thereto by the whole commission; and the commission may bring before it as such any case or question so allotted or assigned.

To Division 1 will be assigned all cases set for argument beginning October 24, to and including October 31, 1917, and in addition Division 1 will be charged with the conduct of the work of the Bureau of Valuation other than considering and deciding the proceedings relating to the valuation of carriers' property. To Division 2 will be assigned all cases set for argument beginning November 1 to and including November 30, 1917, and in addition Division 2 will be charged with the disposition of applications and requests for suspension under the fifteenth section; of applications under the fourth and sixth sections; of cases on the special docket; of the transportation of explosives and dan-

gerous articles; and of tariffs carrying released rates. To Division 3 will be assigned all cases set for argument beginning December 1 to and including December 31, 1917, and in addition Division 3 will be charged with the disposition of all Board of Review cases which have been submitted and those not heretofore orally argued before the commission or any division thereof.

All cases set for argument and all cases submitted, other than Board of Review cases, in any one month after January 1, 1918, will be assigned in monthly rotation to the respective divisions in the order given above. Matters arising in connection with assigned cases will be disposed of by the division to which such cases have been assigned. All procedural questions requiring commission action arising in connection with unassigned cases may be disposed of by any of the divisions. Miscellaneous administrative matters requiring commission action, not otherwise provided for, may be disposed of by any division. The foregoing assignment does not include the consideration and disposition of valuation cases because the law provides that at least seven members shall participate in such cases. Each division may determine the time and place for its hearings and conferences and determine its order of business.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

- AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.
- ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—W. L. Connelly, Superintendent of Telegraph, Indiana Harbor Belt, Gibson, Ind. Next meeting, November 22, La Salle Hotel, Chicago.
- CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.
- CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.
- CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Morrison Hotel, Chicago.
- CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.
- CINCINNATI RAILWAY CLUB.—H. Boyter, Chief Interchange Inspector, Cincinnati, 101 Catew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.
- ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 568 Union Arcade Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.
- GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.
- NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.
- NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.
- Niagara Frontier Car Men's Association.—Geo. A. J. Hochrehe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.
- PACIFIC RAILWAY CLUB.—W. S. Wallner, Assistant to Chief Engineer, Northwestern Pacific R. R., San Francisco, Cal.
- PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.
- RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial Annex Hotel, Pittsburgh.
- RICHMOND RAILWAY CLUB.—F. O. Robinson, C. & O. Richmond, Va. Club has been suspended until after the war.
- St. Louis Railway Club.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.
- SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.
- TRAFFIC CLUB OF CHICAGO.—C. B. Signer, La Salle Hotel, Chicago.
- TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.
- WESTERN CANADA RAILWAY CLUB.—L. Kon. Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.
- WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.
- WESTERN SOCIETY OF ENGINEERS.—Edgar S. Nethercut, Acting Secretary, 1735 Menadock Block, Chicago, Ill. Regular meeting, first Monday in month, except January, July and August. Extra meetings generally on other Monday evenings except in July and August.

REVENUES AND EXPENSES OF RA

MONTH OF AUGUST. 1917

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REVENUES AND EXPENSES OF RAILWAYS

MONTH OF AUGUST, 1917—Continued

Name of road.	Average mileage during period.	Operating revenues.		Maintenance of way and structures.		Equipment.	Operating expenses.		General.	Total.	Operating ratio.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase or decrease last year.
		Freight.	Passenger.	Total (inc. misc.).	Way and structures.		Traffic.	Transportation.							
Georgia, Southern & Florida.	402	\$12,792	\$27,255	\$231,281	\$36,645	\$56,345	\$6,798	\$84,337	\$9,087	\$193,161	83.52	\$38,120	\$6,542	\$21,529	-\$14,789
Grand Rapids & Indiana.	575	380,251	227,804	1,016,331	181,816	276,300	11,210	244,332	21,057	445,990	75.54	186,748	37,235	145,511	-\$31,489
Grand Trunk Western.	347	625,000	1,136,750	8,735,053	1,016,327	568,629	11,067	2,788,846	13,934	5,083,568	62.25	3,086,462	455,585	2,630,441	-\$7,212
Grand Trunk, Island.	308	185,217	47,433	246,739	30,383	30,570	3,161	61,174	13,879	138,579	53.85	113,860	94,115	19,411	27,212
Gulf, Colorado & Santa Fe.	1,937	929,022	358,541	1,381,397	257,503	239,006	29,030	442,577	50,767	1,018,106	73.70	363,291	64,154	298,975	-102,713
Gulf, Mobile & Northern.	402	205,655	31,727	247,723	42,084	37,078	3,847	70,698	11,563	158,976	64.30	48,752	101,000	30,312	50,150
Hocking Valley.	349	907,592	91,168	1,098,333	1,081,321	1,174,32	3,483	2,468,811	29,804	83,577	55.41	66,439	6,154	60,227	19,280
Houston, East & West Texas.	949	441,443	159,233	648,508	83,487	68,662	16,855	214,515	19,979	400,600	62.03	345,208	32,451	211,775	-3,717
Illinois Central.	4,766	5,508,944	1,510,671	7,752,920	1,099,925	1,741,993	106,374	2,476,069	180,379	5,626,737	72.48	3,126,183	610,975	1,514,478	48,865
Indiana Harbor Belt.	169	649,346	271,347	447,798	56,597	33,162	2,772	21,594	9,970	320,454	71.36	127,344	3,072	118,239	40,594
International & Great Northern.	1,160	669,346	1,037,152	1,972,742	1,090,065	1,810,065	95,801	2,985,901	9,751	226,864	62.38	137,370	17,100	130,270	15,811
Kanawha & Michigan.	272	91,843	15,330	113,075	19,222	24,939	5,271	49,805	5,881	104,189	92.14	8,886	6,000	2,886	-1,575
Kansas City Southern.	755	887,133	170,968	90,970	16,577	21,839	3,816	41,285	5,219	88,738	97.98	1,832	6,000	4,188	15,757
Kansas City, Mexico & Orient of Texas.	465	680,730	169,968	860,360	126,377	126,377	24,267	335,997	31,269	647,340	60.77	418,522	50,659	367,429	77,533
Kansas City Terminal Co.	23	222,328	66,311	96,728	9,919	42,008	1,804	28,721	15,038	54,854	75.95	175,103	32,560	142,545	78,056
Lake Erie & Western.	93	202,468	6,008	221,486	17,571	29,208	11,903	83,116	5,613	136,011	61.41	85,474	5,600	79,874	18,901
Lehigh & New England.	266	343,962	51,054	400,360	36,938	44,086	9,936	108,480	9,764	159,671	55.68	159,671	20,230	139,421	55,142
Lehigh Valley.	1,443	3,983,562	535,054	4,966,856	565,004	766,220	76,512	2,084,584	87,631	3,598,206	73.33	1,688,680	206,390	1,062,199	144,043
Long Island.	1,937	429,865	1,313,337	1,993,666	170,013	170,013	37,688	581,690	21,611	1,647,101	60.93	471,182	55,385	361,782	21

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF AUGUST, 1917—Continued

Name of road.	Average mileage operated during period.	Operating revenues.			Maintenance of way and structures.			Trans- portation.			Total.	Operating ratio.	Net from operation.	Railway tax accruals.	Operating (or decr.) income, after tax.
		Freight.	Passenger.	Total (inc. misc.).	Way and structures.	Equip- ment.	Equip- ment.	Traffic.	Trans- portation.	Trans- portation.					
St. Joseph & Grand Island.....	258	\$115,854	\$168,793	\$284,647	\$108,287	\$29,327	\$138,614	\$3,113	\$67,537	\$6,371	\$217,457	73.83	\$340,486	\$97,884	\$242,102
St. Louis, Brownsville & Mexico.....	548	169,236	79,839	249,075	108,287	29,327	138,614	3,113	67,537	6,371	217,457	73.83	340,486	97,884	242,102
St. Louis, Merchants' Bridge Terminal.....	4,752	3,600,129	2,063,433	5,663,562	2,063,433	37,767	2,101,200	1,869	142,233	7,066	2,108,263	77.79	3,590,560	\$60,523	\$2,047,743
St. Louis, San Francisco & Texas.....	1,731	74,798	1,505,643	1,580,441	603,161	751,822	1,282,843	61,887	1,616,049	122,842	3,140,939	59.96	2,097,508	204,838	1,891,541
St. Louis Southwestern System.....	1,754	1,042,547	292,154	1,334,701	166,672	217,686	384,358	48,301	39,322	4,905	877,069	72.15	256,977	1,492	24,204
San Antonio & Aransas Pass.....	3,332	245,192	105,257	350,449	35,775	67,532	103,307	7,061	2,690,807	175,147	5,040,807	62.15	543,245	87,511	446,989
Seaboard.....	6,728	4,960,590	2,236,040	7,196,630	7,833,628	571,145	13,820,044	166,397	2,690,807	175,147	5,040,807	73.97	599,337	127,365	481,972
Southern in Mississippi.....	7,103	8,367,883	3,056,600	12,424,483	874,318	1,443,231	2,317,549	174,463	4,421,479	261,485	7,309,331	58.52	5,181,372	574,519	4,606,853
Southern Pacific Co. & Seattle.....	554	391,637	209,456	601,093	71,801	54,466	126,267	7,061	2,690,807	175,147	5,040,807	68.82	2,418,821	390,133	2,028,688
Spokane, Portland & Seattle.....	274	115,441	47,547	162,988	51,760	22,910	74,670	4,917	98,736	4,623	180,646	55.91	151,987	8,800	169,834
Tennese Central.....	81	73,419	12,983	86,402	93,580	9,229	102,809	2,087	26,558	3,339	45,634	48.61	48,246	7,396	40,849
Texas & New Orleans.....	468	78,192	126,580	204,772	47,615	83,199	130,814	7,838	140,956	11,569	312,256	56.74	238,062	25,515	212,403
Texas & Pacific.....	1,947	1,115,341	556,257	1,671,598	179,603	290,368	470,000	37,762	69,191	1,261,800	2,038,800	70.35	331,803	100,000	231,803
Toledo & Ohio Central.....	634	699,561	77,966	777,527	131,762	13,020	144,782	2,598	43,742	4,833	106,418	90.88	10,684	8,000	2,684
Union Pacific.....	4,455	5,527,216	55,401	5,582,617	51,769	87,021	138,790	22,153	92,444	429,526	429,526	65.33	227,995	205,995	25,985
Union R. of Delaware.....	369	56,031	15,627	71,658	24,423	23,012	47,435	17,199	38,315	7,014	93,443	124.14	18,565	5,100	23,757
Union R. of Pennsylvania.....	128	48,395	70,663	119,058	11,606	9,534	21,140	1,253	5,669	1,071	8,442	60.40	55,120	4,000	51,120
Union R. of Richmond.....	3,621	7,833,014	1,456,038	9,289,052	806,248	890,022	1,696,270	110,619	1,899,690	176,151	3,775,840	70.67	151,012	71,310	149,702
Union R. of St. Louis.....	3	115,441	47,547	162,988	51,760	22,910	74,670	4,917	98,736	4,623	180,646	82.91	160,168	9,000	92,168
Union R. of Virginia.....	171	94,101	59,207	153,308	17,926	27,768	45,694	6,121	53,755	5,348	113,603	66.33	56,636	9,500	47,156
Virginian.....	513	842,622	63,747	906,369	96,754	75,588	172,342	6,114	21,674	15,722	48,484	50.10	483,870	39,000	442,870
Washington.....	2,519	2,427,871	772,753	3,200,624	353,008	538,921	891,929	84,892	1,382,052	17,226	2,451,452	52.26	1,072,756	7,954	988,237
West Jersey & Seashore.....	36	275,311	95,257	370,568	130,451	13,020	143,471	14,138	40,853	18,280	70,266	53.95	599,335	41,239	558,135
Western Maryland.....	937	904,608	130,240	1,034,848	134,021	233,728	367,749	22,183	383,150	27,565	817,592	67.82	387,912	36,500	351,412
Western Ry. of Alabama.....	957	804,101	156,181	960,282	160,995	93,121	254,116	21,950	284,516	26,991	603,516	60.08	400,392	39,097	361,294
Western Ry. of Kansas.....	133	97,321	57,800	155,121	17,628	22,818	40,446	3,878	50,615	31,236	101,847	64.84	45,652	6,150	39,502
Wheeling & Lake Erie.....	512	1,932,683	59,684	1,992,367	150,439	383,948	534,387	25,883	361,094	33,039	1,106,313	73.33	403,509	130,900	272,373
Yazoo & Mississippi Valley.....	1,382	1,025,000	298,173	1,323,173	286,363	203,490	489,853	25,883	361,094	33,039	1,106,313	73.33	403,509	130,900	272,373
Alabama & Vicksburg.....	143	\$880,199	\$304,000	\$1,184,199	\$181,340	\$236,554	\$417,894	\$39,756	\$448,143	\$50,634	\$960,512	73.83	\$340,486	\$97,884	\$242,102
Alabama Great Southern.....	312	3,145,492	1,028,475	4,173,967	458,444	509,703	968,147	132,542	1,374,789	91,972	3,073,337	68.02	1,445,087	202,604	1,242,483
Ann Arbor.....	391	1,611,082	377,073	1,988,155	2,400,366	189,887	2,590,253	21,314	623,589	1,181	1,950,188	49.20	1,397,417	166,116	1,340,639
Arizona, Tucson & Santa Fe Ry.....	8,644	6,557,474	19,731,776	26,289,250	1,263,165	15,213,239	16,476,404	1,543,549	28,060,786	1,801,864	56,751,088	62.19	34,500,676	7,003,917	27,492,931
Atlanta & West Point.....	93	543,843	404,613	1,048,456	116,781	190,794	307,575	35,235	364,725	57,293	786,002	72.19	302,738	59,115	243,329
Atlanta, Birmingham & Atlantic Ry. Co.....	640	1,943,731	400,978	2,344,709	364,204	420,404	784,608	125,108	1,143,968	87,966	2,141,945	84.33	398,031	109,600	287,430
Atlantic Coast Line.....	1,677	7,849,162	188,287	8,037,449	323,314	456,473	779,787	39,788	867,262	155,575	1,643,627	138.55	8,990,888	277,400	7,913,234
Atlantic Coast Line & Norfolk.....	4,645	67,017,080	11,866,686	78,883,766	9,769,790	16,439,201	26,208,991	1,573,796	34,939,275	2,062,445	65,361,268	76.04	20,596,287	2,774,001	17,813,287
Baltimore & Annapolis.....	79	511,042	260,094	771,136	161,278	236,331	397,609	7,690	867,946	57,293	1,335,946	100.29	180,808	181,934	24,972
Baltimore, Chesapeake & Atlantic.....	632	2,280,439	511,524	2,791,963	811,673	54,441	866,114	11,185	455,107	20,990	706,504	87.05	105,119	19,701	85,416
Belt Ry. Co. of Chicago.....	2305	1,075,767	88,914	1,164,681	411,797	498,384	910,181	33,985	943,414	97,191	2,010,508	98.15	243,495	120,000	123,495
Brenner & Lake Erie.....	36	2,017,209	40,731	2,057,940	7,952,960	872,997	19,430,957	91,136	2,468,413	52,737	5,433,043	68.39	2,510,847	257,959	2,252,888
Brisson & Southern.....	44	545,517	15,801	561,318	229,895	198,198	428,093	6,797	307,632	32,423	533,424	39.99	1,255,697	150,615	1,105,082
Boston & Maine.....	2305	23,281,944	1,186,860	24,468,804	38,867,201	4,144,642	5,545,798	289,985	19,417,600	93,544	30,332,313	78.56	8,338,387	1,740,883	6,597,504
Buffalo & Susquehanna R. R. Corporation.....	283	8,400,000	88,914	8,488,914	1,174,776	1,174,776	2,349,552	1,207	3,700,114	27,577	7,541,861	78.49	2,068,518	240,000	1,820,314
Buffalo, Rochester & Pittsburgh.....	2305	23,281,944	1,186,860	24,468,804	38,867,201	4,144,642	5,545,798	289,985	19,417,600	93,544	30,332,313	78.56	8,338,387	1,740,883	6,597,504
Canadian Pacific Ry. Co. & Atlantic.....	283	8,400,000	88,914	8,488,914	1,174,776	1,174,776	2,349,552	1,207	3,700,114	27,577	7,541,861	78.49	2,068,518	240,000	1,820,314
Central of Georgia.....	1,919	6,334,808	2,466,321	8,801,129	1,479,014	1,479,014	2,958,028	1,207	3,700,114	27,577	7,541,861	78.49	2,068,518	240,000	1,820,314
Central New England.....	684	17,017,049	4,619,149	21,636,198	2,603,616	4,306,383	6,909,999	446,836	7,624,432	39,926	13,277,727	79.82	356,827	60,000	296,827
Central Western.....	481	1,597,195	637,715	2,234,910	286,321	241,616	527,937	130,933	560,942	104,049	1,521,209	56.82	1,155,841	107,200	1,048,641
Chesapeake & Western.....	2305	23,281,944	1,186,860	24,468,804	38,867,201	4,144,642	5,545,798	289,985	19,417,600	93,544	30,332,313	78.56	8,338,387	1,740,883	6,597,504
Chesapeake & Ohio Lines.....	343	1,311,997	265,612	1,577,609	237,334	174,697	412,031	35,122	524,236	33,349	1,001,408	68.40	465,618	55,500	406,115
Chesapeake & Ohio Lines.....	280	2,798,466	265,612	3,064,078	4,485,808	71,203	4,557,011	465,225	11,770,929	73,399	24,970,346	70.41	10,417,377	1,251,918	9,165,459
Chicago & Alton.....	1,053	9,449,337	3,037,820	12,487,157	1,396,971	2,666,523	4,063,514	317,886	4,221,428	265,434	8,786,342	78.00	3,003,627	424,250	2,581,372
Chicago & Eastern Illinois.....	1,131	10,367,888	2,260,512	12,628,400	1,507,814	3,391,886	4,900,000	159,156	2,631,461	137,791	5,180,539	72.29	3,105,276	250,200	2,855,076
Chicago & North Western.....	8,108	46,384,595	15,637,915	62,022,510	11,200,514	14,230,514	25,431,028	1,662,971	26,613,513	1,545,478	51,273,047	73.84	18,159,105	3,400,000	14,759,105
Chicago, Burlington & Quincy.....	9,373	57,176,700	15,437,915	72,614,615	9,267,074	12,628,018	21,895,092	1,662,971	26,613,513	1,545,478	51,273,047	64.98	27,985,575	3,666,384	24,321,191
Chicago, Detroit & Can. Grd. Trk. Jctn.....	60	591,264	119,415	710,679	84,911	130,357	215,268	12,116	499,128	16,169	735,671	83.01	149,959	28,568	121,388

REVENUES AND EXPENSES OF RAILWAYS

EIGHT MONTHS OF CALENDAR YEAR, 1917—Continued

Name of road.	Average mileage operated during period.	Operating revenues—			Operating expenses—			Total.	Operating ratio.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decrease) comp. with last year.
		Freight.	Passenger.	Inc. misc.	Way and equip.	Traffic.	Trans- portation.						
Chicago Great Western.....	1,496	\$7,329,744	\$2,399,441	\$10,682,662	\$1,448,837	\$1,895,252	\$156,200	\$1,138,007	76.37	\$2,534,054	\$431,000	\$2,084,978	—\$73,937
Chicago, La Crosse & Louisville.....	634	4,132,582	1,354,240	5,961,596	546,617	1,058,352	148,248	41,200,623	69.12	1,840,979	293,726	1,546,914	—1,435
Chicago, Milwaukee & St. Paul.....	10,338	5,147,186	1,888,091	7,957,047	2,405,533	3,198,307	439,909	1,872,721	87.01	279,569	24,723	254,846	—69,506
Chicago, Peoria & St. Louis.....	255	1,141,186	1,898,091	1,397,047	1,706,966	3,025,657	47,797	35,256,298	83.19	215,900	63,740	150,161	—3,010,344
Chicago, Rock Island & Gulf.....	7,759	2,423,238	3,117,771	2,423,238	338,402	362,419	82,239	90,262	68.42	764,745	89,621	674,596	164,166
Chicago, St. Paul, Minn. & Omaha.....	1,753	8,764,336	3,640,960	13,565,133	1,949,334	1,949,334	1,929,209	2,602,330	72.99	3,665,178	804,663	2,855,195	1,845,751
Chicago, Terre Haute & Southeastern.....	375	2,210,163	138,890	2,409,211	276,995	543,871	34,168	835,388	73.61	635,789	115,837	508,214	209,656
Cincinnati, Indianapolis & Western.....	322	1,249,593	365,337	1,777,922	221,997	291,667	54,135	775,679	78.00	391,517	79,829	312,188	9,021
Cincinnati, New Orleans & Texas Pacific.....	397	6,127,941	1,820,496	8,590,037	559,644	1,944,063	228,998	2,668,314	66.54	2,874,165	49,425	2,424,731	93,500
Cincinnati, Northern, Chic. & St. Louis.....	237	2,355,597	740,434	3,054,367	302,184	6,595,695	538,398	13,592,299	71.73	9,257,977	1,306,000	8,145,784	34,705
Coal & Coke.....	198	67,834	147,580	858,361	162,580	214,379	9,533	331,662	86.39	116,762	20,342	74,262	—22,936
Colorado Midland.....	338	287,213	66,604	383,373	123,355	72,671	20,165	169,308	104.82	—18,427	—30,412	—38,769	.....
Colorado & Southern.....	1,188,016	7,017,356	681,148	1,195,818	91,850	2,121,713	209,583	4,342,104	61.87	2,675,452	359,273	2,314,689	70,734
Colorado & Wyoming.....	86	623,497	119,431	765,032	60,449	186,156	12,238	1,879,311	49.10	337,620	29,977	307,862	—7,678
Cripple Creek & Colorado Springs.....	170	1,110,111	166,410	4,423,645	74,436	593,276	12,700	2,121,852	49.31	337,822	25,464	302,357	34,032
Cumberland Valley.....	484	2,599,778	456,885	3,199,153	240,940	2,778,187	34,783	1,014,710	51.54	1,549,479	127,697	1,426,783	386,108
Delaware & Hudson Co.—R. R. Dept.....	879	16,539,995	2,029,011	19,630,590	1,725,201	3,957,865	212,964	8,093,724	75.40	4,829,274	492,600	4,336,723	—88,008
Delaware, Lackawanna & Western.....	935	27,778,177	5,967,303	33,745,480	2,046,113	5,703,533	646,093	13,819,286	64.18	13,819,286	204,928	11,461,705	—110,213
Denver & St. Grande.....	2,535	13,708,722	3,219,933	17,528,655	3,219,933	17,528,655	11,528,655	11,528,655	60.05	5,761,448	761,011	4,999,211	—6,964,445
Denver & Western.....	385	1,594,889	223,188	883,402	109,840	189,081	17,770	338,765	77.39	1,579,592	64,274	1,100,723	—31,197
Detroit & Mackinac.....	80	1,233,876	1,853,705	65,377	85,752	389,704	27,241	582,027	46.46	670,677	58,554	612,123	—8,780
Detroit & Toledo Shore Line.....	191	1,547,893	301,910	2,199,006	300,349	357,017	44,741	1,321,210	94.20	127,532	28,960	98,572	—388,128
Detroit, Grand Haven & Milwaukee.....	191	1,547,893	301,910	2,199,006	300,349	357,017	44,741	1,321,210	94.20	127,532	28,960	98,572	—388,128
Detroit, Toledo & Irontrunk.....	206	1,760,716	127,843	1,888,559	176,793	568,536	37,760	1,217,552	98.88	1,944,109	64,000	1,908,624	191,247
Detroit, Toledo & St. Clair.....	206	1,760,716	127,843	1,888,559	176,793	568,536	37,760	1,217,552	98.88	1,944,109	64,000	1,908,624	191,247
Dubuque, South Shore & Atlantic.....	640	1,195,166	246,613	8,931,556	1,188,759	883,805	25,351	1,848,333	49.73	4,669,787	735,849	3,934,200	—50,058
Dubuque, South Shore & Atlantic.....	600	1,997,708	685,600	2,827,010	552,077	365,435	56,974	1,218,456	79.88	578,802	134,199	444,588	—89,538
Duluth, Winnipeg & Pacific.....	191	1,217,242	194,136	1,453,916	134,345	176,164	21,531	624,570	76.60	425,123	72,277	352,845	—6,272
Elgin, Joliet & Eastern.....	82	986,474	1,659,701	10,385,461	237,181	2,684,181	65,556	3,597,135	70.76	4,094,741	382,846	2,711,834	565,111
El Paso & Southwestern Co.....	1,988	34,699,986	6,480,481	46,141,836	4,641,836	11,757,537	778,396	20,111,391	83.27	7,719,592	1,705,882	5,908,665	469,006
Florida East Coast.....	765	3,027,740	1,954,297	5,864,948	539,131	655,460	173,769	1,634,738	50.30	2,914,648	310,425	2,604,022	—49,707
Fort Worth & Denver (City).....	454	2,770,359	1,002,391	4,001,110	390,883	713,492	61,644	1,172,437	62.60	4,896,433	157,500	1,338,858	71,333
Galveston, Harrisburg & San Antonio.....	1,361	8,977,451	2,921,530	12,580,115	1,551,959	1,615,112	265,298	4,073,367	62.50	4,716,924	432,838	4,277,030	2,281,176
Galveston, Harrisburg & San Antonio.....	1,361	8,977,451	2,921,530	12,580,115	1,551,959	1,615,112	265,298	4,073,367	62.50	4,716,924	432,838	4,277,030	2,281,176
Georgia Southern & Florida.....	314	1,580,276	641,855	2,405,639	215,368	389,268	105,694	985,536	73.39	627,993	87,700	238,970	—101,274
Grand Rapids & Indiana.....	375	2,848,912	1,098,377	4,326,650	225,398	773,495	81,405	1,958,848	81.04	819,985	187,255	632,200	83,094
Grand Trunk Western.....	474	1,834,816	1,041,283	3,396,630	725,461	1,132,241	131,289	2,782,888	78.04	4,407,507	297,880	1,118,696	83,821
Great Northern.....	3,937	10,953,511	4,030,723	15,514,234	2,079,959	8,094,445	2,238	19,337,266	68.02	18,698,322	3,438,882	14,569,761	—1,432,700
Gulf, Colorado & Santa Fe.....	337	7,597,216	2,109,287	10,834,486	2,078,959	1,597,059	239,636	3,553,903	72.87	9,390,061	492,704	2,433,615	789,583
Gulf, Mobile & Northern.....	41	1,208,324	204,036	1,495,002	208,433	251,937	31,379	464,166	66.97	1,035,893	67,357	401,746	31,720
Hocking Valley.....	380	5,775,838	625,150	6,841,351	601,331	1,465,366	71,658	2,280,445	68.85	2,267,337	496,000	1,764,624	593,341
Houston, East & West Texas.....	1,009	3,400,915	1,050,052	4,430,329	259,566	636,374	152,959	1,565,566	68.24	4,207,154	52,978	413,369	116,515
Illinois Central.....	4,766	41,453,205	5,670,704	72,490,944	11,623,307	16,677,146	18,929,520	13,339,750	70.64	16,647,146	4,730,640	12,916,506	309,032
Indiana Harbor Belt.....	109	5,304,806	1,718,665	7,516,734	968,992	1,256,222	181,541	2,839,888	72.00	2,117,842	265,638	1,850,113	808,852
International & Great Northern.....	1,160	2,603,806	2,225,338	4,829,144	1,977,627	583,787	24,368	980,155	70.64	683,986	135,198	548,766	198,932
Kanawha & Michigan.....	277	1,854,742	260,806	2,225,338	1,977,627	583,787	24,368	980,155	70.64	683,986	135,198	548,766	198,932
Kansas City Southern.....	755	6,219,285	1,088,821	7,951,641	787,213	1,144,289	200,942	2,491,893	100.93	33,220	41,590	—22,166	79,130
Kansas City Terminal Co.....	23	471,280	446,635	5,421,170	62,617	878,079	109,540	2,118,578	61.38	3,072,050	405,274	2,663,606	35,790
Lake Erie & Western.....	906	2,799,554	1,063,626	2,467,005	293,438	356,859	22,684	726,582	70.14	1,732,979	232,000	1,341,530	—179,110
Lehigh & New England.....	296	2,599,554	1,063,626	2,467,005	293,438	356,859	22,684	726,582	70.14	1,732,979	232,000	1,341,530	—179,110
Lehigh Valley.....	1,412	29,343,100	3,126,360	35,266,000	3,953,205	6,007,765	600,066	15,777,143	75.92	8,490,304	1,467,530	7,022,774	144,838
Los Angeles & Salt Lake.....	397	2,022,970	6,599,676	10,628,222	1,251,722	1,900,086	99,905	4,557,106	68.34	3,460,208	589,755	2,860,257	21,515
Los Angeles & Salt Lake.....	397	2,022,970	6,599,676	10,628,222	1,251,722	1,900,086	99,905	4,557,106	68.34	3,460,208	589,755	2,860,257	21,515
Louisiana Arkansas.....	342	1,461,555	235,215	1,867,224	187,224	209,784	51,282	572,571	74.13	367,996	17,579	188,376	—96,792
Louisiana Western.....	208	1,513,768	570,115	2,114,753	183,597	266,198	400,838	900,936	48.69	1,136,151	124,679	434,651	249,635
Louisville & Nashville.....	5,970	36,051,934	9,993,067	49,244,003	4,994,024	1,031,566	16,262,295	39,0324	68.88	15,274,819	2,675,673	12,599,786	450,681
Louisville, Henderson & St. Louis.....	200	1,060,522	301,862	1,435,640	190,883	179,767	39,103	475,671	68.65	521,912	438,017	48,000	143,750
Minne Central.....	1,862	2,081,101	2,041,793	33,890,362	1,767,830	5,041,113	4,765,612	64,607	71.29	2,445,508	469,682	1,975,628	346,059
Minneapolis & St. Louis.....	130	1,406,883	382,215	1,863,766	141,721	331,382	33,700	579,219	71.35	531,450	1,444,000	2,776,592	1,707,665
Minneapolis & St. Louis.....	130	1,406,883	382,215	1,863,766	141,721	331,382	33,700	579,219	71.35	531,450	1,444,000	2,776,592	1,707,665
Midland Valley.....	372	740,415	24,184	786,483	178,706	150,650	3,826	432,343	98.45	13,225	4,277	9,048	401,463
Minneapolis & St. Louis.....	1,428	16,275,995	4,226,648	7,027,206	1,060,776								

REVENUES AND EXPENSES OF RAILWAYS

EIGHT MONTHS OF CALENDAR YEAR, 1917—Continued

Name of road.	Average mileage operated.	Operating revenues—Total.			Operating expenses—Total.			Net operating ratio.	Railway tax accruals.	Operating income (or loss).	Increase (or decrease) comp. with last year.
		Freight.	Passenger.	(Inc. misc.)	Way and equip. ment.	General.	Trans- portation.				
Missouri & North Arkansas.....	365	\$853,502	\$934,322	\$162,186	\$149,148	\$42,687	\$356,013	79.13	\$194,968	\$153,615	\$74,417
Missouri, Kansas & Texas System.....	3,865	18,555,923	6,385,186	26,533,164	5,590,500	531,465	6,737,633	73.34	5,832,859	4,736,184	2,342,610
Missouri, Oklahoma & Gulf.....	332	980,560	181,138	1,246,418	217,947	34,229	744,248	71.48	329,315	72,548	156,369
Missouri, Oklahoma & Gulf of Texas.....	302	1,070,267	373,884	1,444,151	253,583	45,073	1,017,103	81.60	136,060	136,381	15,275
Mobile & Ohio.....	1,227	14,682,657	1,915,795	2,935,072	3,055,253	433,979	6,531,742	66.78	6,554,251	5,761,809	.....
Monongahela & Ohio.....	1,108	1,380,464	705,458	8,986,342	2,682,855	301,879	3,678,969	73.39	387,163	1,911,432	24,548
Monongahela Connecting.....	401	3,015,409	.....	1,415,531	2,660,937	107,112	7,395	398,702	607,891	559,439	-102,482
Morgan's La & Tex. R. & S. Co.....	6	.....	.....	.....	4,210,060	257,651	199,071	2,753	6,007,722	607,891	-102,482
Nashville, Chattanooga & St. Louis.....	1,237	6,655,672	2,135,110	9,653,385	4,459,669	630,073	9,439	1,216,066	3,059,329	87,160	28,738
New Orleans & North Eastern.....	263	2,442,869	118,222	3,064,409	1,764,793	62,934	301,816	60.59	664,351	935,569	67,855
New Orleans Great Northern.....	285	5,676,618	234,264	1,226,652	1,27,309	196,454	25,006	37,647	43,706	43,706	7,662
New Orleans, Texas & Mexico.....	191	676,433	184,722	1,824,884	441,510	115,046	37,887	21,417	253,504	387,641	-177,814
New York Central.....	6,082	96,551,527	37,226,883	55,306,442	16,721,481	2,072,214	61,441,479	52.52	1,127,021	7,517,021	1,916,832
New York, Chicago & St. Louis.....	571	7,731,957	1,251,718	11,545,069	5,151,593	338,339	3,756,577	1,590,081	93,888,777	71,171	16,156,641
New York, Ontario & Western.....	568	3,916,654	1,374,466	6,181,345	647,403	1,012,519	74,820	2,253,239	154,422	3,144,003	-119,645
New York, Philadelphia & Norfolk.....	171	2,811,158	465,577	3,858,624	340,807	648,283	40,908	1,818	2,606,891	72,701	978,733
New York, Susquehanna & Western.....	136	1,738,534	399,741	2,389,141	265,919	19,277	1,688,014	45.25	1,794,037	259,105	.....
Norfolk & Western.....	2,085	36,264,118	4,415,559	42,655,951	19,795,755	527,665	13,353,467	159,508	26,388,072	13,004,545	16,994,037
Norfolk & Western.....	6,517	4,207,966	9,535,635	5,717,416	801,295	6,552,147	819,914	1,974,959	1,049,514	3,161,200	1,069,692
Northern Pacific.....	907	14,262,862	1,340,515	31,191,913	4,657,673	363,896	44,213	1,077,885	84,137	2,040,983	926,466
Oahu Ry. & Land Co.....	114	60,594	170,686	847,027	81,879	63,573	6,276	223,533	40,816	415,905	.....
Oregon Short Line & Nav. Co.....	2,307	14,359,949	3,650,268	19,455,290	2,195,423	2,130,918	290,779	5,311,034	64,169	10,706,955	54,728
Panhandle & Santa Fe.....	630	3,011,831	371,356	4,423,161	1,671,220	251,606	3,756	1,333,360	102,264	2,717,731	60,071
Pennsylvania Company.....	1,735	37,001,831	8,884,349	51,397,150	6,122,574	9,884,949	694,556	22,348,369	1,255,082	40,349,393	78,511
Pennsylvania Railroad.....	4,563	118,985,283	33,414,341	168,946,348	20,396,395	33,680,483	1,381,878	67,255,903	122,998,098	76,955	38,948,429
Peoria & Pekin Union.....	79	11,534	4,570	81,625	8,898	115,238	210,305	489,337	26,374	717,152	88,255
Pennsylvania, Baltimore & Washington.....	2,718	10,410,066	8,211,925	20,355,138	3,971,194	3,361,160	5,831,540	467,100	15,909,896	79,448	4,635,493
Pittsburgh & Lake Erie.....	225	13,611,615	1,511,422	16,659,945	1,258,975	3,370,150	132,912	5,210,695	295,308	10,869,526	65,824
Pittsburgh & West Virginia.....	63	575,442	50,786	678,868	90,724	94,777	9,945	21,641	31,605	461,844	.....
Pittsburgh, Cincinnati, Chic. & St. Louis.....	2,399	34,418,034	8,624,517	48,657,920	5,290,194	9,482,046	811,748	19,931,067	1,157,624	36,488,917	74,909
Pittsburgh, Shawmut & Northern.....	283	1,750,951	438,890	2,459,941	334,439	390,866	70,755	1,677,564	87,899	1,872,307	17,522
Pittsburgh, Shawmut & Northern.....	283	1,750,951	438,890	2,459,941	334,439	390,866	70,755	1,677,564	87,899	1,872,307	17,522
Railroad, Erie, Delaware & Potomac.....	468	1,389,268	1,826,680	2,844,235	351,147	458,070	82,739	1,778,706	64,903	2,146,832	73,521
St. Joseph & Grand Island.....	205	1,323,746	205,518	1,544,068	565,404	194,027	29,121	521,267	43,071	1,401,435	90,881
St. Louis, Brownsville & Mexico.....	548	1,430,801	881,534	2,883,843	387,625	310,121	83,241	727,010	88,341	1,573,543	60,901
St. Louis, Merchants' Bridge Terminal.....	3,461	1,307,374	4,455,041	6,191,416	3,000,494	1,247,766	1,947,769	1,485,201	2,362	18,592,623	73,624
St. Louis, San Francisco & Texas.....	212	24,523,401	1,671,482	36,595,126	4,130,668	5,256,822	572,464	12,551,069	1,497,167	682,407	61,024
St. Louis Southwestern System.....	1,734	8,287,196	1,263,718	10,545,588	1,203,136	2,053,954	1,768,911	3,188,301	377,860	7,234,534	67,321
San Antonio & Aransas Pass.....	732	1,692,063	610,870	2,493,797	426,297	437,587	56,834	1,332,634	113,135	2,330,770	93,461
Seaboard.....	3,461	1,307,374	4,455,041	6,191,416	3,000,494	1,247,766	1,947,769	1,485,201	2,362	18,592,623	73,624
Seaboard, Roanoke & Norfolk.....	298	3,727,514	1,320,581	5,677,153	667,736	1,178,834	193,339	335	4,34,204	637,262	81,007
Southern in Mississippi.....	7,085	61,940,404	21,263,718	91,055,283	8,400,292	11,983,861	1,417,461	32,172,665	2,149,544	57,295,959	60,701
Southern Pacific Co.....	7,085	61,940,404	21,263,718	91,055,283	8,400,292	11,983,861	1,417,461	32,172,665	2,149,544	57,295,959	60,701
Spokane, Portland & Seattle.....	534	2,028,185	1,210,370	4,421,713	807,827	356,465	64,722	1,020,079	107,153	2,091,955	47,301
Tennessee Central.....	295	813,646	265,347	1,158,514	188,620	188,720	39,981	423,398	57,318	897,269	77,451
Terminal Ry. Assn. of St. Louis.....	2,997	566,653	90,471	2,575,876	500,152	135,980	21,955	728,351	97,308	1,479,266	53,777
Texas & Pacific.....	468	2,806,325	955,002	4,057,951	621,988	621,988	69,831	1,216,862	40,637	2,474,475	61,281
Texas & Pacific.....	1,947	9,288,491	3,762,370	14,029,171	3,270,736	1,851,885	30,181	5,742,163	460,671	9,967,641	71,051
Toledo & Ohio Central.....	436	4,311,408	430,863	5,032,098	690,436	931,858	58,528	2,048,577	86,559	3,830,561	76,112
Toledo, Ohio & Western.....	247	4,311,408	430,863	5,032,098	690,436	931,858	58,528	2,048,577	86,559	3,830,561	76,112
Toledo, Ohio & Western.....	247	4,311,408	430,863	5,032,098	690,436	931,858	58,528	2,048,577	86,559	3,830,561	76,112
Trinity & Brazos Valley.....	128	4,472,651	.....	4,472,651	1,135,540	337,562	40,234	1,41,676	44,656	884,460	68,131
Union R. of Delaware.....	385	151,160	228,487	695,629	50,989	86,491	16,038	315,982	37,273	511,034	73,461
Union R. of Delaware.....	385	151,160	228,487	695,629	50,989	86,491	16,038	315,982	37,273	511,034	73,461
Union R. of Baltimore.....	8	1,062,291	8,401,865	47,141,944	6,038,088	6,112,112	930,881	1,350,172	14,178,469	28,931,451	61,327
Union R. of Baltimore.....	8	1,062,291	8,401,865	47,141,944	6,038,088	6,112,112	930,881	1,350,172	14,178,469	28,931,451	61,327
Vicksburg, Shreveport & Pacific.....	171	785,922	355,167	1,298,313	1,135,540	337,562	40,234	1,41,676	44,656	884,460	68,131
Virginian.....	513	619,848	349,447	6,931,895	528,623	1,010,347	47,139	1,951,846	122,859	3,680,747	53,231
Washington Southern.....	359	1,920,162	684,701	2,617,860	2,528,902	3,320,883	223,628	10,728,932	606,188	18,284,011	69,841
Washington Southern.....	359	1,920,162	684,701	2,617,860	2,528,902	3,320,883	223,628	10,728,932	606,188	18,284,011	69,841
Western Maryland Shore.....	216	1,553,406	891,201	1,615,205	104,793	169,971	11,574	2,026,168	30,035	850,868	5,268
Western Maryland Shore.....	216	1,553,406	891,201	1,615,205	104,793	169,971	11,574	2,026,168	30,035	850,868	5,268
Western Pacific.....	957	5,039,405	943,900	6,270,576	922,567	1,041,534	169,314	1,296,136	167,746	3,835,113	71,355
Western Ry. of Alabama.....	512	5,974,944	357,437	1,038,514	125,053	210,306	51,009	331,825	36,577	77,5416	61,116
Wheeling & Lake Erie.....	132	5,914,388	430,442	6,945,405	886,832	1,093,873	65,641	2,464,513	158,743	4,685,441	67,421
Yazoo & Mississippi Valley.....	1,352	8,490,933	2,033,907	11,141,401	2,001,685	1,870,062	174,558	3,685,815	288,462	7,999,626	71,801

Traffic News

C. M. Woodward, assistant superintendent of the Boston & Maine at Springfield, Mass., overrun with hundreds of cars of freight awaiting transfer, has sent out an appeal to the schools and colleges for young men and boys who are willing to work in the freight houses on Friday, Saturday and Sunday.

The express companies' embargo against live stock threatened the success of the National Dairy Show at Columbus, Ohio, this week; but in view of the importance of the show as a factor in the campaign to stimulate production, and at the request of the Transportation Department of the Government Food Administration, the express companies so modified their embargoes that the cattle to be used for exhibition purposes were accepted as in former years.

The transportation division of the United States Food Administration is acting to facilitate the marketing of the coming sugar crop in Cuba, which will commence moving about December 15, and at the suggestion of the Food Administration, the Cuban government has lent to the Cuban Railway \$5,000,000 with which to put its road in better condition to properly handle the coming crop. Both the Cuban government and the railway had placed orders in the United States for many needed supplies which they were unable to get filled. These orders were scattered among some 50 business firms in this country. The Food Administration wrote and explained the necessities of the situation, and most of the supplies are now going forward.

The Buffalo, Rochester & Pittsburgh calls on everybody to remember the injunction, "Do your Christmas shopping early." In order to facilitate freight movement, it has been necessary to curtail passenger service. If people, who go to Rochester from the surrounding towns to buy, will begin now to get their Christmas buying out of the way, it will help prevent congestion and crowding of trains during the few days just previous to Christmas. For those who expect to send presents to friends and relatives at a distance, early shopping is imperative. The express service is now working at capacity, business having increased during the past few months 50 per cent. The country has a million men at training camps receiving and sending a large volume of mail, and to get Christmas presents through on time will call for prompt action everywhere.

The United States Geological Survey has issued a statement on coal production in 1917 compared with 1916, pointing out that the shortage of bituminous coal is not due to the failure of the mines to produce more coal than in the past, for the country on September 1 was about a month ahead of last year in output and is expected to finish the year with an increase of 10 per cent over 1916, the banner year, and of 25 per cent over 1915. "The tremendous increase in manufacturing and transportation activity has created a demand certainly greater than the 10 per cent by which production has increased. In the second week of July the average daily production was more than 1,900,000 tons, the highest point ever attained. In the lowest week for the summer, 1,638,000 tons was recorded, and in the first eight months of 1917 the output was 363,500,000 tons, or 37,000,000 tons more than in the first eight months of 1916. In the same period shipments of anthracite increased 16 per cent over those of 1916. Bituminous production in 1916, including coal made into coke, was 502,518,545 tons.

Shipments of anthracite coal for the eight months ending August 31 amounted to 52,291,445 tons, as compared with 44,623,063 in the first eight months of 1916. The increase for the eight months was 7,668,382 tons, or 17.18 per cent; and for the month of August alone it was 28.35 per cent. Shipments to New England, New York City, Philadelphia, Buffalo and Erie have been heavier than during the corresponding period last year. New York received 12,666,650 tons last year, and 13,912,384 this year, a gain of 1,245,734 tons. New England last year got 3,438,242 tons by rail and 2,351,995 by barge, a total of 5,790,237 tons. This year the figures are 4,195,575 by rail and 2,260,366 by barge, a total of 6,455,941 tons, showing a gain of 665,704 tons.

Buffalo and Erie, taken together, got 4,346,917 tons last year and 4,288,002 this year, showing a loss of 58,915 tons. This is attributed to the cold, late spring, which permitted little or no coal to be carried over, and to the Fuel Administration's policy to ship coal past the lake ports to the needy Northwest before the close of navigation. The deficiency will be made up later, and special emergency calls for coal, if authentic, will receive prompt consideration at Washington.

Heavy Fruit Traffic From California

The Southern Pacific announces that in the last 90 days the Pacific Fruit Express has carried 27,000 cars of fruit and other perishables out of California for the East. This sets an average for the three months of 300 cars a day, a volume of traffic of this character never equaled before. The extraordinary fruit movement is still going on. The Pacific Fruit Express has not only exhausted its own supply of cars (12,500 cars), but has hired at high premium between 8,000 and 9,000 foreign cars. New cars, delayed by government requisitions on foundries and car shops, are arriving now at the rate of 20 or 30 a day.

The grape crop is larger than last year, and is later. Two hundred cars a day are now ready to move, with 3,000 cars yet to be hauled. Moreover there are still carloads of onions and potatoes to move and 3,500 cars of oranges.

So great has been the traffic in military trains and government freight that the running time of fruit trains to Chicago has had to be lengthened from six days to eight days, a serious loss in the effective use of the cars.

Eastern Roads Want Increased Commodity Rates

At an informal conference with the Interstate Commerce Commission at Washington on Wednesday, the traffic executives of the lines in Official Classification territory submitted a proposed plan for asking the commission's permission to advance by approximately 15 per cent the commodity rates on which advances were not allowed by the commission in the 15 per cent case decision in June. The delegation of traffic executives was headed by George F. Randolph, commissioner for the lines in Official Classification territory, and George Stuart Patterson, counsel. Mr. Patterson said that the commission in its decision had objected to a horizontal percentage advance in commodity rates and had ordered the tariffs to be cancelled. New tariffs, including increases of approximately 15 per cent, but compiled to preserve existing relationships, had later been filed (prior to the time when the amendment requiring the approval of the commission before increased tariffs could be filed went into effect). The tariffs on grain and grain products, live stock and dressed meats, petroleum and products, and certain miscellaneous commodities have been suspended by the commission, and hearings have been set in some instances.

The carriers desired to ask the commission if it would not be practicable and desirable to withdraw the tariffs now under suspension and postpone the hearings and then file a blanket application for permission to file new tariffs covering all the commodities on which advances were not allowed in the original decision. Mr. Patterson added that it is the opinion of the eastern carriers that any relief which will be secured by permitting these commodity rates to go into effect will be temporary only, and that it is only a question of a short time when the needs of the carriers will be brought to the attention of the commission in a "much more general and specific way."

It was stated that the tariffs, together with a statement of the reasons such as would be required under the tentative fifteenth section order, could be prepared for submission in about 60 days.

A number of representatives of shippers and of state commissioners were present, but most of them took no part. Representatives of the live stock shippers wanted the proposed live stock increases considered in a separate hearing while the roads preferred that all the rates be considered in one proceeding.

Newman Erb, president of the Ann Arbor, and Commissioner McChord, asked whether the case could not be handled by a reopening of the original case, but this was considered impracticable because of the suspension proceedings already started.

It was arranged that Mr. Randolph should put the carriers' proposals in concrete form in a letter to the commission in a few days.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The commission has issued an order relieving the carriers from the requirements of its orders of October 2, 1916, requiring carriers of Class 1 to file semi-monthly reports of freight car requirements and supply and quarterly reports of the condition of freight cars. This information is covered in the reports made by the railways to the commission on car service.

Applications from the railroads for permission to file certain tariffs naming increased rates under the amended fifteenth section of the commerce law will be considered by the commission at the informal hearing set for October 22 in their bearing on the questions to be then presented in respect of rates on petroleum and its products in Central Freight Association territory, as affected by the decision of the commission in the fifteen per cent case. The applications to be considered include the following commodities: Manufactured iron and steel, acid, aqua ammonia, coal tar, creosote, pine, rosin, turpentine, etc., chemicals, asphaltum, lye, and similar articles. The hearing is not for the purpose of receiving evidence, which will be heard at a subsequent hearing.

PERSONNEL OF COMMISSIONS

E. D. Chassell, member of the Board of Railroad Commissioners of Iowa, has resigned to become secretary-treasurer of the Farm Mortgage Bankers' Association of America, with headquarters in Chicago.

COURT NEWS

Additional Receiver for Missouri, Kansas & Texas Denied

Judge William C Hook, presiding in the United States District Court for the Eastern Division of the Eastern District of Missouri, on Tuesday denied the petition of Speyer & Co., New York, for the appointment of an additional receiver for the Missouri, Kansas & Texas Railway, on the ground that the motion was based on criticisms of the management of the road which were not sustained.

"The grounds of the motion," said Judge Hook, "may be grouped under two heads.

"First—Criticisms of the management of the property by the present receiver. These, the court finds, have not been sustained by the proof and arguments presented. Second—That the attitude of the receiver towards the future of the property is too conservative; that he is not in accord with expert estimates of future earnings and costs and economies of operation, etc.; that he has wrongfully assumed the function of an expert adviser of those who have undertaken to formulate a plan of reorganization, and has impressed upon them his insufficient views of the earnings capacity of the railroad, with the result that a proposed plan, based on estimated lower earnings, makes the interest on the new securities to be issued for the junior securities mentioned, contingent instead of fixed or absolute. But it does not appear that in expressing his views the receiver has exceeded the limitations or proprieties of his position, or that he intended to impress them upon those engaged on the plan of reorganization. He appears to have done little more than to give his opinion when it was sought. Furthermore, counsel for those at work upon the plan of reorganization says its terms so far as formulated are not based on anything the receiver has said or on any estimate he has given. But aside from all this, most of the objections made relate to future conditions about which skilled and competent men may widely differ. They are generally too conjectural to afford a fair basis for personal condemnation. The motion should be denied.

"But lest the position of the Court upon the general subject discussed at the hearing be misconstrued, it should be said that so far as it can legally do so, it will favor a plan of reorganization based on a conservative estimate of the future and so soundly framed as to withstand the dangers of financial and commercial stress. It will not encourage a plan of reorganization having no

adequate provision for future capital requirements or one in which the refinancing is so close to probabilities that earnings are likely to be absorbed in a lean year or a succession of them by fixed charges. The last reorganization of this company is an example of insufficient provision for necessary new capital and it is one of the efficient causes of the present receivership. While a particular class of bond or note holders should not be denied the intrinsic value of their pledged security in its proper relation to the property as a whole, whether they should continue to have interest as a fixed and absolute charge or whether it should be contingent upon the proved prosperity of the railroad is a question of broad business policy in which they are not alone concerned. The very worth of the reorganization may be affected by it. Moreover, the public, though not a party to the record, has an interest in every railroad reorganization, accomplished by foreclosure, of which the court should take notice. The ability of a railroad fully and promptly to discharge its duties to the public, and that is of primary concern, depends in great measure upon the free margin between net income and fixed charges. In practice, when the margin becomes small, or disappears under adverse conditions that are rarely discounted sufficiently, the insistent demands of contract obligations are always met at the expense of those of a more general, less definite character."

Hours of Service Act—Telegraph Operators

A telegraph operator, whose regular period of service was from 3:30 p. m. to 12:30 a. m. each night, was directed to remain on duty to care for the United States mails, which were to be delivered to and received from a passenger train scheduled to pass the station at 10:15 p. m. The train on this particular evening was known to the railroad company's officers to be 2½ hours late at a somewhat distant station, and it had been losing instead of gaining time. There was another employee at the station, who was under no restriction as to hours of service, but he was not bonded, and the railroad company made no effort to have him care for the mails. The Circuit Court of Appeals, Eighth Circuit, on appeal from the district court for the Western District of Oklahoma, holds that notwithstanding the company's expectation that some of the lost time would be made up, and despite the fact that there was a considerable margin between the operator's hours and the scheduled time for the trains, the railroad company was guilty of violation of the Hours of Service Act in requiring its operator to remain on duty more than 9 hours, for, if it desired a bonded employee to handle the mail, it should have a sufficient supply of such help subject to call. *Atchison, T. & S. F. v. United States*, 243 Fed. 114. Decided April 9, 1917.

Exchange of Services Between Railroad and Telegraph Companies

In 1887 a railroad company and a telegraph company entered into an agreement for the exchange of "on line" business and "off line" business. At stated periods the amount of "off line" business done by each for the other was ascertained and balances discharged at rates fixed at one-half of the ordinary rates. This contract is still unattacked except as to "off line" business. This feature may be summarized as follows: The railroad company transports men and material for the telegraph company, without limit, so far as the maintenance of the telegraph system on the railroad company's property is concerned. The telegraph company in turn transmits messages along the railroad company's line, also without limit, so far as the maintenance and management of the railroad is concerned; and each company further serves the other with regard to that other's business in respect of business not directly connected with the line of railroad along which the telegraph lines extend. These two kinds of work are commonly known, the former as "on line" business, the latter as "off line" business. In an action by the railroad against the telegraph company, in which the real contest was between these two companies on the one side and the Interstate Commerce Commission on the other, the sole question was whether under the Interstate Commerce Act it was lawful for the two companies to observe such a contract [as regards off line business]. The law says that nothing shall be construed to prevent telephone, telegraph and cable companies from entering into contracts with common carriers for the exchange of services. The Circuit Court of Appeals, Second Circuit, holds that, in the absence of fraud, the right to exchange implies the right to fix the rate, method, or amount of exchange. The agreement being

to exchange the carriage of goods against transmission of intelligence, each party has the further right to fix the value of the services of each to the other; it makes no difference whether for convenience they ascertain that value by the usual money measurement or adopt some other course. If it were shown that this contract or any other agreement were being used as a cover for injuring one party or the public other rules would apply.—*B. & O. v. Western Union*, 242 Fed. 914. Decided May 8, 1917.

Transportation of Intoxicating Liquors

In 1915 a brewing company obtained a temporary injunction restraining the Rock Island from refusing to accept shipments of malt liquor to go into Iowa, intended for private consumption (215 Fed. 672. District Court, D. Minnesota). It was there held that the Webb-Kenyon law does not prevent the transportation of such liquor from one state to another where it is intended for the personal use of the consignee, though in violation of the law of his state which requires the consignee to have a permit. This decree has now been reversed by the Circuit Court of Appeals, Seventh Circuit, with directions to dismiss the bill. It is held that, though the Iowa statute prohibits merely the transportation or conveyance of intoxicating liquor, the receipt of the liquor from the carrier is a violation of the law, so as to bring the transportation of the liquor by an interstate carrier within the condemnation of the Webb-Kenyon Act, since, while the recipient of the liquor may not, as such, be a violator of the law, his receipt of the liquor from the carrier necessarily involves the violation of the law by the carrier.

The court in its opinion called attention to the Postal Department Appropriation Act of March 3, 1917, and to Resolution No. 57 of March 4, 1917. This act forbids the interstate transportation of intoxicating liquors into any State the laws of which prohibit the manufacture or sale therein of intoxicating liquors for beverage purposes.—*Hamm Brewing Co. v. Rock Island*, 243 Fed. 143. Decided April 10, 1917. Rehearing Denied, May 31, 1917.

The State of Washington sought to confiscate a carload of whisky found on a side track at Meadowdale station, on the Great Northern, as being there in violation of the state liquor law. The whisky had been delivered to the railroad at Butte, Mont., with instructions to ship it to a named consignee at Ketchikan, Alaska, via the Great Northern to Meadowdale, in care of a named motor truck company. A bill of lading was issued conforming to these instructions. There was no auto truck line running from Meadowdale to Ketchikan, nor any boat line. Practically all freight for Alaska carried by the Great Northern is unloaded in Seattle and forwarded thence by boat. There was no permit on the whisky as required for liquor brought into Washington. The road informed the consignor that it could not deliver such shipments to a motor truck company, but only to a water carrier, and directed the agent to hold the shipment. At this juncture the liquor was seized by the state sheriff. The railroad filed its claim for freight to Meadowdale and also averred that the shipment was interstate and not subject to the state laws. The lower court found the shipment was not in bona fide interstate commerce, but was intended for unlawful disposition in the state. The Supreme Court of the state holds that the shipment was interstate. It was the railroad's duty to receive the whisky at Butte, unless it knew that it was intended to be diverted for delivery within the state of Washington, where it would be contraband if not protected by permit. Regardless of the state statute casting the burden upon the person claiming the article seized, the burden was held to be on the state to prove that the shipment was in fact not interstate, in view of section 24 of the act, providing that the prohibitory provisions "shall not apply to shipments transported by any common carrier of unbroken packages of intoxicating liquor in continuous transit through this state from a point outside of the state to another point outside of the state." The railroad was held not bound to deliver the liquor to an irresponsible auto delivery company within the state, but had the right to cause a deviation from the designated route. There must be something more than mere suspicion to justify the seizure and confiscation of liquors while in possession of a common carrier as an interstate shipment. The evidence was held insufficient to support a finding that the railroad was violating the state law, and judgment for the state was reversed.—*State v. Great Northern* (Wash.), 167 Pac. 103. Decided August 29, 1917.

Equipment and Supplies

LOCOMOTIVES

THE FRENCH GOVERNMENT is reported as having placed orders through the United States Government for 640 locomotives.

THE ILLINOIS CENTRAL, noted in last week's issue as about to issue inquiries for 85 locomotives, will ask prices on 50 Mikado, 21 switching and 4 hump-yard locomotives.

THE PENNSYLVANIA EQUIPMENT COMPANY, 1420 Chestnut street, Philadelphia, wants a second-hand six-wheel switching or Mogul type locomotive with 18 x 24 in. cylinders, a weight of 112,000 lb., with a tractive effort of 24,000 lb., and steam pressure of 165 lb.

FREIGHT CARS

SPENCER KELLOGG & SONS, Buffalo, N. Y., are enquiring for 10 8,000-gal. tank cars.

THE UNION PACIFIC is reported as contemplating the purchase of 5,000 freight cars.

THE BALTIMORE & OHIO will purchase material for 100 caboose cars which it will build in its own shops.

THE AMERICAN STEEL & WIRE COMPANY has ordered a scale test car from the American Car & Foundry Company.

THE FRENCH GOVERNMENT is reported as having placed orders through the United States Government for 9,000 cars with a number of car builders.

THE CENTRAL OF GEORGIA will build about 200 freight cars in its own shops, these being a part of the order mentioned as contemplated in last week's issue.

THE ILLINOIS CENTRAL, reported in last week's issue as about to issue inquiries for 3,500 freight cars, now expects to build from 700 to 1,000 of these cars in its own shops.

THE RUSSIAN GOVERNMENT which was expected to have placed an order last week for 10,000 four-wheel cars has now issued another inquiry for 1,000 eight-wheel cars and may buy as many as 30,000 cars in all.

THE NEW JERSEY LINE COMPANY.—Through a typographical error a company by this name was reported in last week's issue as inquiring for 50 gondola cars. This name should have been given as the New Jersey Zinc Company.

THE NATIONAL TUBE COMPANY has issued inquiries for 10 100-ton skelp cars, 50 70-ton hopper, 50 70-ton coke, 245 70-ton gondola, 15 70-ton flat and 30 50-ton steel dump-car bodies for the Lake Terminal Railroad; 30 70-ton hopper, 4 70-ton gondola and 12 70-ton flat cars for the McKeesport connecting, and 40 70-ton hopper and 14 70-ton gondola cars for the Benwood & Wheeling. This inquiry is similar to the one issued last April, on which, however, no orders were placed at that time.

PASSENGER CARS

THE CENTRAL OF GEORGIA, reported in last week's issue as about to issue an inquiry for passenger cars, has ordered 16 such cars from the Pullman Company.

IRON AND STEEL

THE PENNSYLVANIA RAILROAD has ordered 1,000 tons of bridge steel from the American Bridge Company.

COMMERCE OF ALASKA WITH THE UNITED STATES.—The movement of merchandise between Alaska and the United States reached its highest record in the fiscal year ended June 30, 1917, aggregating practically \$100,000,000 in round numbers. The exact figures are \$99,765,908 in 1917, exceeding the trade in 1916, the previous high year, by 23¼ million dollars, and more than double the trade in 1915, which amounted to \$48,702,387.

Supply Trade News

C. W. Cross has been appointed district manager of the Oxweld Railroad Service Company with office at 233 Railway Exchange, Chicago.

H. F. Bardwell has been appointed New York district manager for the Vanadium-Alloys Steel Company of Pittsburgh and Latrobe, Pa., with offices at 30 Church street, New York.

A. G. Shaver has been retained as consulting engineer by the A. G. A. Railway Light & Signal Company, Elizabeth, N. J. Mr. Shaver's headquarters will be room 857, Peoples Gas Building, Chicago.

Edmund Barany, machine designer of the Singer Manufacturing Company, Elizabeth, N. J., has assumed the duties of mechanical engineer and assistant to general superintendent of the Cleveland Twist Drill Company.

Signal Companies' Publicity Bureau

The four principal signal manufacturing companies—the Union Switch & Signal Company, the General Railway Signal Company, the Federal Signal Company and the Hall Switch & Signal Company—have joined in establishing a single publicity bureau, with headquarters at 120 Broadway, New York; and Henry M. Sperry, for the last three years with the General Railway Signal Company as manager of its department of publicity has been appointed publicity representative of the four companies.

Henry Muhlenberg-Sperry was born in Baltimore, Md., and educated in Philadelphia. He entered railway service in August, 1881 on the Pennsylvania Railroad in the engineer corps of the New York division. In 1887 he was appointed supervisor of signals of this division and had charge of the construction of a large number of interlocking plants required by changing the line from Philadelphia to New York from a two-track to a four-track road. In December, 1891, he left the road and went to the Johnson Railroad Signal Company as general agent, in which position he had general charge of block signal construction on the Hudson division of the New York Central. In June, 1894, he was appointed signal engineer and agent for the National Switch & Signal Company in charge of the western district. Here he designed and installed the large interlocking plant at State Line, Ind., and the signaling of the Chicago Elevated railroads, including the Union Loop. In January, 1899, he was appointed signal engineer and agent for The Union Switch & Signal Company, at New York. While in this position he prepared plans and made a report on the reconstruction of the St. Paul Union Depot, St. Paul, Minn., to provide track facilities for ten roads; he also prepared the preliminary plans and method of signaling for the first New York subway (the Interborough Rapid Transit Company). In February, 1905, he was appointed consulting signal engineer for the Hudson Companies, New York, and prepared plans and reports covering the four tunnels under the Hudson River and the large terminal station at Church street, New York, designed to handle 60,000 passengers an hour. In February, 1906, he was appointed resident manager for the General Railway Signal Company, at New York, and on January 1, 1910, was appointed sales manager at Rochester. From November 1, 1914, he has been manager of the department of publicity



H. M. Sperry

and education of that company, but for the past nine months has been engaged in the preliminaries connected with his present position as publicity representative of the four companies.

Mr. Sperry has also been a director of the National Railway Appliances Association since 1911, and in March, 1916, was elected its president. He is a member of the American Society of Civil Engineers, the American Railway Engineer Association, and the Railway Signal Association.

Emil Tyden, inventor of the Tyden car seal and vice-president of the International Seal & Lock Company, Chicago, has been commissioned a major in the army and assigned to the ordnance section, located at Washington, D. C.

L. F. Wilson, vice-president of the Bird-Archer Company, Chicago, has been called into active service with the Second division of the regular army at Chicamauga Park, Ga., with the rank of major in the quartermaster corps.

Berry Brothers, varnish manufacturers, Detroit, Mich., have prepared an illustrated folder containing instructions on how to recognize military insignia, together with a full page half-tone display of the various marks of rank and distinction in the army and navy.

The Ward Leonard Electric Company, Mount Vernon, N. Y., manufacturers of electric-controlling devices and vitreous enamel insulation resistance units, announces that it is now represented in Cleveland, Ohio, by the Walter P. Ambos Company, with offices in the Arcade.

At a meeting of the directors of the Lima Locomotive Works, Inc., October 17, a semi-annual dividend of 3½ per cent was declared on the preferred stock, payable October 31 to stockholders of record October 24. The number of directors was increased from seven to eleven.

The Taylor Wharton Iron & Steel Company, Easton, Pa., celebrated the 175th anniversary of its organization at High Bridge, N. J., on Saturday, October 13. The program of the day included an inspection of the plant, a historical pageant, a clam bake and a concert during the day and evening.

H. E. Gifford, Jr., has been appointed northwestern representative of the A. G. A. Railway Light & Signal Company, Elizabeth, N. J. Mr. Gifford has been connected with the signal business for about 12 years, in which time he has gained a varied experience both in railway and supply work. His headquarters will be room 857, Peoples Gas Building, Chicago.

John J. Harty, vice-president and general manager of the Canadian Locomotive Company, Kingston, Ont., has been elected president of the company. He is also a director of the Dominion Foundries & Steel Company and is a son of William Harty, who was, some years ago, president of the Canadian Locomotive Company and is still one of its largest stockholders.

Frank B. Archibald, for the past five years eastern manager of the National Lock Washer Company, has been elected vice-president; J. Howard Horn, eastern representative for the past seven years, has been appointed sales manager. On or about December 1, offices will be opened in Philadelphia, Pa., and St. Louis, Mo., these in addition to present offices in Chicago and Detroit, Mich.

Westinghouse Electric & Mfg. Company Announces Wage Increase

Another increase in wages for shop employees aggregating nearly \$2,000,000 a year has just been announced by the Westinghouse Electric & Manufacturing Company. Effective October 16, all employees observing shop hours, except munition workers, will receive an additional bonus of 10 per cent if they are on a salary or time-rate basis, and of 7 per cent if they are on a piece, premium or task basis.

TRADE PUBLICATIONS

TRADING WITH THE ENEMY ACT.—The American Steel Export Company has issued a new 24-page pamphlet giving the groups of countries and lists of materials affected by the President's proclamation and subsequent orders, together with facsimiles of forms prescribed and an explanation of their use.

Railway Construction

CHICAGO SHORT LINE.—This company has begun the construction of a one-story engine and car repair shop with basement at South Chicago, Ill. The building will be a brick structure, 120 ft. by 150 ft., and will cost about \$30,000. Freyn & Co., Chicago, have the contract.

EASTERN TRACTION.—This company is being organized to build an interurban electric line from Houston, Texas, east via Beaumont to Orange, thence south towards Lake Charles, La. The project is being promoted by Ed. Kennedy of Houston and associates. Financial support in the way of bonuses, also donations of right of way and sites for terminals are being given by the towns along the route.

GREAT NORTHERN.—This company has let a contract for grading and double-tracking between Cut Bank, Mont., and Blackfoot, 26 miles, to Porter Brothers, Spokane, Wash. The work will cost approximately \$100,000 and involves no bridge work.

The Great Northern recently commenced the construction of a freight warehouse, 60 ft. by 800 ft., on Pine street, between Eighth street and Van Slyke court, St. Paul, Minn. The building will be of brick and concrete construction, two stories high with a basement for half the length, and one story with no basement for the remainder of the length. The completed structure will cost approximately \$100,000. W. L. Johnson, St. Paul, has the contract.

GULF, COLORADO & SANTA FE.—This company will construct a reservoir at Valera, Tex., with a capacity of about 360,000,000 gal., which will require a pipe line $10\frac{1}{2}$ miles long. The dam will be of earth with a core wall through the center and a concrete spillway.

HOCKING VALLEY.—This company has authorized the construction of second track between Delaware, Ohio, and Marion, 21 miles; Crawford and Cary, 2 miles, and Le Moyne and Cummings, 4 miles, at an estimated cost of about \$1,300,000. The work will include some realignment and grade reduction, including the elimination of 3 highway grade crossings and some concrete arches. The grading will amount to about 20,000 cu. yd. per mile. A considerable portion of the work will be done by force account. No contracts have been let to date.

ILLINOIS CENTRAL.—This company has purchased land on the east side of its right of way between One Hundred and Fifty-seventh and One Hundred and Seventy-fifth streets, Chicago, and will use it for a freight yard. The total estimated expenditure for improvements, including grading, buildings and equipment, is \$1,250,000.

NEW YORK, NEW HAVEN & HARTFORD.—This company has given a contract to the Thompson-Starrett Company, New York, for building a new station at New Haven. The work is to be carried out on a cost plus percentage basis.

NORTHERN PACIFIC.—This company has started laying track on its Lake Basin branch, extending 38 miles northwest from Hesper, Mont., a station on the Great Northern about five miles north of the junction of the Great Northern and the Northern Pacific near Laurel, Mont. About 90 per cent of the grading on the line has been completed, bridges are all completed and the road expects to complete track-laying late in the fall.

PHILADELPHIA & READING.—Work has just been started on the construction of a one story addition to freight house No. 4 at the corner of Noble and New Market streets, Philadelphia, Pa. The extension will be 83 ft. wide by 129 ft. long and 20 ft. high. The structure is to have steel columns, and girders, with brick walls and timber roof, covered with slag roofing. The contractor is A. L. Carhart, Philadelphia.

SOUTHERN PACIFIC, TEXAS LINES.—The Galveston, Harrisburg & San Antonio is building a branch from Rosenberg, Tex., through Needville to Damon Mound, 21 miles. M. M. Cravens, Rosenberg, Tex., has the contract for the grading, 25 per cent of which has been completed. The work involves the handling of about 15,000 cu. yd. per mile. The line will have a maximum curvature of two degrees.

Railway Financial News

BOSTON & MAINE.—At the annual meeting of the stockholders it was voted to hold the annual meeting in future on the second Wednesday in April and to change the annual report to cover the calendar year ended December 31. The fourteen directors were re-elected.

See also New York, New Haven & Hartford.

CANADIAN NORTHERN. The agreement based on the legislation of last session whereby the government acquires the capital stock of this company will be executed shortly. The final conference between representatives of the government and of the railway will take place this week. By the terms of the legislation, when the stock is taken over it will be at a price to be fixed by arbitration. When the stock of the company passes into the hands of the government a board of directors headed by Hon. Frank Cochrane, late Minister of Railways, will be appointed to manage the Canadian Northern system. There are already three government directors on the board and they are expected to remain for the present. The arbitration board which is to determine the value of the common stock will be presided over by Sir William Meredith, while it is understood that the stockholders' arbitrator will be the Hon. F. H. Phippen, counsel of the Canadian Northern. If they fail to agree on a third arbitrator, the senior judge of the Exchequer Court will name him.

CHICAGO, ROCK ISLAND & PACIFIC.—At the annual meeting of stockholders, held at Chicago on October 11, the Amster faction succeeded in electing four directors and the opposition nine directors. The Amster directors are as follows: Nathan L. Amster, Henry Bruere, P. G. Ten Eyck, Prof. William Z. Ripley. The remaining directors are: James E. Gorman, John G. Shedd, James A. Patten, B. G. Dawes, James N. Wallace, James Speyer, Charles H. Hayden and Frederick W. Scott; and A. C. Rearick has been chosen in place of Nathaniel French, who resigned after the meeting. The articles of consolidation were amended, taking from the directors the power to amend the by-laws in any way. Hereafter the by-laws can be changed only by the stockholders.

DENVER & RIO GRANDE.—At the annual meeting directors were elected as outlined in the program announced by the Platten stockholders' committee. The election gives the Missouri Pacific faction, so called, the majority representation on the board. The Gould directors who retired were Kingdon Gould and B. B. McAlpin. The directors elected were B. F. Bush, Edward L. Brown, Harry Bronner, Arthur Coppell, George J. Gould, J. Horace Harding, George C. Haven, E. T. Jeffery, John W. Platten, Finley J. Shepard and Harrison Williams.

NEW YORK, NEW HAVEN & HARTFORD.—Judge Julius M. Mayer, in the United States District Court, has issued an order extending until February 1, 1919, the time for the sale of this company's holdings of the preferred and common stock of the Boston & Maine. Under the dissolution decree of October 17, 1914, the securities were to be disposed of by January 1, 1918.

WESTERN MARYLAND.—Stockholders at the annual meeting of the company in Baltimore authorized the issue of \$5,000,000 7 per cent three-year notes, to be dated November 1, 1917, secured by the pledge of \$6,500,000 of the road's first and refunding mortgage bonds. The creation of an authorized general refunding mortgage of \$150,000,000 was voted to provide for refunding the company's obligations and for improvement purposes.

George J. Gould retired from the board of directors and was succeeded by John N. Willys. The other directors elected were: Edward D. Adams, Maxwell C. Byers, Henry E. Cooper, Bertram Cutler, Frederick T. Gates, Carl R. Gray, Lawrence Greer, Alvin W. Kreech, Edgar L. Marston, Emery H. Smith and W. A. Wilbur.

ANNUAL REPORT

SOUTHERN RAILWAY COMPANY—TWENTY-THIRD ANNUAL REPORT

RICHMOND, VA., October 9, 1917.

To the Stockholders of Southern Railway Company:

The Board of Directors submits the following report of the affairs of the Company for the year ended June 30, 1917.

It has been a record year. The volume of revenue, of expenses and of income, as well as the extent of improvements and betterments carried through, all reached new high levels, reflecting the good and the evil of the prosperity which has come to the South. Expanding business has brought in large returns, but it has set higher than ever before, and perhaps higher than is economically warranted, the standards of expenses. Nevertheless, until business shall again contract it would seem that the South may be expected still to prosper.

The story in detail of the Southern Railway's busy year will be found in the statements of account and statistical analyses exhibited with this report. It may suffice here to submit a rapid summary.

Total revenues were \$91,368,324.97, an increase of 14.46 per cent. over the previous year. Of this there remained, after paying out 70.10 per cent. for the expenses of operation and taxes, a net operating income of \$24,331,453.30. This is equivalent to 5.97 per cent. earned upon the property investment of the Company, which is now \$407,688,151.71.

The final balance of corporate income over charges was \$12,360,161.11, a sum which exceeded by \$3,026,262.50 the like balance of last year and the previous record.

This income balance has enabled the Company to spend during the year \$10,418,687.60 for additions and betterments to and upon the property over and above the proceeds of the Atlanta & Charlotte Air Line bonds which are being applied on double-track construction.

OPERATING CONDITIONS.

The study and practice of efficiency of operation were continued, and are reflected in the fact that the average trainload and the average carload were increased; that there was a substantial decrease in the charges for loss and damage of freight; that the balance of hire of equipment is for the first time in four years on the right side of the account, and most of all, that more than seventeen million passengers were carried without loss of a passenger's life in a train accident. Operating unit costs were, however, distorted, as compared with last year, by the large increases in wages which took effect during the year, and by an unprecedented increase in the cost of fuel.

The property has been well maintained; its physical condition was never better than at the close of the year. The roadway destroyed by storms and floods in July, 1916, was restored and the entire cost of reconstruction was charged to maintenance expense for the year.

At the close of the year the percentages of equipment in bad order and awaiting repair were: freight cars 2.32 per cent., locomotives 8.40 per cent.—figures which tell their own story of preparedness.

General expenses increased with other expenses largely by reason of increases in pay to clerks and attendants and of the continuing increase in the contribution to Federal valuation. On the other hand the charges for salaries and expenses of general officers show a decrease.

Taxes again show a large increase, equivalent to 16.39 per cent. above last year. Last year, for the year include, as nearly as it has been practicable to determine, provision for the additional tax anticipated under the war revenue tax law. It is interesting, however, to note that the requirement of taxes upon the dollar of revenue has now remained constant for three years under great variations of traffic returns, being 4.17 cents in 1915, 1916 and 1917.

TRAFFIC CONDITIONS.

Freight traffic increased 3,291,636 tons, or 10.47 per cent., tons one mile increasing 14.57 per cent.; number of passengers increased 901,187, or 5.37 per cent., passengers one mile increasing 14.05 per cent.

Revenue increases were:

From Freight \$6,672,407.39 or 13.85 per cent.
Passengers 2,511,048.39 or 15.17 per cent.

The results from passenger operations are remarkable, because, when compared with the number of miles of passenger earnings, there was a substantial reduction in passenger-train miles, due in part to the elimination of excursions and of circus trains in anticipation of the war transportation demands of the government, viz:

	Earnings from Passengers.	Passenger-Train Miles.
1913-1914.....	\$19,004,782.70	18,362,757
1916-1917.....	19,061,963.83	16,174,480

Except as affected by varying crop, local and temporary conditions, which caused this year a loss of certain traffic, principally perishables, there was a substantial, steady and uniform increase of every class of traffic handled by the Company, as may be seen from the table of classified tonnage. The tonnage of merchandise continues to be substantially that of bituminous coal, each in round figures ten million tons, or 30 per cent. of the whole tonnage carried. This equivalence has been characteristic for many years and is one of the most interesting of the phenomena of Southern Railway traffic. The tonnage of merchandise produced within the States directly served by the Company the tonnage of cotton seed and its products decreased 101,184 tons, or 13.5 per cent. Increased Southern mill consumption occasioned movement from other territory of cotton more than sufficient to offset the loss in tonnage of that commodity in the South of its own territory, and to give, in fact, an increase of 72,097 tons, or 11.08 per cent.

Through the location of numerous military camps within the South, we have engaged, and in some years may expect to continue to engage, increasingly, in the transportation of supplies for account of the government. Independent of this, the business conditions in the South warrant the expectation of a healthy growth of traffic for the ensuing year.

INDUSTRIAL AND AGRICULTURAL DEVELOPMENT OF THE TERRITORY SERVED.

MANUFACTURING:

The year has been one of steady growth of Southern manufacturing. New plants completed during the year in the territory served by the Southern Railway System and associated lines were as follows:

Character.	Number.
Brick, Tile, etc.....	32
Canneries.....	23
Cheese Factory.....	23
Chemical.....	12

Character.	Number.
Cotton Seed Products, Ginneries, etc.....	30
Creameries.....	8
Fertilizer.....	7
Food and Feed.....	14
Furniture.....	45
Iron Products.....	21
Lumber.....	145
Power Development.....	12
Stones, Coal, Mineral, etc.....	97
Tannery.....	1
Textile, Clothing, etc.....	90
Woodworking.....	33
Miscellaneous.....	226
Total.....	787

The total capital invested in these new industries amounted to \$44,585,280. During the year there were additions made to 348 previously existing manufacturing establishments at a reported cost of \$17,111,370. Plants reported under construction on June 30, 1917, were 89 in number with a capital of \$8,896,500. General improvements consisting of new buildings of all kinds except those used in manufacturing, public utilities, etc., cost \$70,262,335.

The importance of the cotton manufacturing industry of the South on the lines of the Southern Railway System continues to grow. The report of the United States Census Bureau for the cotton statistical year ended July 31, 1917, shows that, during the year, the consumption of cotton in the mills in cotton producing States increased nearly eleven per cent., as compared with an increase of barely one per cent. in the mills of all other States. The consumption in the mills of cotton producing States was 1,883,748 bales, exceeding the 2,899,775 bales consumed in other States by 1,001,638 bales. The growth of cotton manufacturing in the territory served by the Southern Railway System may be said to date from 1880, in which year the consumption of cotton in the mills of cotton producing States was only 188,748 bales, and in all other States 1,381,596 bales. Since that year the increase in consumption in Southern mills has amounted to 1,967 per cent., as compared with 110 per cent. in all other States.

AGRICULTURE:

The current year is one of great prosperity for Southern farmers. With the exception of oats, which were damaged by the unusually severe frosts in the spring, yields of all crops compare most favorably with those of 1916. The September first estimates of the United States Department of Agriculture show the following comparisons for the Southern States served by the Southern Railway System:

	1917.	Increase over 1916.	Per Cent.
Cotton, bales.....	6,357,000	1,030,635	19.35
Corn, bushels.....	676,342,000	181,106,000	36.57
Wheat, bushels.....	48,686,000	676,000*	1.37
Oats, bushels.....	49,507,000	19,595,000*	28.36
Tobacco, pounds.....	915,576,000	68,117,000	8.04
Irish Potatoes, bushels.....	35,811,000	6,947,000	25.01
Sweet Potatoes, bushels.....	6,274,000	1,491,000	31.63
Apples, bushels.....	35,025,000	804,000*	2.24
Peaches, bushels.....	13,387,000	3,611,000	36.94

* Decreases.

In addition to the above crops, there have been large increases in the yields of certain crops for which statistics are not gathered by the Agricultural Department. Velvet beans are rapidly coming into prominence as a most valuable stock feed and are becoming an important agricultural asset of the South. According to a conservative estimate, 5,000,000 acres of velvet beans have been grown in the States served by the Southern Railway System this year, being an increase of at least 300 per cent. over last year. There have also been large increases in the production of soy beans and peanuts.

In the stock husbandry the South has made a new declaration of economic independence. The increased production of grain and forage crops in the South is putting the live stock industry of the territory served on a sound basis and it is rapidly developing. The importance of this fact will be apparent to any one who has studied the statistics of the imports of food, and especially of meats, into the South in the past. Our reports show the location of 8,050 pure-bred breeding cattle and 5,929 pure-bred breeding hogs on farms along our lines during the year. These figures do not represent the total pure bred, but only those that have come to the knowledge of our agricultural agents. The number of hogs would be greatly increased if figures were available covering the work of the boys' pig clubs in all of the territory. That it is not necessary for Southern farmers to go to other sections of the country to purchase pure bred stock is shown as formerly is shown by the frequency with which the names of Southern breeders are found in the lists of prize winners at the leading live stock exhibitions of the North and West as well as of the South. In co-operation with the Division of Animal Industry of the United States Department of Agriculture we are now encouraging a movement of cattle from localities in Texas, where a shortage of food is reported, to farms on our lines. While this movement includes some feeders, most of the animals are high-grade Hereford and Shorthorn cows and heifers which will be used for breeding.

Our reports show that there were planted during the year about 3,500,000 apple, peach, Satsuma orange and other fruit trees in the territory served by the Southern Railway System and associated lines.

We have encouraged our cooperative work in aid of the agricultural development of the territory during the year. Special attention again has been given to aiding farmers to find profitable markets for their products. Letters received from many of those who avail themselves of our service show that it is most helpful and is highly appreciated. One of its results is to encourage farmers to produce in larger quantities products which they have been able to market successfully, thus increasing the volume of our traffic.

IMMIGRATION:

The relatively low prices of farm lands, in proportion to their productive value, in many parts of the South, and the climatic advantages of the territory, after strong inducements for the migration of farmers from more densely populated and less favored parts of the country. The movement of Northern and Western farmers to the South is constantly going on and we hope to make more help and solicitation in the future. One of its results is to encourage farmers to produce in larger quantities products which they have been able to market successfully, thus increasing the volume of our traffic.

being trained and erroneous ideas about the South that they may have will be corrected. As a means of aiding in their education and creating a desire to establish in the South after the war, we are distributing literature in the camps giving facts about the South and its agricultural and industrial opportunities.

THE ADDITIONS TO CAPITAL ACCOUNT AND TO PROPERTY INVESTMENT.

PROPERTY INVESTMENT:

The investment in road and equipment increased \$12,781,279.71, representing additions made during the year, exclusive of expenditures, amounting to \$8,410,921.70, for double-track on the Atlanta & Charlotte Air Line Railway. This investment represents additions provided to take care of an expanding traffic and Letterman for greater efficiency and economy of operation. The success of the Company in handling during the past year a record traffic easily and without congestion, so building its income balance, may fairly be attributed to the liberal policy of enlarging the plant which has been followed during the past few years.

DOUBLE TRACK:

Of the 649 miles of main line between Washington, D. C., and Atlanta, Ga., 521 miles are now double-track on improved alignment and grades, and the work is progressing on the remaining 128 miles. The incomplete work is south of Charlotte, N. C., and additional funds for carrying it on were made available through the sale during the past year of the remaining \$4,000,000 thirty-year five per cent. bonds of The Atlanta & Charlotte Air Line Railway Company provided for issue under the First Mortgage of that Company.

Southern Railway Company now operates a total of 820 miles of double-track railroad.

NEW ORLEANS AND NORTHEASTERN RAILROAD:

Southern Railway Company has acquired substantially all of the capital stock of New Orleans and Northeastern Railroad Company, which owns the railroad extending from New Orleans, La., to Meridian, Miss., there connecting with other lines of Southern Railway System. This stock was held for many years by an English investment company known as the Alabama, New Orleans, Texas and Pacific Junction Railways Company, Limited, and its purchase was made possible through the wish of the Directors and other security holders of the English company to assist the British Government in securing American exchange. The English company owned also the controlling stocks of the Alabama and Vicksburg Railway Company and the Vicksburg, Shreveport and Pacific Railway Company, representing the railroad extending from Meridian westerly to Shreveport, La., and as Southern Railway Company, as a part of the transaction, disposed of its minority holding of the stock of the English company acquired in 1905, it has parted with all interest in the Alabama and Vicksburg and the Vicksburg, Shreveport and Pacific. The acquisition of the New Orleans and Northeastern Railroad stock secures to Southern Railway Company a direct entrance into New Orleans as well as physical connection with its extensive terminals at that port.

BONDS AND NOTES:

There was no increase in mortgage bonds outstanding. Equipment trust obligations increased \$2,059,000.

There were drawn, and taken into the treasury, \$10,675,000 Development and General Mortgage four per cent. bonds. Of these bonds \$10,000,000 were drawn, under the terms of the mortgage, for additions and betterments, and the remaining \$675,000 were drawn for the proportion charged to capital of certain equipment trust obligations paid during the year. The total amount of Development and General Mortgage four per cent. bonds available for disposition on June 30, 1917, was \$49,149,000, of which \$44,250,000 are pledged as collateral for notes.

A comprehensive plan for financing existing and future requirements of capital, including the funding of short term notes, through the creation of a new mortgage to be called the Refunding and Improvement Mortgage, was recommended by the Board of Directors and authorized by the stockholders at the meeting held on January 5, 1917, but has not been consummated because extraordinary conditions existing in the investment market prevented the sale of long term bonds on terms sufficiently advantageous to the Company to justify selling them. This made it necessary again to resort to short term notes, and there were issued and sold \$25,000,000 two-year five per cent. notes dated March 2, 1917, payable March 2, 1919, to provide for retiring notes to discharge the obligation incurred in the purchase of the New Orleans and Northeastern Railroad stock and to furnish a small amount of additional capital for improvements.

DIVIDEND.

A dividend of 2½ per cent. on the Preferred Stock has been declared payable on November 30, 1917, to stockholders of record at the close of business on October 31, 1917. In view of the income account the Board concluded that this dividend might conservatively be paid, in justice to the expectations of the preferred stockholders, notwithstanding the fact that there still remains unsolved the problem of permanent financing of existing and future capital requirements.

SERVICE OF EMPLOYEES.

Despite disturbed labor conditions throughout the year and acute discussions of wages, the Company has again had loyal and efficient service from its army of employees. The management has been daily reminded that whatever success has been secured is due to that co-operation and to the vigor with which work is done under the stimulus of the now established and recognized pride of the rank and file in their relation to the property.

ACCOUNTS.

The accounts have been examined, as usual, by independent auditors and accountants, Messrs. Patterson, Teale & Dennis, and their certificate is made a part of this report.

Respectfully submitted, by order of the board,

FAIRFAX HARRISON,
President.

TABLE 1.—INCOME STATEMENT FOR YEAR ENDED JUNE 30, 1917, COMPARED WITH YEAR ENDED JUNE 30, 1916.

	YEAR ENDED JUNE 30,		INCREASE OR DECREASE.
	1917.	1916.	
OPERATING REVENUES:			
Freight	\$54,863,693.57	\$47,020,481.81	\$7,843,211.76
Passenger	19,061,963.83	16,615,857.10	2,446,106.73
Miscellaneous			
Train	556,941.92	368,411.29	188,530.63
Mail	1,740,566.13	1,458,879.37	281,686.76
Express	2,348,657.61	2,037,282.86	311,374.75

	YEAR ENDED JUNE 30,		INCREASE OR DECREASE.
	1917.	1916.	
OPERATING REVENUES:			
Other Transportation	1,183,282.05	1,085,998.62	97,283.43
Incidental	1,281,941.26	1,055,146.52	226,794.74
Joint Facility	551,278.60	355,617.67	—4,339.07
TOTAL OPERATING REVENUES	\$81,388,324.97	\$69,997,675.24	\$11,390,649.73
OPERATING EXPENSES:			
Maintenance of Way and Structures	\$10,138,386.37	\$8,175,411.13	\$1,962,975.24
Maintenance of Equipment	12,372,057.35	11,183,701.34	1,188,356.01
Traffic	2,039,638.29	1,904,129.24	135,509.05
Transportation	26,748,927.79	22,751,698.00	3,997,229.79
Miscellaneous Operations	539,378.11	404,167.13	135,210.98
General	2,199,448.65	2,038,702.18	160,746.47
Transportation for Investment—Credit	107,700.40	416,693.58	8,993.18
TOTAL OPERATING EXPENSES	\$53,630,136.16	\$46,041,116.12	\$7,589,020.04
NET REVENUE FROM OPERATIONS	\$27,758,188.81	\$23,956,559.12	\$3,801,629.69
TAXES	3,394,424.14	2,916,426.65	477,997.49
UNCOLLECTIBLE REVENUES	32,311.37	36,127.38	—3,816.01
TOTAL OPERATING INCOME	\$24,331,453.30	\$21,004,005.09	\$3,327,448.21
NON-OPERATING INCOME:			
Hire of Equipment—Credit Balance	\$65,199.28	.....	\$65,199.28
Joint Facility Rent Income	294,954.29	\$290,695.07	4,259.22
Income from Lease of Road	18,897.78	67,338.24	—48,440.46
Miscellaneous Rent Income	138,295.72	136,225.82	2,069.90
Net Income from Rail Leases	36,343.65	24,077.44	12,266.21
Dividend Income	1,220,890.33	1,271,256.09	—50,365.76
Income from Funded Securities	950,381.90	1,106,342.69	—155,960.79
Income from Unfunded Securities and Accounts	364,308.55	479,746.72	—115,438.17
Miscellaneous Income	32,023.37	46,344.02	—14,320.65
TOTAL NON-OPERATING INCOME	\$3,121,294.87	\$3,422,026.09	—\$300,731.22
TOTAL GROSS INCOME	\$27,452,748.17	\$24,426,031.18	\$3,026,716.99
DEDUCTIONS FROM TOTAL GROSS INCOME:			
Hire of Equipment—Debit Balance .....	.....	\$679,354.69	—\$679,354.69
Joint Facility Rents	\$1,056,833.97	1,054,240.57	2,593.40
Rent for Leased Roads	1,939,066.63	1,778,527.90	160,538.73
Miscellaneous Rents	50,179.48	40,663.98	9,515.50
Separately Operated Properties	464,695.83	189,317.85	275,377.98
Interest on Unfunded Debt	70,033.26	623.69	69,409.67
Miscellaneous Income Charges	128,562.87	143,175.16	—14,612.29
TOTAL DEDUCTIONS OF THIS CLASS	\$3,709,372.04	\$3,885,903.74	—\$176,531.70
TOTAL AVAILABLE INCOME	\$23,743,376.13	\$20,540,127.44	\$3,203,248.69
INTEREST ACCRUED ON FUNDED DEBT (Table 5)	\$10,496,292.24	\$10,329,591.67	\$166,700.57
INTEREST ACCRUED ON EQUIPMENT OBLIGATIONS (Table 6)	660,914.78	650,629.16	10,285.62
DIVIDENDS ACCRUED ON SOUTHERN RAILWAY—MOBILE AND OHIO STOCK TRUST CERTIFICATES	226,008.00	226,008.00	.....
TOTAL DEDUCTIONS OF THIS CLASS	\$11,383,215.02	\$11,206,228.83	\$176,986.19
BALANCE OF INCOME OVER CHARGES	\$12,360,161.11	\$9,333,898.61	\$3,026,262.50
RESERVE FOR 2½% DIVIDEND ON PREFERRED STOCK, PAYABLE NOVEMBER 30, 1917	1,500,000.00	.....	1,500,000.00
APPROPRIATION OF INCOME FOR ADDITIONS AND BETTERMENTS	181,401.72	88,195.03	93,206.69
BALANCE CARRIED TO CREDIT OF PROFIT AND LOSS	\$10,678,759.39	\$9,245,703.58	\$1,433,055.81
TABLE 2.—PROFIT AND LOSS YEAR ENDED JUNE 30, 1917.			
Credit Balance June 30, 1916			\$28,248,594.78
Add:			
Credit Balance of Income for the Year			10,678,759.39
Net Miscellaneous Credits			8,291.23
			\$38,932,645.40
Deduct:			
Discount on Securities charged off during the year			\$845,461.36
Net difference between book value and selling price of securities sold			610,958.24
Property abandoned and not Replaced			58,941.75
Advances to Proprietary Companies written off			\$52,034.84
			1,867,396.19
Credit Balance June 30, 1917			\$37,065,249.21

TABLE 3.—GENERAL BALANCE SHEET, JUNE 30, 1917, COMPARED WITH JUNE 30, 1916.

ASSETS.			LIABILITIES.		
	JUNE 30, 1917.	JUNE 30, 1916.		JUNE 30, 1917.	JUNE 30, 1916.
INVESTMENTS:			CAPITAL STOCK:		
Investment in Road.....	\$336,271,268.36	\$329,388,356.42	Common	\$120,000,000.00	\$120,000,000.00
Investment in Equipment.	71,416,883.35	65,518,515.58	Preferred	60,000,000.00	60,000,000.00
Total Investment in Road and Equipment.	\$407,688,151.71	\$394,906,872.00	Total Southern Railway Company Stock.....	\$180,000,000.00	\$180,000,000.00
Cash Deposited in Lieu of Mortgaged Property Sold	\$23,341.00	.....	Southern Ry.-Mobile & Ohio Stock Trust Certificates.	5,650,200.00	5,650,200.00
Physical Property—Rails and Fixtures leased to others	607,979.51	\$524,304.70	Total Stock	\$185,650,200.00	\$185,650,200.00
INVESTMENTS IN AFFILIATED COMPANIES:			LONG TERM DEBT:		
Stocks	\$33,364,993.80	\$26,736,304.49	Funded Debt (Table 5)	\$235,391,500.00	\$226,850,500.00
Bonds	28,062,459.04	28,021,459.04	Equipment Trust Obligations (Table 6)	19,494,000.00	17,435,000.00
Notes	1,852,822.60	2,237,573.57	Total Long Term Debt	\$254,885,500.00	\$244,285,500.00
Advances	2,366,587.35	1,999,719.29	Total Capital Liabilities	\$440,535,700.00	\$429,935,700.00
Miscellaneous (Matured interest coupons)	43,925.00	51,455.00	GOVERNMENTAL GRANTS:		
Total Investments in Affiliated Companies	\$65,690,787.79	\$59,046,511.39	Grants since July 1, 1914, in aid of Construction..	\$69,269.72	\$31,668.16
OTHER INVESTMENTS:			CURRENT LIABILITIES:		
Stocks	\$298,171.00	\$1,695,693.58	Loans and Bills Payable..	\$455,000.00	\$455,000.00
Bonds	5,264,346.78	5,169,380.03	Traffic and Car Service Balances	2,206,751.24	1,580,388.41
Notes	525,383.42	63,909.42	Audited Accounts and Wages	8,330,798.98	6,150,180.05
Advances for purchase of Additional Equipment	6,001,882.75	5,633,029.65	Miscellaneous Accounts ..	924,493.69	719,561.36
Total Other Investments	\$12,089,783.95	\$12,562,012.68	Interest Matured, Including interest due July 1.	2,875,317.65	2,818,680.65
Total Investments	\$486,100,043.96	\$467,039,700.77	Funded Debt Matured—Unpaid	24,673.80	40,773.80
CURRENT ASSETS:			Dividends Accrued—Unmatured	56,502.00	56,502.00
Cash	\$7,553,094.36	\$7,127,172.20	Interest Accrued—Unmatured	1,686,818.18	1,572,760.05
Time Deposit	1,964,069.84	1,906,448.05	Rents Accrued—Unmatured Expenses Accrued not vouchered	309,475.66	203,404.12
Special Deposits	3,079,036.45	3,028,298.45	Other Current Liabilities.	1,700,200.49	1,470,638.10
Loans and Bills Receivable	1,146,349.90	570,260.54	Total Current Liabilities	\$19,328,849.41	\$15,715,797.34
Traffic and Car Service Balances Receivable	1,933,010.32	1,298,226.89	DEFERRED LIABILITIES:		
Balances due from Agents and Conductors	807,434.12	145,419.51	Deferred Payments Account Reconstruction Rogersville Branch; Contractors' Per Cents. Retained and Sundry Items	\$917,029.96	\$633,341.60
Miscellaneous Accounts Receivable	6,841,939.81	4,533,206.69	UNADJUSTED CREDITS:		
Material and Supplies (Table 12)	9,309,593.02	6,813,172.27	Taxes	\$1,539,079.49	\$1,051,619.99
Interest and Dividends Receivable	577,558.16	667,411.94	Insurance Reserve	1,078,561.12	1,133,469.42
Other Current Assets	527,130.80	276,625.18	Operating Reserves	3,867,659.33	3,289,779.83
Total Current Assets.	\$33,739,216.78	\$26,366,241.72	Car and Ticket Mileage Suspense	960,642.04	700,219.12
DEFERRED ASSETS:			Depreciation accrued on:		
Working Funds Advanced to Agents and Officers.	\$392,251.68	\$241,776.27	Rail Leased to Other Companies	87,141.56	81,819.37
Liberty Bonds—Subscribed for employees	256,500.00	.....	Equipment Owned	16,241,089.25	15,472,168.77
Cash and Securities in Insurance Fund	1,078,561.12	1,133,469.42	Equipment Leased from Other Companies	319,394.78	244,196.99
Other Deferred Assets	152,594.25	183,992.19	Sundry Items	615,360.66	559,276.05
Total Deferred Assets	\$1,879,907.05	\$1,559,237.88	Total Unadjusted Credits	\$24,708,923.23	\$22,532,549.54
UNADJUSTED DEBITS:			CORPORATE SURPLUS:		
Insurance Premiums and Rents paid in advance..	\$26,029.87	\$13,243.96	Additions to Property, since June 30, 1907, through Income and Surplus	\$1,120,288.71	\$790,020.62
Unextinguished Discount on Funded Debt (Proportion chargeable to Additions and Betterments to be made)	182,434.60	120,655.96	Reserve for 2½% Dividend on Preferred Stock	1,500,000.00	.....
Additions and Betterments Expenditures: Freight Claims; Foreign Mileage and Sundry Items in Suspense	3,318,187.26	2,848,803.56	Miscellaneous	504.28	60,211.81
Total Unadjusted Debits	\$3,526,651.73	\$2,982,703.48	Total Appropriated Surplus	\$2,620,792.99	\$850,232.43
Securities of the Company held by it:			PROFIT AND LOSS—Balance	37,065,249.21	28,248,594.78
1917. 1916.			GRAND TOTALS	\$525,245,819.52	\$497,947,883.85
Unpledged \$5,095,200	\$13,403,200				
Pledged .. 44,250,000	28,267,000				
Totals.	\$49,345,200	\$38,670,200			
GRAND TOTALS	\$525,245,819.52	\$497,947,883.85			

[Adv.]

Railway Officers

Executive, Financial, Legal and Accounting

W. C. Mitchell has been appointed vice-president of the Susquehanna & New York, with office at New York.

W. E. Welch, superintendent of the Ft. Smith & Western, has been appointed assistant to the receiver, with office at Ft. Smith Ark.

J. D. Watson, assistant to the first vice-president of the St. Louis Southwestern, has been appointed assistant to the president, with office at St. Louis, Mo.

J. T. Freeman has been appointed auditor and general freight and passenger agent of the Brownwood North & South, with office at Brownwood, Tex., succeeding H. M. Grizzard.

M. K. Stephens, in addition to his duties as auditor of the Anthony & Northern, has assumed the position of traffic manager, in place of R. H. Singleton, with office at Hutchinson, Kan.

J. M. C. Usher has been appointed auditor and treasurer of the Sapulpa & Oil Field, with office at Tulsa, Okla., succeeding T. D. Trickey, auditor, and R. S. Homsher, treasurer and traffic manager.

F. W. Charske, anditor of freight accounts of the Union Pacific at Omaha, Neb., has been appointed auditor of the Oregon Short Line to succeed L. R. Wood, who is assigned to other duties with the system.

L. R. Smith has been appointed auditor of station accounts of the Great Northern, and H. F. Bayer, anditor of miscellaneous accounts, with headquarters at St. Paul, Minn., succeeding A. B. Fisher, promoted.

E. B. Barber, treasurer of the Algona Central & Hudson Bay at Sault Ste. Marie, Ont., has been appointed controller, and J. M. Alton has been appointed treasurer. Both with offices at Sault Ste. Marie, Ont.

F. B. Longfield, chief clerk of freight receipts of the Chicago Great Western, has been appointed auditor of freight receipts, with headquarters at Chicago, Ill., to succeed W. J. Cunningham, resigned to become general accountant on the Illinois Central at Chicago.

William E. Lamers has been appointed assistant auditor of the New York, Chicago & St. Louis, with headquarters at Cleveland, Ohio, succeeding James E. Baldwin, resigned. H. S. Lewis, commercial agent at Toledo, Ohio, has been appointed district freight agent at the same place. J. B. Fletcher succeeds Mr. Lewis.

Operating

G. S. Whybark, chief despatcher, has been appointed superintendent of the Arkansas Central, with office at Ft. Smith, Ark.

R. B. Croll, superintendent of car service of the Ft. Smith & Western, has been appointed superintendent in charge of car service, train and station service, with headquarters at Ft. Smith, Ark.

R. McIntyre has been appointed assistant to the vice-president and general manager of the Southern Pacific, Pacific System, in charge of wage schedules, with headquarters at San Francisco, Cal.

H. S. Baumgardner has been appointed superintendent of transportation of the Missouri & North Arkansas, with jurisdiction over train operation and station service, with headquarters at Harrison, Ark.

J. W. Daniels has been appointed superintendent of the Arkansas division of the Missouri Pacific, with headquarters at Little Rock, Ark., succeeding C. L. Mayne, assigned to other duties; effective October 10.

C. E. Hair, assistant secretary of the Chicago, Terre Haute & Southeastern, has been appointed assistant general superintendent, with headquarters at Terre Haute, Ind., and C. V. Link has been appointed assistant superintendent at Bedford, Ind.

L. S. Brown, assistant general superintendent of the eastern lines of the Canadian Government Railways, has been appointed general superintendent of the eastern lines with office at Moncton, N. B., vice J. K. McNeillie, resigned to go to another company.

H. B. Voorhees, who has been appointed general superintendent of transportation of the Baltimore & Ohio, with headquarters at Baltimore, Md., as has already been announced in these columns,



H. B. Voorhees

was born on January 22, 1876, and graduated as a civil engineer from Rensselaer Polytechnic Institute at Troy, N. Y., in 1896. He began railway work in the same year as assistant supervisor of the Philadelphia & Reading at Tamaqua, Pa., and on March 1, 1898, became supervisor. On August 1, 1898, he was promoted to assistant trainmaster, and in October, 1900, became trainmaster. He entered the service of the Baltimore & Ohio on December 1, 1901, as assistant engineer at Pittsburgh, and in August, 1902, was promoted to division engineer, with headquarters at Baltimore. He was appointed assistant to general superintendent in September, 1903, and subsequently served as superintendent and general agent of the Philadelphia division at Philadelphia, Pa., until May, 1910, when he was appointed assistant to president. On May 1, 1912, he was appointed general superintendent of the Baltimore & Ohio Southwestern and the Cincinnati, Hamilton & Dayton lines, at Cincinnati, Ohio; he later served as general superintendent of the Northwestern district of the Baltimore & Ohio, and now becomes general superintendent of transportation of the Baltimore & Ohio, with office at Baltimore, Md., as noted above.

F. M. Clark, whose appointment as superintendent of the Old Colony division of the New York, New Haven & Hartford, with headquarters at Taunton, Mass., has already been announced in



F. M. Clark

these columns, was born in Taunton, and was educated in the public and high schools. He later studied mechanical drafting in the night schools. He entered the service of the Old Colony Railroad in 1891, as agent and operator and remained in the service of that road until it was absorbed by the New York, New Haven & Hartford in June, 1893, since which time he has been continuously in the service of the New Haven. He served consecutively as agent and operator, car distributor and train despatcher until April, 1906, when he was appointed transportation clerk in the office of the assistant general superintendent at Boston, Mass., and later was appointed inspector of transportation in the office of the general superintendent at New Haven. On June 1, 1909, he was appointed acting trainmaster of the Shore Line division; the following November he was appointed trainmaster of the Providence division, remaining in that position until June, 1916, when he was appointed assistant superintendent of transportation with supervision of freight rates, and now becomes superintendent of the Old Colony division as above noted.

C. N. Clark, assistant superintendent of the Denver & Salt Lake at Denver, Colo., having been assigned to other duties, the position is abolished. F. B. Miller has been appointed trainmaster at Denver and will handle all matters heretofore under the jurisdiction of the assistant superintendent.

R. S. Marshall, superintendent of the Georgia division of the Seaboard Air Line at Atlanta, Ga., has been appointed superintendent of the Virginia division, with office at Raleigh, N. C., vice G. R. Carlton, who succeeds Mr. Marshall as superintendent of the Georgia division, with office at Atlanta.

H. B. Titcomb, maintenance of way assistant for the northern district to the assistant chief engineer of the Southern Pacific at San Francisco, Cal., has been appointed superintendent of the Stockton division, with headquarters at Stockton, Cal., succeeding C. H. Ketcham, resigned, effective October 15.

Claude B. Carpenter was appointed superintendent of the Rio Grande Southern division of the Denver & Rio Grande on October 1, succeeding F. White, acting superintendent, assigned to other duties. Mr.

Carpenter was born at Columbia, S. C., on January 11, 1874, and entered the service of the Denver & New Orleans on May 1, 1885, as an office boy in the superintendent's office at Denver, Colo. In September, 1887, he went to the Denver & Rio Grande as office boy in the general passenger agent's office at Denver, and in June, 1890, was transferred to the office of president and general manager as record clerk. On January 1, 1892, he was made record clerk in the general superintendent's office, and was subsequently stenographer, telegraph operator, transportation clerk and private secretary in the same office until 1901, when he became chief clerk. He was appointed chief clerk to the general superintendent of the Colorado & Southern at Denver, on January 19, 1903, and on August 1 of that year became chief clerk to the general manager of the Ft. Worth & Denver City, at Ft. Worth, Tex., also acting as purchasing agent. In May, 1904, he was appointed chief clerk to the superintendent of the northern division of the Colorado & Southern at Denver, and returned to the Denver & Rio Grande in May, 1906, as chief clerk to the general superintendent at Denver. From June 1, 1907, to August 1, 1913, he was chief clerk to the general manager, acting also as superintendent of car service for three years. He was appointed inspector of transportation on the latter date, and on May 1, 1914, became assistant superintendent of the fourth division, from which position he has been promoted to that of superintendent of the Rio Grande Southern division, with headquarters at Ridgway, Colo.

R. C. Andrews, superintendent of the Ft. Worth division of the Texas & Pacific at Ft. Worth, Tex., has been transferred to Marshall, Tex., as superintendent of the eastern division, succeeding W. M. Lynch. Mr. Lynch has been transferred to the Louisiana division as superintendent, with headquarters at Alexandria, La., succeeding W. H. DeFrance, who succeeds Mr. Andrews at Ft. Worth.

A. J. Witchell, engineer of tests of the Spokane, Portland & Seattle, has been appointed to the newly created position of assistant to the general superintendent, with office at Portland, Ore. G. E. Votaw, superintendent of the Great Northern, at Great Falls, Mont., has been appointed superintendent of the Portland division of the Spokane, Portland & Seattle, succeeding C. A. Vermillion, granted a leave of absence on account of ill health.

R. E. Ryan, assistant superintendent of the Minneapolis & St. Louis at Watertown, S. D., has been appointed superintendent of the central and western divisions, with office at Minneapolis, Minn., succeeding C. P. Stembel, resigned to become general

superintendent of the Virginian at Norfolk, Va. The position of assistant superintendent at Watertown has been abolished. H. McCarthy, trainmaster at Minneapolis, has been appointed assistant superintendent of the central and western divisions. F. O. Coleman has been appointed trainmaster of the western division at Watertown. The office of trainmaster of the central division at Minneapolis has been abolished.

J. W. Mulhern, formerly superintendent of the Northern division of the Chicago Great Western, has been appointed general superintendent of the Kettle Valley, a subsidiary of the

Canadian Pacific, with headquarters at Penticton, B. C. Mr. Mulhern was born at Naples, Ill., in 1863, and entered railway service with the Chicago, Burlington & Quincy at Beardstown, Ill., in 1881, serving successively as water carrier, track hand, freight trucker, freight clerk, brakeman and freight and passenger conductor until October, 1887, when he was made yardmaster of the Kansas City terminal. From January, 1890, to December, 1902, he was trainmaster at Brookfield, Mo., and on the latter date was promoted to superintendent of terminal at Kansas City, Mo. In August, 1904, he was appointed superintendent of the Hannibal-St. Louis division at Hannibal, Mo., and in December of the following year was transferred to the superintendency of the Galesburg division at Galesburg, Ill., resigning in July, 1908, to become superintendent of the Illinois lines of the Chicago & Alton at Bloomington, Ill. From May, 1910, to May, 1911, he was assistant to the second vice-president of the Western Pacific at San Francisco, Cal., and from the latter date to August, 1912, was general superintendent of the Utah lines of the Denver & Rio Grande at Salt Lake City. In November, 1912, Mr. Mulhern was appointed superintendent of the Chicago-Petoskey division of the Pere Marquette at Grand Rapids, Mich., and in July, 1914, he went to the Chicago Great Western as superintendent of the Northern division at St. Paul, Minn., which position he held until March, 1917. His appointment as general superintendent of the Kettle Valley was made on July 1.



J. W. Mulhern



C. B. Carpenter

Traffic

Robert J. Sefton has been appointed district passenger agent of the Chicago Great Western at St. Louis, Mo., in place of H. B. Bryning.

G. H. Dougherty, traveling freight agent of the Kansas City Southern at Dallas, Tex., has been appointed general agent, with office at Tulsa, Okla.

W. A. Kellond, general baggage agent of the Missouri, Kansas & Texas, has also assumed the duties of manager of mail traffic, with office at Parsons, Kan.

John D. Deets, superintendent of farming and development of the Minneapolis & St. Louis, has been appointed immigration agent at Minneapolis, Minn.

A. C. Huggins has been appointed commercial agent of the Cleveland, Cincinnati, Chicago & St. Louis at Jacksonville, Fla., succeeding R. G. Parks, resigned.

W. G. Holly has been appointed commercial agent of the Macon, Dublin & Savannah, with headquarters at Atlanta, Ga., vice E. G. Tucker, assigned to other duties.

W. R. Daniels, traveling freight agent of the Texas & Pacific at Dallas, Tex., has been appointed division freight agent at El Paso, Tex., in place of D. L. Ray. R. S. Norton has been appointed commercial agent at San Francisco, Cal., succeeding W. J. Moylan, resigned.

J. M. Gross, assistant general freight agent of the Pennsylvania Railroad, lines east of Pittsburgh, with headquarters at Philadelphia, Pa., has resigned to become general traffic manager of the Bethlehem Steel Company; F. X. Quinn, district freight solicitor of the Pennsylvania Railroad at New York City, has been appointed acting division freight agent at Buffalo, effective October 15.

J. B. Large, division freight agent of the Pennsylvania Railroad, at Buffalo, N. Y., has been appointed assistant general freight agent of the lines East of Pittsburgh, with headquarters at Philadelphia, Pa. He was born on August 18, 1882, at Philadelphia, and was educated at the Protestant Episcopal Academy, of Philadelphia, and at the Wharton School of Finance of the University of Pennsylvania. He entered the service of the Pennsylvania Railroad on October 7, 1902, as a clerk at Germantown Junction, Pa., and the following summer was transferred to the general office at Philadelphia. In May, 1906, he was promoted to traveling freight solicitor, of the Boston district and in October, 1907, was made district

freight solicitor at Providence, R. I. He was promoted in February, 1910, to freight solicitor at Reading, Pa., and on May 8, 1912, upon a change in organization of the Pennsylvania Railroad, he was appointed division freight agent of the Erie and Northern divisions with headquarters at Erie, and later served in the same capacity at Buffalo, N. Y., until his appointment as assistant general freight agent, as above noted.

Horace Hale Holcomb, general freight agent of the Chicago, Burlington & Quincy, lines west of the Missouri river, with headquarters at Omaha, Neb., has been promoted to assistant

freight traffic manager at Chicago, succeeding C. E. Spens, recently elected vice-president in charge of traffic. Mr. Holcomb was born on October 12, 1865, and entered the service of the Burlington on August 1, 1889, as a clerk in the local freight office at Chicago. In March of the following year he was transferred to the Hawthorne (Ill.) yards as rate clerk, and in May, 1891, was made chief clerk at that point. In November, 1900, he was transferred to the general freight office as tariff clerk, and on January 1, 1902, became

chief clerk to the assistant general freight agent at St. Paul, Minn. On March 1 of that year he was made chief clerk to the assistant general freight agent at Chicago, and on August 24, 1905, he was promoted to assistant to the freight traffic manager, which position he held until December, 1912, when he was appointed general freight agent, lines west of the Missouri river, with headquarters at Omaha. He remained in the latter position until his promotion to assistant freight traffic manager on October 1.

C. C. McMillin, assistant general passenger agent of the Georgia Railroad at Atlanta, Ga., has been appointed special pas-

senger agent, with office at Augusta, and J. M. Wooddall has been appointed assistant general passenger agent with office at Atlanta, succeeding Mr. McMillin. Mr. Wooddall has been appointed assistant general passenger agent also of the Atlanta & West Point and the Western Railway of Alabama.

F. B. Rowley, commercial agent of the New York Central Railroad and the New York Central Fast Freight Lines at Minneapolis, Minn., has been promoted to assistant general freight agent of the New York Central Railroad at Chicago. A. L. Evans succeeds Mr. Rowley at Minneapolis and A. C. Lawson has been appointed commercial agent at Salt Lake City, Utah, vice W. L. Greiner, promoted to westbound agent of the Merchants Despatch at Chicago.

James Paul Anderson, who has been appointed passenger traffic manager of the Pennsylvania Lines East of Pittsburgh and Erie, with office at Philadelphia, Pa., as has already been announced

in these columns, was born August 29, 1862, at Beaver, Pa. He was educated in the public schools of Beaver and Allegheny and entered the service of the Allegheny Valley Railway on July 15, 1880, as a clerk in the passenger department. After serving as chief clerk and traveling passenger agent he was appointed general passenger agent of the same road in June, 1889, and when the Pennsylvania Railroad absorbed the Allegheny Valley in August, 1900, he was appointed division ticket agent of the Buffalo and Allegheny

Valley division. On April 1, 1910, he was appointed district passenger agent of the Pittsburgh district, and on August 1, 1912, was promoted to assistant general passenger agent. In March, 1913, the passenger department of the Pennsylvania Lines East of Pittsburgh and Erie was reorganized and Mr. Anderson was promoted to general passenger agent in charge of through traffic, with headquarters at Philadelphia, Pa., which position he held until his appointment as passenger traffic manager, as above noted.

C. E. Veatch, assistant general freight and passenger agent of the Missouri & North Arkansas, has been appointed acting general freight and passenger agent, with office at Harrison, Ark., to succeed J. C. Murray, granted a leave of absence to enter an officers' training camp. W. L. Monson, commercial agent at Atlanta, Ga., has been transferred to Chattanooga, Tenn., succeeding A. A. Boyle, resigned. G. C. Murray has been appointed commercial agent at Atlanta, succeeding Mr. Monson. C. A. Morgan has been appointed commercial agent at Wichita, Kan., succeeding L. C. Williams, resigned, and E. J. Graham becomes commercial agent at New Orleans, taking the place of W. J. McMahon, resigned.

Engineering and Rolling Stock

F. W. Schultz has been appointed master mechanic of the Kansas City, Mexico & Orient of Texas at San Angelo, Tex., vice T. C. Kyle.

C. Whitfield, roadmaster of the Portland division of the Spokane, Portland & Seattle, has been appointed superintendent maintenance of way, with headquarters at Portland, Ore., the title of roadmaster having been abolished.

M. B. McPartland has been appointed master mechanic of the Denver & Salt Lake, with jurisdiction over the motive power and car departments, with headquarters at Utah Junction, Denver, Colo. D. G. Cunningham having resigned, the position of superintendent of machinery is abolished.

E. W. Smith, assistant engineer of motive power of the Pennsylvania Railroad at Altoona, Pa., has been appointed



J. B. Large



J. P. Anderson



H. H. Holcomb

master mechanic, with office at Harrisburg, succeeding C. L. McIlvaine, promoted, and C. O. Keagy, general foreman of the West Philadelphia shops, has been appointed master mechanic of the Middle division of the main line, with office at Altoona.

Charles Lee McIlvaine, master mechanic of the Philadelphia division of the Pennsylvania Railroad at Harrisburg, Pa., has been appointed superintendent of motive power of the Northern division, with headquarters at Buffalo, N. Y.

Claude M. Starke, master mechanic of the Illinois Central at McComb, Miss., has been appointed assistant superintendent of motive power of the Missouri, Kansas & Texas, with headquarters at Parsons, Kan., effective October 1. Mr. Starke was born at Water Valley, Miss., on January 15, 1878, and entered the service of the Illinois Central on April 9, 1891, as a clerk at Water Valley. He was subsequently machinist apprentice, machinist and roundhouse foreman, and was promoted to general foreman at Indianapolis, Ind., on April 1, 1909, being transferred to Champaign, Ill., in a similar capacity on September 1, 1911. He was appointed master mechanic at Water Valley on June 1, 1912, and one year later was transferred to McComb. He held the latter position until his recent appointment as assistant superintendent of motive power of the Missouri, Kansas & Texas.

Francis M. Waring, acting engineer of tests of the Pennsylvania Railroad at Altoona, Pa., has been appointed engineer of tests. He was born on September 28, 1879, at Charleston, S. C., and is a graduate of the Charleston High School and Virginia Polytechnic Institute. He began railway work with the Northern Central at Baltimore, Md., on November 14, 1898. On March 5, 1900, he entered the service of the Pennsylvania Railroad, on special duty at Williamsport, Pa., and in November of the following year he was transferred to Baltimore on special duty and subsequently served there as a machinist until July, 1902, when he again returned to be assigned to special work. In November, 1902, he became a draftsman there, and on October 19, 1903, was made an inspector at Altoona. He entered the test department in September, 1912, as foreman of the physical laboratory, and from June 1, 1917, until he received his recent appointment, he has been acting engineer of tests.

Chas. Manley has been appointed superintendent of machinery of the Missouri & North Arkansas, with jurisdiction over all mechanical and car departments with office at Harrison, Ark., and the position of superintendent, formerly held by him, has been abolished. H. J. Armstrong, resident engineer, has been appointed engineer maintenance of way, with jurisdiction over maintenance of way, structures and water service, with office at Harrison.



C. M. Starke



F. M. Waring

O. C. Wright, assistant engineer of motive power of the Pennsylvania Lines West, at Pittsburgh, Pa., has been appointed master mechanic on the Southwest system at Logansport, Ind. E. B. De Vilbiss, assistant engineer of motive power at Toledo, Ohio, has been transferred to the general office at Pittsburgh, Pa., taking Mr. Wright's place.

Edward Lawless, general foreman locomotive department of the Illinois Central at Freeport, Ill., has been promoted to master mechanic with the same headquarters, succeeding V. U. Powell, transferred to the Burnside shops, Chicago. E. C. Roddie, district foreman at New Orleans, La., has been promoted to master mechanic at McComb, Miss., to succeed C. M. Starke, resigned to become assistant superintendent of motive power of the Missouri, Kansas & Texas at Parsons, Kan.

John M. Henry, assistant superintendent of the New York division of the Pennsylvania Railroad at Jersey City, N. J., has been appointed assistant general superintendent of motive power of the lines east of Pittsburgh with headquarters at Altoona, Pa. He was born on October 10, 1873, and was educated in the public schools of Altoona and graduated from Purdue University in June, 1900. He entered the service of the Pennsylvania Railroad as a special apprentice in the Altoona machine shops on May 5, 1889. He served as an apprentice until September 1, 1896, when he entered Purdue University, being furloughed from the shops during the school term each year. In June, 1900, he became a special apprentice in the office



J. M. Henry

of the assistant engineer of motive power at Altoona; on July 1, 1901, he was promoted to motive power inspector at Altoona, and in February, 1902, was made assistant engineer of motive power of the Erie division and Northern Central Railway at Williamsport, Pa. He was promoted to master mechanic of the Elmira, N. Y., shops on July 1, 1903, and later served in the same capacity first at the Sunbury shops and then at the Olean shops, and at the West Philadelphia shops. On December 1, 1913, he was promoted to superintendent of motive power of the Western Pennsylvania division, at Pittsburgh, Pa., and on May 1, 1916, was appointed assistant superintendent of the Pittsburgh division. He was transferred as assistant superintendent to the New York division on April 15, 1917, and now becomes assistant general superintendent of motive power at Altoona, as above noted.

Purchasing

Robert E. Scott, assistant roadmaster of the Oregon Electric, has been appointed purchasing agent of the Spokane, Portland & Seattle, with headquarters at Portland, Ore.

Railway Officers in Military Service

J. C. Murray, general freight and passenger agent of the Missouri & North Arkansas, with headquarters at Harrison, Ark., has been granted a leave of absence to enter an officers' training camp.

OBITUARY

John H. Hale, for several years past a member of the Connecticut Public Utilities Commission, died at his home in Glastonbury, Conn., on October 12, at the age of 64. Mr. Hale was a noted horticulturist and grower of peaches.

Charles Harrison Tweed, formerly general counsel for the Central Pacific and the Chesapeake & Ohio, also general counsel of the Southern Pacific when that company was organized, died at his home in New York, on October 11, at the age of 83.

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Volume 63

October 26, 1917

No. 17

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The road foreman of engines has been designated as "the eyes of the mechanical department," inasmuch as he is called upon to keep the mechanical department informed regarding the performance of power and to report defective locomotives so that they may be repaired promptly. This is one of the important

duties of this officer, but in too many cases the mechanical department fails to use its "eyes" and disregards the recommendations of the road foremen. The importance of well maintained power at the present time is so obvious that no argument is necessary. It means that more tonnage can be hauled, that less fuel will be used and that the railways will be serving the country with greater efficiency. There is nothing more discouraging to any one than to see his best efforts wasted or disregarded. The road foremen should be made to feel that their efforts are appreciated and that they are performing an important function in our transportation system, not by kind words and pretty compliments, but by action—by putting into effect their suggestions.

Railroads have always hesitated to store coal on account of the supposed deterioration in the calorific value. The

actual extent of this has been definitely settled by a report on the deterioration in the heating value of coal during storage, published as bulletin No. 136 of the Bureau of Mines. Except for the sub-bituminous Wyoming coal, no loss in the heating value of the fuel tested was greater than 1.2 per cent in the first year or 2.1 per cent in two years. Under-water storage tests made with New River and Pittsburgh coals showed practically no loss in calorific value. The New River coal when stored in the air under severe conditions showed a heat loss of about one per cent in one year, two per cent in two years, reaching two and a half to three per cent in five years. The open air storage of Pittsburgh coal developed practically no deterioration during the first year. This increased slowly until at the end of five years the deterioration was 1.1 per cent. The Wyoming sub-bituminous coal, which is known as black lignite, deteriorates rapidly in storage, particularly by slacking. However, by the use of bins with air tight

bottoms and sides and a protecting layer of fine slag on top of the coal, the heat loss of this coal in storage can probably be kept below three per cent in one year and the physical deterioration can also be largely prevented. The results of these investigations, which were made by experts, Horace C. Porter and F. K. Ovit, show that the loss in calorific value of fuel in storage has been overestimated. The loss in most coals, such as New River and Pittsburgh, is so slight that the expense of underwater storage equipment would not be justified except to prevent fires from spontaneous combustion.

The establishment of "sailing days" for the despatch of merchandise cars from large freight stations, reducing by 50 per cent or more the number of cars needed for some services, bids fair to be an effective means of permanent economy; and, as a rule, shippers seem to be disposed to co-operate with the railroads to make the scheme a quick success; but, as with almost everything connected with freight transportation, there are innumerable details to be attended to. At Philadelphia some revisions of schedules have been found necessary already; and at New York the date for starting the plan has been further postponed because of the necessity of additional conferences to adjust it to the needs of the many thousands of shippers. In Massachusetts and Rhode Island it was to have gone into effect on the 10th of October but there the notice is suspended because of the shippers' fear that rival cities will be favored. And it may very well be that these fears are reasonable; although founded on a claim that is based on no real grievance. For example, a retail merchant midway between Boston and Providence or Worcester, will be told that he can have his freight shipped from the smaller city only on Tuesdays or Fridays, whereas at Boston there is no such restriction. The shipper at Boston can get a receipt on Wednesday as well as on Friday. But in the congestion which has prevailed during the past six months the actual date of arrival of two such shipments was, very likely, the same from both cities. The bill of lading issued at Boston seemed to be a promise to get the goods to destination two days earlier than the shipment from Providence

Sailing Days for Freight Cars

(or Worcester) but in reality it did not always carry out such promise. However, the retailer's confidence in a promise like this, whether well-founded or ill-founded, is sufficient to lead him to complain of neglect at the rival city; and the wholesaler who ships from there must, in self-defense, demand that cars shall be sent out no oftener from Boston than from his town. An agreement acceptable to all can without doubt be arranged if everybody has the requisite patience. In the case of many routes, where freight has to be transferred en route from one car to another, shippers will find a very direct self interest, not only in accepting, but in urging a scheme in which the sailing days shall be full car loads always. Meantime, the vitally important fact for all to bear in mind is that the wasteful use of cars must be stopped; for unless the greatest practicable use is made of each car, there would not be enough cars to fill the demand on "sailing days" regardless of how the "sailing days" are arranged.

THE IRRESPONSIBLE AGITATION ABOUT RAILWAYS

IT is remarkable how much attention can be attracted sometimes by utterances on important questions made by men who don't know a thing about the questions discussed. Recently a statement was issued in Washington and published in newspapers throughout the country, in which the prediction was made that the exigencies of war may force government ownership of railways in the "surprisingly near future." This prediction was attributed to an anonymous "Conference Committee on National Preparedness." The pretentious name used was adapted to convey the impression, and evidently did convey it to many people, that the "committee" spoke with knowledge, if not, indeed, with some kind of official authority. It added that "the whole transportation system of America is bending and may break under the strain of our first year in war"; and it advanced a lot of half baked suggestions concerning methods which it thought the railroads ought to adopt in order to increase their efficiency.

The *Railway Age Gazette* has tried to find out the personnel of the "Conference Committee on National Preparedness." We learn that its chairman is Henry A. Wise Wood, a manufacturer of printing machinery in New York. Of course, a manufacturer of printing machinery is just the man to know all about the railway situation and to go down to Washington and enlighten the public about it. The secretary is J. E. Clark. We never heard of him before, and therefore, cannot say whether or not he is as well qualified as Mr. Henry A. Wise Wood to discuss the railway situation. The treasurer is R. B. Price, who, apparently is, or formerly was connected with a large rubber company. Experience in the rubber business, it is needless to say, is the one thing which a man needs to give him intimate and thorough knowledge of railway matters.

One of the best answers which can be made to the apprehensions expressed by this self-ordained and self-constituted committee of amateur saviours of the country was contained in the remarks of Chairman Hall of the Interstate Commerce Commission before the National Association of Railway and Public Utility Commissioners in Washington last week. Mr. Hall said: The power to commandeer the carriers by rail has not been exercised. So harmoniously have all who have to do with the problem of transportation by rail put their labors together that the President has not seen the need of exercising that great power that was placed in him." He also said that the Interstate Commerce Commission has not found it necessary to exercise the power over car service given it by the Esch bill because "the railroads were prompt to recognize the demands upon them. They did the unprecedented. . . . If the

carriers had been standing upon their rights, if they had been calling upon this commission under its powers conferred by the Esch bill to put out orders with regard to the movement of cars; if there had been a reluctant compliance with the orders of authority, there never would have been produced such a result as has been produced by the cheerful, hearty and willing acting together of the shippers and carriers of the country." In other words, Chairman Hall expressed the belief that the voluntary efforts of the railway managers and the shippers to increase the efficiency of railway operation are producing better results than could be produced by the exercise of governmental authority. Chairman Hall and the "Committee on National Preparedness" differ so much because Chairman Hall knows what he is talking about and the committee does not.

IMPORTANCE OF THE MARCH CONVENTION AND EXHIBIT

THE successful convention of the American Railway Bridge and Building Association in Chicago last week, following that of the Roadmasters' Association a month ago, gives further emphasis to the advisability of proceeding with the American Railway Engineering Association convention next March, as pointed out editorially in these columns four weeks ago. Not only did the registration of members at the Bridge and Building convention equal the highest record in the history of the Association, but the attendance at the various sessions was the largest ever recorded, while the discussions were spirited and intensely practical in character.

A large part of the success of these meetings resulted from the revision of the program to meet present problems, many of which have arisen during the last six months. Without this revision there is no question but that the interest would have been less and the attendance smaller. Although some of the committees had done a considerable amount of work on subjects which were superseded by more timely topics, there has been no criticism of this action on the part of the committees or others.

It is important that the American Railway Engineering Association take similar steps. The success of the next convention will depend in large measure on the extent to which the Board of Direction meets the present situation by arranging a program which will provide for a full discussion of the engineering and maintenance problems which are presented by conditions due to the war. Although no definite statement has yet been issued regarding the convention, it is assumed that it will be held as usual. Past conventions have been held on the theory that they contribute to railway efficiency. But never was efficiency in all branches of railway service so vitally needed as it is now. Therefore, either the reason assigned for holding the convention before was a mere subterfuge, or there is the strongest reason that ever existed for holding it next March.

The same reasoning applies to the exhibits of the National Railway Appliances' Association. The manufacturers participating in these exhibits have spent large amounts of time and of money in their preparation in previous years and railway men have visited the Coliseum in large numbers. Was there ever a time when railway men so much needed information regarding devices that would increase efficiency in every direction, and especially that would save labor, as is the case now? Manifestly, to refrain from holding the exhibit this year would be to say, in effect, that such exhibits are of no value, and that the time and money which have been spent on them in the past have been wasted.

While from the standpoint of the individual members of the Appliances Association, the exhibit is a business proposition, and is a step in the selling of their materials to the railways, it is, as a whole, of great educational value to railway men. If the National Railway Appliances Association

was ever justified in emphasizing the educational value of its exhibit and urging the railways to send their men to visit it, this is the time of all times when it is justified in doing so.

All classes of manufacturers of railway supplies used in the maintenance of way department should unite in making this exhibit the most successful ever held. The exhibit should be made such as will give railway men the most practical information—information which will be of direct service to them in meeting the problems which are now immediately confronting them. Some companies which are now crowded with business, believe that it would be unwise to devote even a small part of the facilities of their plants to the preparation of devices especially for exhibit, and they feel, therefore, that they should not be represented. We agree with them that they should not transfer any of their forces from the manufacture of equipment urgently needed by the railways, but we also believe that a particularly interesting and practical exhibit can be made by the judicious selection of equipment on its way from the factory to the roads. Furthermore, the members of the National Railway Appliances Association owe it to the railway men who have supported the exhibit by their attendance in previous years, to give special prominence to all devices which will tend to save labor, as this is the liveliest problem now confronting railroad men.

Although some members of each association believe that the meeting should not be held this year, we believe that it is highly important that both associations proceed with their meetings as usual, revising their programs and their exhibits to meet present day conditions. The National Railway Appliances Association has already issued a statement to the effect that the exhibit will be held and its members should stand back of the organization unitedly to make it of the greatest possible value to the railways and thereby to themselves.

NOW COMES THE REAL TUG OF WAR

THE railways have now entered the period when they will have the greatest difficulty they have ever experienced in handling the available traffic. Within the last eighteen months, and more especially within the last six months, they have increased the efficiency with which they operate their facilities to an extent which two years ago would have been declared impossible. In July, the latest month for which complete statistics are available, they hauled 17½ per cent more ton-miles with each freight car and almost 10 per cent more ton-miles with each freight locomotive than they did in July, 1916. They handled not far from 50 per cent more traffic with each car and each locomotive than they did in the same month two years ago. This remarkable increase in efficiency has been maintained and even augmented up to the present time. But the unprecedented increase of traffic which began about two years ago continues unabated. The roads are handling at the present time not only a heavier passenger and freight traffic than they ever did in any previous year, but also a much heavier total traffic than they have at any previous time in 1917. Furthermore, the indications are that this growth of business will continue unabated for some months. The movement of traffic in the fall and winter months is normally heavier than at any other time of the year, and in spite of the enormous business which has been handled thus far in 1917, the present year promises to be no exception to the usual rule.

The effect of this steady and enormous growth of traffic at a time when, owing to numerous conditions, the railways are prevented from increasing their facilities, is shown by the fact that on October 1 the net car shortage suddenly increased to over 70,000 cars. This is less than half as large as it was last May. But within the next few weeks the

traffic undoubtedly will greatly further increase; and as general transportation conditions probably will grow more and more unfavorable, it is evident that the time has come when the Railroads' War Board, the managements of the individual railways, railway employees, the shipping and receiving public, and those having charge of shipments for the government must put forth an effort approaching the superhuman if the railways are to be enabled to handle all the traffic available. As a result of the severe and unrelenting service to which cars and locomotives have been put for over two years, they are not in satisfactory condition. The same thing may be said of track and other facilities. The railways have lost many employees who have voluntarily enlisted in the army, who have been taken for the citizen army, or who have found more profitable employment in other lines of work. In consequence, they have not now, and cannot get, as many competent employees as they had two years ago, or even a year ago. The weather up to the present time has been highly favorable to efficient operation, but in a short time the annual battle with snow, ice and cold will have to be fought; and then the difficulty of getting the greatest efficiency from equipment will reach the maximum.

One thing which is going to add greatly to the difficulties of the roads for some weeks is the fact that this year's crops, which are now moving, are unusually large. The effect of this is indicated by loud and general complaints of lack of sufficient box cars, which are coming in from all over the central and middle western states. The traffic situation is also going to be aggravated by the labor troubles in the coal mines which have been chronic in central territory for some weeks and which became acute recently in the Illinois field, where most of the mines were closed by a strike. There has never been a time since the middle of August when the railways in a large part of this territory have not been able to furnish more coal cars than there was a demand for. The recent strike in the mines in Illinois has greatly delayed the shipment of coal from the mines of that state. The result is going to be that during the next month or two the railways, and especially those of Illinois, will be called upon to handle a large amount of coal which they ought to have been given opportunity to move weeks ago. It is probable that when this delayed coal movement begins there will speedily develop a serious shortage of coal cars in place of the surplus which recently has existed. Let us hope that the public will take all such facts into consideration while the transportation situation is growing worse, as it probably will be for some weeks to come, and that it will be patient with the railways and give them the utmost co-operation while they are working out their great problem.

If we may judge by past experience, the developments of the next few weeks will pretty definitely determine how successful the railways are going to be in handling the country's traffic during the war. There seems good reason for believing that we are approaching the very peak of the war time freight movement, and that, while there may be no considerable decline of traffic for some months, there will not be a continuance beyond the present winter of such enormous increases in it as have occurred without a pause for many months. If the railways can handle the business until say, March 1, 1918, in a reasonably satisfactory way, the country may safely consider that its transportation problem during the war is solved, unless the struggle shall last so long as to cause the railways to go to pieces physically from the accumulation of deferred maintenance. In our opinion, the real tug of war in the transportation field is going to take place during the next three or four months; and we are confident that if the railways continue to receive the co-operation of the regulating authorities and the shipping public they will stand this crucial test of their efficiency in a way that will merit and will receive the commendation of the nation.

SOCIETY OF RAILWAY FINANCIAL OFFICERS

IN a way the Society of Railway Financial Officers has come to a mile post in its progress. Like most other associations of railroad officers, its primary object has been the adoption of standardized methods of work which will lead to more economical practices. One principal subject to which it has devoted its attention is the universal adoption of the short form voucher. It is hard for anyone not actually engaged in the work of the treasurer's office of a railroad to realize how great in the aggregate is the waste of labor involved in handling irregularly shaped, needlessly long and complicated vouchers which formerly required not only the payee's signature to the voucher, but also a receipt. Through the efforts of the Society of Railway Financial Officers, the requirements for receipt have been almost entirely done away with and a great majority of the more important roads have adopted a short form voucher of standard size which requires a minimum of labor in preparation and in payment.

For some years the society, principally through the efforts of T. H. B. McKnight, treasurer of the Pennsylvania Lines West of Pittsburgh, has been preaching the gospel of the adoption of a clearing house for inter-railroad accounts. The general scope of this clearing house has already been described in the *Railway Age Gazette* and a concise, clear statement of the outlines of the plan and the aims to be accomplished were contained in an address made by Mr. McKnight before the American Association of Railway Accounting Officers published in the *Railway Age Gazette* of June 29, 1917. The plan has been blocked largely through the opposition of the accounting officers. It offers obvious economies and at this particular time ought to be and apparently is going to be given consideration by the railroad executives. In a short discussion which took place at the annual convention of the Society of Railway Financial Officers (a report of the meeting is contained elsewhere in this issue) certain points were made clear and certain points still left obscure.

As concisely as possible, the proposed clearing house would accomplish the following: At present a separate draft is drawn against each road with which any individual road has dealings for the amount due for per diem, car repairs, etc., and a separate check is sent by each road to every other road with which it has dealings in settlement of drafts drawn against it. In other words, not only does each road settle with each other road separately for each account, but it both draws a draft against each other road for amounts due it and makes out a check covering amounts which it owes. The clearing house would receive from each road a memorandum of the agreed on debits and credits against each other road, put these all together and draw a draft against or send a check to each road for its net debit or credit balance. Each treasurer's office, therefore, would each month pay a single draft drawn by the clearing house or receive a single check made by the clearing house, whereas now thousands of drafts are drawn and thousands of checks issued.

Some discussion was had as to the amount of saving that would be effected in the accounting department. If the clearing house plan is properly understood this is a question which is not open to difference of opinion. In so far as the preparation of bills due by other roads is concerned, the accounting and determination of the amount of these bills and the checking up and verification of other roads' bills against the home road, there would be no saving by the adoption of the clearing house plan. As it is now, however, the settlement of each debit and each credit against each road for each account is the subject of a separate ledger entry. Under the clearing house plan there would be a single entry only in the ledger, that dealing with the settlement to or by the clearing house. In other words, up to the point where an agreed on debit or credit for each item was reached,

no saving would be made. Beyond that point there would be a reduction in the number of ledger entries necessary, —varying from thousands to hundreds,—to a single ledger entry.

Committees of the Society of Railway Financial Officers are now bringing this clearing house plan to the attention of railroad executives and to the attention of the Railroads' War Board at Washington. It is so obviously a real economy that it deserves the consideration of railroad executives, and unless some argument against it can be adduced with sounder backing than anything that has heretofore been brought forth, the plan should and, we may hope, will be adopted by the larger roads, and if it is adopted another mile post will have been passed by the Society of Railway Financial Officers.

ECONOMY OF GOOD SHOP LIGHTING

AN effective way to speed up the production in any shop is to provide proper and adequate artificial illumination—a truth not generally recognized. The advantages of good illumination include reduction of accidents, greater accuracy, less eye strain, greater contentment of the workmen, more order and neatness in the shop and easier supervision of the men, all of which have a direct bearing on shop production.

Take the item of accidents alone. A study of industrial accident records obtained from The Workmen's Compensation and Accident Insurance Company's report indicates that for one year, out of 91,000 accidents 23.8 per cent were due directly or indirectly to improper illumination. Of this 23.8 per cent 10 per cent were due primarily to inadequate illumination, while in the remaining 13.8 per cent the lack of proper lighting facilities was a contributory cause. When it is remembered that an accident not only deprives the shop of the services of the workman but also increases the actual operating expense due to the damage claims, the advantage of reducing the liability of accidents is evident.

Studies made of the effect of good lighting on shop production show that good light will add an average of approximately one-half an hour a day per man to the output which represents a production increase of five per cent, brought about by an expenditure of only one-half of one per cent of the wages—a saving equal to ten times the expense. The subject is of such importance that the Department of the Interior recently issued a technical paper on the relation between illumination and efficiency. This paper points out that the most enthusiastic supporters of proper lighting in shops are those who have taken the step to insure it. The paper also points out that actual instances have been reported where production has been increased from 2 to 10 per cent as a result of improved lighting. It is considered good practice to have the cost of light equal one-half to one per cent of the total wage, which is not high when we consider that an average workman will earn his share of this amount in six minutes. On the other hand, it is evident that it would easily be possible for such a workman to lose six minutes of his time each day because of inadequate illumination.

Simply to install a good lighting installation, however, is only half of the job; it must be well maintained so that it will continue to give good service. The standard of cleanliness for lamp reflectors should depend on a balance between the cost of cleaning and the loss by not cleaning. It has been shown that the loss on a 1,000-watt gas-filled lamp with porcelain enameled reflector will be approximately \$34 if allowed to go without cleaning for a year. Figures available for an average shop show that it is possible to clean such reflectors for an average cost of \$1 a month or \$12 a year, which indicates a saving of approximately \$22 per year per fixture.

Letters to the Editor

A REPLY TO DIRECTOR PROUTY'S VALUATION MEMORANDUM

St. Louis, Mo.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

A careful study of the memorandum* of Director C. A. Prouty, of the Division of Valuation, Interstate Commerce Commission, indicates that the policy of the Division of Valuation, as set forth by Mr. Prouty, will result in returning to Congress valuations of not more than two thirds to three fourths of the fair value of the railroads of the United States. It is a fact that the law of valuation is still in a plastic state, but this is primarily due to the so-called different "points of view" taken by those interested in valuation matters up to date. The owners of railroads and other public utility properties on the one hand, have, in the light of their experience in the use that has actually been made of their money, attempted to secure fair recognition of all of the elements that have resulted in capital expenditures in bringing those properties to the condition in which they have been valued; while the representatives of the public having regulatory or investigational powers over such railroads and public utility properties, and without extended experience in the expenditures of money for their development, have contended for the lowest possible figures that the owners could be forced to accept, either through negotiation, through the result of precarious franchise conditions, or through court decisions. It is unfortunate that the representatives of our federal government appear disposed to take advantage of this so-called plastic condition of affairs, which is nothing more nor less than the expropriation of the confiscatory attitude, in attempting to crystallize the unfair demands of the regulatory bodies into definitely expressed principles, having behind them the weight and dignity of the federal representatives. The fact that "the decision of this commission will go far toward fixing the law in many instances" should imbue the Interstate Commerce Commission with the extent of the responsibility placed upon them in this matter.

The vice in the railroad and the entire public utility situation today is not the uncertainty as to what is fair, but the uncertainty as to the extent to which the owners of the railroads and other public utility properties can make the courts see the fairness of their contentions in the light of the destructive representations by regulatory bodies. "If the present system of providing service by private capital is to be continued, some way must be found" not only to assure the capital of the treatment which it will receive, but also to assure that capital that it will receive fair treatment, and that neither the capital nor a fair return thereon will be jeopardized by the confiscatory attitude of the regulatory bodies.

Director Prouty announces in his memorandum that in spite of the claims of the carriers, the Division of Valuation insists at the outset on confiscating that part of a railroad which was actually spent for clearing and grubbing. If it be shown, or be fair to assume, that clearing and grubbing were actually performed and money actually expended for such purposes, the omission of that item of expense appears to amount to clear confiscation.

The valuation of all of the railroads as they exist today on the assumption that any railroad could be reconstructed by one impulse, in the most economical manner, by present methods and under present conditions, would fall far short

of showing fairly the amounts of money that were necessarily expended. The railroads were actually constructed under all conditions, and in many instances it was not possible to proceed by one impulse. In many cases on account of financial conditions, several such impulses were necessary to bring such projects to completion, and the actual amount of money spent under such conditions would far exceed the amount necessary for the construction in the most economical manner, under present methods and under present conditions.

It is certain that the government parties should not be required to report, as though it were a fact, what merely comes to them as hearsay from some other sources, but the Division of Valuation should give fair recognition to the fact that many items of expense were incurred which cannot today be established as facts, as it is certain that a full inventory of hidden quantities, especially on the older lines, which constitute the bulk of the mileage of the country, is not possible; it is certain that expenses were incurred in performing construction of which no physical evidence appears today, and it would be only fair to make some allowance for such expenses, which does not seem to be proposed.

In referring to depreciation Mr. Prouty's memorandum states, "it is conceded by the government that a public utility has a right to demand from the public in the way of earnings an amount sufficient to cover depreciation. Will it be conceded by the public utilities of this country that nothing need be allowed for the wear of the rails or the ties? Certainly it will not be and ought not be."

"It is true that in the case of a composite property, like a railroad, made up of different units of various kinds with a life of varying lengths, there comes a time when renewals will offset depreciation, so that if the property is properly maintained it does not depreciate as a whole below that point."

Of course, it goes without saying that there is depreciation in a railroad, and it is also true that the property finally reaches a point where, if properly maintained, the depreciated value does not further decrease. What, then, if the difference between the first new value and the so-called depreciated value? The owner does not invest his money to the amount of the depreciated value, but he does actually invest to the amount of the total cost. If it be contended by the Division of Valuation that carriers should be permitted to earn only on the depreciated value, then they should also be permitted to earn enough money to retire securities to the amount of the depreciation.

A study of railroad investments and railroad net earnings during the history of railroads in the United States will convince any fair minded qualified individual that the railroads have not in the past earned a fair return, and by no stretch of the imagination can it be assumed that the railroads as a whole have earned enough money to retire capital in an amount equal to the difference between the new cost and the depreciated value. If the commission desires to set up a new basis today for the control of future rates and earnings, then the reproduction cost now should be the basis of present rates, and the rates should be sufficient to earn above that return enough money for a capital retirement fund to retire the amount which the commission might claim as depreciation of the property as a whole, within such a period of years as the commission might determine.

No such basis has ever been followed in the past for amortizing that portion of the capital value representing original investment which is claimed as depreciation. The depreciation funds, so-called, have been deferred maintenance funds, and the accruals of those funds have been used not for the purpose of retiring capital value, but merely for the purpose of making renewals in such a way as to average the maintenance and renewal charges over a period of years. If such depreciation funds are set up and continue to be used, and if there is no additional fund for the retirement of capital

* Abstracted in the *Railway Age Gazette* of October 5, page 599.

value, then certainly the owners are entitled to a fair return on the original investment, because, notwithstanding the fact that there may be actual depreciation in the physical property, the actual investment in the service is equal to the entire original investment. If the depreciation funds be properly kept up, there will always be invested for the public and in their interest the depreciated value of the property plus an aggregate amount in the depreciation funds, the sum of which on any correct basis must always equal the original investment. As the depreciated property and the depreciation funds, which together equal the original investment, are in the service of the public, the public should pay a return on that amount and not on a depreciated value. Depreciation funds have not in the past been built up on any such basis, and if the sum of the depreciated value of a property and its depreciation funds are less than the original investment, it is due to the fact that on the one hand there has been no proper method of making the users of the property pay for the depreciation in its value, while in their service; and on the other hand the net earnings of the company have never been sufficient to afford a fair return on the investment, and the users are in default to the owners in the amount of the difference. A fair recognition of the inadequacy of the rates in the past and the inadequate returns that have been earned, will entitle to recognition at this time, the cost of reproduction new and a fair return upon that cost.

If the Commission desires for future regulation of railroads that the depreciated value be used as a basis on which the fair return should be figured, then the general relation of depreciated value to original cost should be determined, and the rates should be so adjusted as to make the net earnings sufficient to retire the difference within such period of years as might be indicated, either by the retirement of an average amount each year on a straight line basis, or by the retirement of a fixed amount at the end of a fixed period of years on the sinking fund basis. It is unfair at this time to seriously contend that there is in the service of the public the depreciated value of the properties, as the original investment, is really in the service of the public and if in fact the properties have depreciated, the users of that property have been the gainers in the amount of the depreciation for which they have not yet reimbursed the owners. The value in the service of the public is the original investment, or when that can not be ascertained, the reproduction cost new.

If the depreciated value be made the basis of rate making at this time without passing through a transition period during which the carriers will receive the amount claimed as depreciation, in addition to a reasonable return, then certainly the difference between the original investment or reproduction cost new, and the so-called depreciated value, is the amount that will be clearly confiscated from the owners.

Mr. Prouty states that no allowance has been made for contingencies as such by the commission in the tentative value of the Texas Midland, and endeavors to justify that error of the commission by the claim that no expenditures have been made except such as were discovered by the all-seeing eyes of the government parties. In another part of his memorandum he states that no allowances were made for hidden quantities except such as could be noted as actually existent. It is a fact, however, that no matter how clear or complete the histories of railroads may be, many expenditures were made in the construction of the roads of which record can not be found, and of which there is no physical indication today.

An inventory of a railroad based on the most economical method under present conditions and under present practices makes no allowance whatever for conditions that increased the cost of every item of physical property. The construction of many lines has been seriously delayed by unusual weather conditions and unprecedented floods. Bridges have been washed away during construction, embankments have

disappeared into sink-holes and swamps. Organizations have been maintained through long periods, protecting the incomplete property during floods and other conditions preventing progress. Large sums have been spent on bridge foundations in excess of the requirements of the plans on record, and the plans have frequently not been corrected to show the increased cost of such construction.

Certainly it is not fair to say that because a railroad could not possibly establish by complete detail records or by physical conditions on the ground, many years after construction, the exact fact of such increased expenditures, no allowance should be made for them. It is to cover such expenses as those outlined above that an allowance for contingencies has always been made in valuations, and it is unthinkable that the commission will adopt the policy of the division, as set forth by Mr. Prouty, that no contingencies whatever should be allowed for, as it is just as necessary to allow them in arriving at a fair valuation, as it is to allow for them in a preliminary estimate. Omission of any item for contingencies amounts to a clear confiscation of a very considerable portion of the investment.

The statement that no engineering should be allowed on land, and that whatever there may be is more properly chargeable to the land, would be fair enough if the cost of the engineering had really been added to the cost of the land, but only the fair market value of the land was allowed. Certainly the engineering in connection with the acquirement of railroad property amounts to a very material sum, and some allowance should properly be made for that item.

The contention that the value of railroad land is equal to its area multiplied by the unit value of similar or adjacent lands is so far wrong that it is difficult to see how the Commission could have been misled into making any such unfair assumption. Mr. Prouty states, "Nothing is included for acquisition, nor for severance damages, nor for interest during construction." Certainly land can not be acquired without attendant expenses. Right-of-way agents and their staffs, abstractors, land surveyors, local attorneys, condemnation proceedings, all cost money, and are represented in the physical property. It is absurd to omit allowances for them and to assume that the expenses were never incurred.

While it may be the opinion of the commission that severance damages are not real damages, yet it is a fact that the railroads have paid out millions of dollars for such damages, and the omission of such a large item of expense, which is so clearly represented in the capital invested in the railroads, is so unfair as to require no comment.

Nothing whatever is said about the necessity of railroads paying higher prices for lands even where no severance is made, in order to secure particular locations for passenger stations, freight stations, or terminal yards, nor for the higher prices than market value of surrounding lands that must be paid to get continuous strips for right-of-way use. The railroad value of the lands far exceeds the market value of the surrounding properties, and this fact would seem to be so apparent that the attitude of the commission appears to be deliberately unfair. There may be some doubt as to the factor by which the market value of the adjoining land should be multiplied in any particular instance to get the railroad value, but that difficulty is not sufficient justification for ignoring that large item of expense, and it would be a comparatively easy matter for the commission to determine in any particular case just what that factor should be.

Unless the Commission, by adopting a broad policy of public welfare, follows radically different lines than those laid down by Mr. Prouty, the future of transportation facilities in the United States is not encouraging, as the policy laid down in Mr. Prouty's memorandum would be so restrictive of development as to very largely stop railroad construction and extension.

C. E. SMITH.
Consulting Engineer.

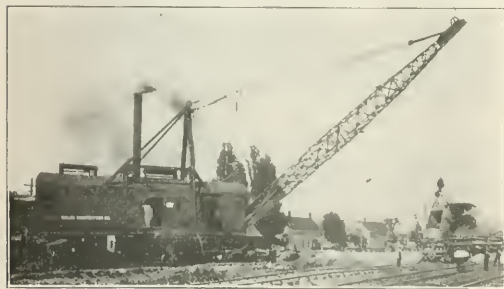


An early stage in the grading.

Pennsylvania Builds Hump Yard at Indianapolis

**Modern Classification and Engine Terminal Facilities
Are Being Provided. Extensive Drainage System Installed**

TO keep abreast with the rapid industrial development of Indianapolis and its increasing importance as a railway center, the railroads entering that city are spending large sums of money in expanding their facilities for the handling of the freight and passenger traffic which passes through or originates at that point. The Pennsylvania Lines alone now have extensive improvements under way in this city for yards, freight houses and track elevation work.



Excavating a Subway with a Drag Line

One of the most important of the several projects is the so-called Hawthorne yards, a new freight terminal yard, which is now in the course of construction on the eastern edge of the city.

INDIANAPOLIS AS AN INTERCHANGE POINT

The lines of six railways enter the city of Indianapolis, the Big Four with six divisions, the Pennsylvania Lines with five divisions, the Cincinnati, Indianapolis & Western with two divisions and the Monon, the Illinois Central and the Lake Erie & Western with one division each. A seventh road, the Indianapolis Union Railway, which operates the Union station, the Union tracks and the Indianapolis Belt Railway, provides the means for the interchange of traffic between the several roads.

The freight interchange is handled over the Belt railway

tracks. This line is 14 miles long and is located almost entirely within the city. It extends around the city from a connection with the tracks of the Monon and the Lake Erie & Western, near Twenty-first street and Martindale avenue, connecting with the several other railways and their various divisions and has its second terminal at the connection with the Canal branch of the Big Four in North Indianapolis.

The convergence of these six roads with their 16 divisions in Indianapolis creates a great amount of interchange business requiring extensive yards. In the early days the yards were built largely inside the Belt railway and now, with the enormous increase in the traffic handled and because of the growth of the city, it is difficult to find room for expansion at the old sites even if such an arrangement were considered desirable.

The facilities of the Indianapolis division of the Pennsyl-



Some of the Excavation for the Yard

vania lines for handling freight prior to this improvement consisted of a yard east of State avenue inside the belt line and any plans for its expansion involved a large expenditure and would not have provided adequate facilities for any reasonable length of time. It was, therefore, decided to build the new facilities on land acquired for the purpose east of the Belt railway and north of Prospect street, which

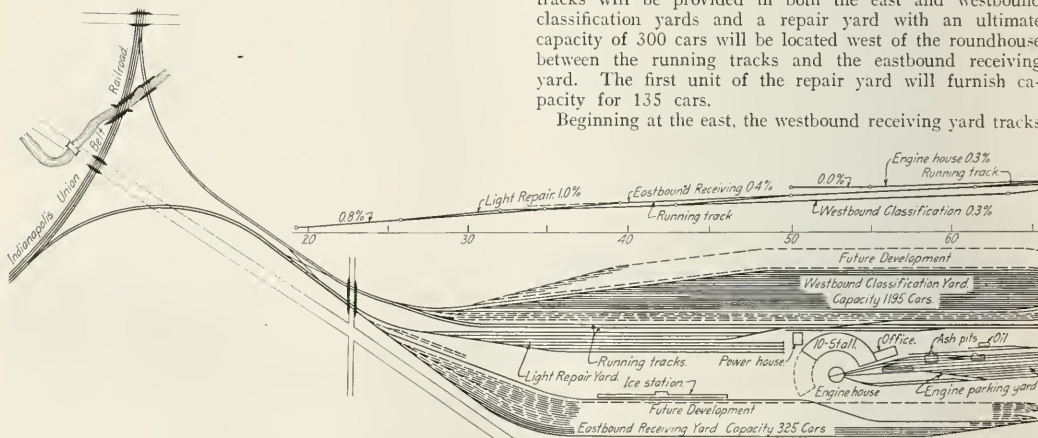
carries the traffic of the Indianapolis & Cincinnati traction line. The property is approximately two miles long and one-quarter of a mile wide and extends from Sherman Drive on the west to Arlington Road on the east. The yard is connected with the Belt railway on the west by means of double wye tracks and with the main line of the Indianapolis division on the east by a double track railroad $2\frac{1}{4}$ miles long, built from a point two miles east of Irvington on the main line to the east end of the new yard. All Indianapolis division freight trains will be handled over this connecting line, putting an end to the operation of freight trains through Irvington and the territory between Irvington and the yard at State street. This connecting line is built on a right-of-way 150 ft. wide, acquired for the purpose.

In developing the plans for the improvement consideration was given to the probable future needs of Indianapolis with the intention of building now only for the present and the immediate future, and adding to the layout when it was found necessary. In carrying out this idea sufficient property was acquired and the yard was designed for an ultimate capacity of 10,000 cars. The present improvements include the construction of 50 miles of yard tracks, a reinforced concrete engine house, a reinforced concrete coaling station, inspection pits, ash pits, car repair facilities and an icing station for icing refrigerator cars in transit.

The first yard unit to be constructed will have a capacity of 3,500 cars and will include eastbound and westbound receiving yards and east and westbound classification yards with repair and caboose tracks in each yard. Ten stalls of the engine house will be built as a part of the first unit, and the plans provide for its extension to a 30-stall house when necessary.

ARRANGEMENT OF THE YARD

The yard was designed and built as a gravity yard, two double track humps being provided with a scale on each.

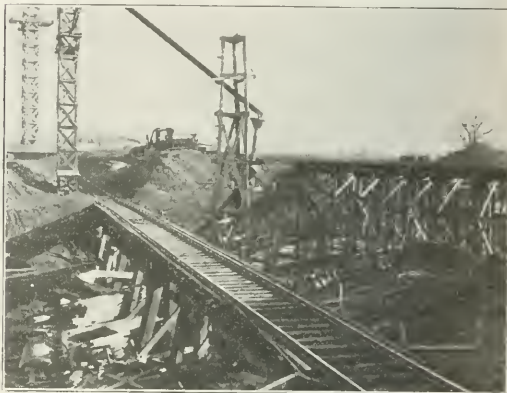


West Half of the Yard

The running tracks divide the east and westbound yards into units. These tracks are laid 20 ft. between centers. In the yards the standard spacing is 13 ft. except for the ladder tracks which are laid 18 ft. between centers. The westbound receiving yard will ultimately have 33 tracks, with a total capacity of 2,470 cars. The first unit will have three tracks with capacities ranging from 90 to 100 cars, three tracks holding from 80 to 90 cars, one track with a capacity for 75 cars and another for 80 cars, or a total capacity for the first unit of 695 cars. The arrangement of

the tracks for the first unit in this and the other divisions of the yard in reference to the ultimate development may be seen in the layout map. The westbound classification yard will eventually be supplied with 33 tracks with a total capacity of 2,130 cars. Of these, the first unit will consist of a total of 20 tracks having a capacity of 1,195 cars.

The eastbound receiving yard will ultimately have 17 tracks with a total capacity of 1,250 cars, and the eastbound



One of the Subways Under Construction

classification yard 41 tracks with a capacity of 2,895 cars. The first unit in the receiving yard will consist of 5 tracks with a capacity of 325 cars and in the classification yard of 17 tracks having a capacity of 1,135 cars. The engine parking yard will have a capacity for 20 engines. Repair tracks will be provided in both the east and westbound classification yards and a repair yard with an ultimate capacity of 300 cars will be located west of the roundhouse between the running tracks and the eastbound receiving yard. The first unit of the repair yard will furnish capacity for 135 cars.

Beginning at the east, the westbound receiving yard tracks

were built on a 0.22 per cent grade, descending in the direction of traffic for 2,000 ft., then on a level grade for 2,678 ft. to the approach to the hump. The hump approach is 654 ft. in length and is on a 0.9 per cent ascending grade. The descent from the hump to the eastbound classification yard is over a 3 per cent grade for 150 ft., then on a 1 per cent grade for 1,168 ft., the remainder of the yard being on a 0.3 per cent descending grade in the direction of traffic.

In the eastbound yards, commencing at the west end, the receiving yard is on a 0.4 per cent ascending grade for its

entire length. The approach to the hump, which is about 800 ft. in length, is on a 1.6 per cent grade to the summit. The descent from the hump is on a 2.5 per cent grade for 175 ft., then on a 0.9 per cent grade for 750 ft. From the end of the 0.9 per cent grade the yard tracks are placed on a 0.3 per cent descending grade in the direction of traffic for 1,100 ft., then becoming level for 1,400 ft., before rising to the level of the running track over a grade of 0.5 per cent, 2,000 ft. in length.

AUXILIARY FACILITIES

The terminal facilities for the yard will include a 30-stall engine house of brick and concrete construction. A con-



One Line of the Drainage System

tract for the erection of 10 stalls in this house has been let to the Alliance Construction Company of Indianapolis. The turntable will be 100 ft. in diameter, and the house 112 ft. deep with a distance of 262 ft. from the center of the turntable to the outer circle wall of the house. A 60-ft. by 144-ft. annex to the roundhouse will be used as a shop room as well as an office building for the road and roundhouse em-

ployees. A power house 35 ft. by 81 ft. will also be built in connection with the roundhouse.

A contract has been let to the Roberts & Schaefer Company, Chicago, for the construction of a 500-ton reinforced concrete coaling station of the mechanical type. Three cinder pits, three concrete inspection pits and a water softening plant will also be provided. The cinder pit will be of concrete and steel construction. The cinders from the engines will be caught in a hopper under the track and conveyed to carts which in turn will be emptied into cars by an air-

driven hoist. The water station will consist of two 50,000-gal. tanks which will be connected with a water softening plant consisting of a water softener and sludge pond. The water will be secured from the city.

A contract will be let in the near future for the construction of a 30-ft. by 58-ft. yard office, the basement of which will be occupied by lockers and rest rooms for yard and road crews. Space will be provided here for an oil room and a boiler room. The first floor will provide quarters for the yard clerks, medical examiner, trainmen, crew despatcher and caller, and a supply room. The second floor will be used by the store clerk, assistant trainmaster, yardmaster and telegraph operators. A storeroom will also be provided on this floor.

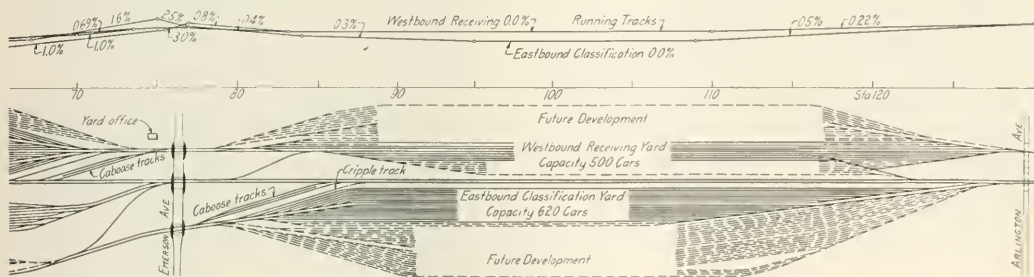
PRESENT STATUS OF THE WORK

The grading for the yard tracks and for the Indianapolis division connection line has been completed as has the extensive drainage system for the yard and the bridge masonry constructed in connection with the drainage system and the elimination of crossings at grade with the tracks. In the grade separation work Sherman Drive, South Eastern avenue and Emerson avenue were carried under the yard in subways and Arlington avenue over the yard by means of a reinforced concrete viaduct. A bridge with a trough floor and concrete abutments is provided over the Indianapolis division connection to carry the tracks of the Cincinnati, Indianapolis & Western. A 50-ft. semi-circular arch carrying the tracks of the west wye connection to the Belt railway over Pleasant Run, a 6-ft. by 12-ft. concrete box which carries Bean creek under the yards and two bridges carrying Brookville road over Lick creek and the connection track complete the bridge work.

CONSTRUCTION

Work was begun on this project in May, 1916, when the railroad built a trestle along the line of the north wye connection to the Belt railway to provide an entrance track to the yard site. The trestle was necessary in crossing the low and marshy ground encountered in this locality. The contract for the grading, masonry, and drainage was let to the Dunn-McCarthy Company and the Clifford Construction Company, Chicago, who began operation in June, 1916.

The grading consisted of 750,000 cu. yd. of excavation,



East Half of the Yard

200,000 cu. yd. of which was wasted in filling the low ground just east of the Belt railway. Three methods were followed in making the excavation, the heaviest work being done with steam shovels, while in the lighter work both a dragline machine and Western excavators were used.

The heaviest work was just west of Arlington avenue in the westbound classification yard. The equipment for this work consisted of two shovels and six trains of standard gage dump cars, three trains to each shovel. The earth moved by the shovels was transported west to the low ground

in connection with the roundhouse.

near the Belt railway, and the first fills were made along the line of the double track wye tracks, utilizing the trestle mentioned above for dumping. The 200,000 cu. yd. of excess excavation which was wasted here was placed from construction tracks laid on the fills. The material moved by the dragline was also loaded into standard gage cars, one train being provided for the machine.

A large proportion of the earth was moved by Western excavators which were operated by horses and tractors, the material being loaded into dump wagons for transportation to the fills. An average of 25 teams were used with each of these machines operated by horse power.

THE BRIDGES

The most interesting of the bridges is the reinforced concrete viaduct 296 ft. long which carries Arlington avenue over the yard tracks. The construction of this viaduct involves 530 cu. yd. of foundation excavation, 800 cu. yd. of concrete and 79 tons of reinforcing steel. The viaduct consists of eight spans of 37 ft. and provides a clear roadway of 24 ft. 7 in. The substructure consists of bents built of two reinforced concrete columns resting on 6-ft. by 8-ft. footings. The columns support a reinforced concrete cross girder 4 ft. 4 in. in depth by 18 in. wide and 26 ft. in length. The bents are all single column except at the center where a double column bent was built to provide for contraction. The expansion joint which is placed at the center of the bridge was filled with felt and asphalt.

The main girders spanning between bents are 6 ft. 4 in. deep by 18 in. wide and have spans of 37 ft. They are connected with cross girders 15 in. wide by 2 ft. 4 in. deep, spaced 4 ft. 7 in. on centers. The main girders extend 4 ft. above the floor level, providing the bridge railings which are relieved by paneling. The floor was designed for a uniform live load of 125 lb. per sq. ft., or a 20-ton road roller. The wearing surface of the bridge is of concrete and beneath the

tion with this bridge it was necessary to raise the Cincinnati, Indianapolis & Western tracks and two bridges in the vicinity. The bridges were raised under traffic by jacks and were placed on blocking. When complete, the old stone abutments will be encased in concrete and will be provided with new bridge seats.

THE DRAINING SYSTEM

The drainage for the yard and subways is provided by a system of sewers consisting of one main sewer 6,300 ft. long running through the center of the yard and emptying into Pleasant Run and lateral sewers extending across the yard at intervals of 600 ft. The surface water is collected into 110 inlets placed along these lateral sewers. The main sewer was excavated with a dragline machine and was built

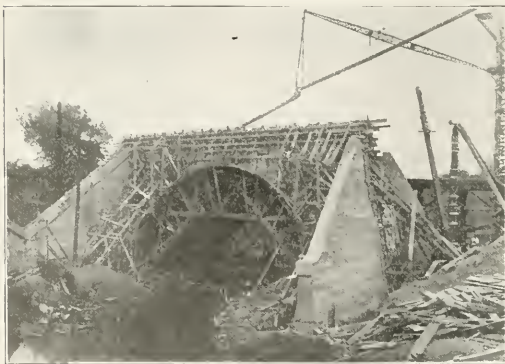


An Early Construction Trestle

of segmental blocks. The lateral sewers were built with trenching machines.

In the drainage system it was necessary to take care of Bean creek which meandered across the site of the yard. The old channel was filled, and the stream diverted to a new channel along the north side of the yard, and a square crossing of the yard was provided by means of a 6-ft. by 12-ft. box culvert. In order to drain the eastbound classification yard it was necessary to lower the creek to a point $1\frac{1}{2}$ miles below the yard. The excavation for the new creek channel was made by a dragline.

Plans for this terminal were developed by the engineering department of the Pennsylvania Lines West, Southwest System, under the directions of W. C. Cushing, chief engineer maintenance of way, and D. P. Beach, division engineer. J. H. Schilling is the engineer in direct charge of all construction.



One of the Concrete Arches Under Construction

pavement the floor is thoroughly waterproofed with Minwax, laid in 5 plys.

The bridge is founded on hard pan, no piling being necessary. The construction materials were unloaded from the cars at the ground level, and the concrete was placed in the forms by means of a tower and chute.

A 50-ft. concrete arch was provided over Pleasant Run and double reinforced concrete boxes for the subways. At Sherman Drive the subway consists of two 25-ft. boxes and at Emerson avenue of two 30-ft. boxes. Bean creek was carried under the yard in a 6-ft. by 12-ft. concrete box 600 ft. long and a bridge consisting of a trough floor superstructure carried on concrete abutments was provided at the Cincinnati, Indianapolis & Western crossing. In connec-

MILITARY CAMP RAILWAYS.—The recent accident on a military camp railway in Yorkshire is a reminder that such lines are among the most interesting railway developments of the war. A typical railway of the kind is on the standard gage, but unfenced and with the minimum of signals, while stations, platforms and sidings are also reduced to a minimum. They serve the dual purpose of improving communication within the limits of a large camp itself, besides enabling through passenger and freight trains to be run to and from the camp by means of a junction with the most conveniently-situated trunk line. Such railways, which must not be confused with the narrow gage camp lines, are also valuable for instructional purposes. They are entirely operated by soldiers, who do not, however, always wear khaki, but the familiar blue-suits and uniform caps, which are distinguished by regimental badges and military brass buttons. Some of these railways own a certain amount of merchandise stock, including high-capacity cars, but most of the stock has been supplied by railway companies. For instance, on a military railway "somewhere in the south of England" the regular service is maintained by Brighton Railway locomotives and coaches, locomotives constructed at Swindon, and Southwestern passenger cars.—*Railway Gazette, London.*

Society of Railway Financial Officers

Interesting Papers Were Read on Thrift Encouragement and on Handling the Liberty Loan Subscriptions

THE eleventh annual meeting of the Society of Railway Financial Officers was held on Tuesday, Wednesday and Thursday of last week. Part of the sessions were held at the Missouri Athletic Association club house and the others at the Jefferson Hotel at St. Louis. After the roll call there was a brief address of welcome made by A. O. Wilson, followed by a short address by President E. H. Alden.

At the afternoon session Frank Trumbull, chairman of the Railroad Executives Advisory Committee, gave an address which the society voted to immediately print and distribute among its members and among banking institutions. The membership committee's report was then made and accepted, and the membership committee was requested to learn the names of the members who had joined the service of the United States and to print these names as a roll of honor in the minutes of the meeting.

CLEARING HOUSE REPORT

T. H. B. McKnight, treasurer of the Pennsylvania Lines West and chairman of the Committee on Clearing House Reports, reported that his committee had turned over to the executive committee the work of interesting railroad executives in the clearing house plan. Some discussion followed, and Mr. McKnight outlined briefly what the clearing house plan was and what progress had been made toward its adoption. The work had been largely educational; the treasurers of nearly all of the larger roads had been convinced of the desirability and feasibility of establishing a clearing house, but the difficulty lay with convincing the accounting officers and up to the present the accounting officers had refused to approve of the plan.

THRIFT ENCOURAGEMENT

At the Wednesday morning session L. E. Katzenbach, treasurer of the Great Northern and chairman of the Committee on Thrift Encouragement, presented the following paper:

Only by the exercise of thrift can the United States successfully accomplish its part in the present struggle. The officers of transportation companies need no report nor recommendation from this committee to support and co-operate with our government officials in all branches of thrift, (a word having the same meaning, but, perhaps, a healthier sound than the word efficiency).

As long as the necessity exists, the transportation companies will help their employees to purchase government issues of bonds, and will offer facilities for easy payment. The issues of Liberty Loan bonds and War Savings certificates have done and will do much to start habits of thrift, and, no doubt, today there is a Liberty Bond in many a home that never before had a dollar laid by.

It has been stated that railroad employees represent about 10 per cent of the wage earning population of this country, and a class of such large relative size has its influence upon the life of the country in times of peace as well as war. The committee hopes that the thrift habits formed now in times of war may be continued indefinitely by co-operation between transportation companies and their employees, and offers its report as a recommendation for preparedness to meet the problems, not only of today but of the future.

Since our last meeting the subject of thrift has been studied in many different ways, and the time for this society to agitate the subject among its employees seems to be most opportune.

In order to ascertain what our transportation companies are doing to encourage their employees to save, your committee on December 28, 1916, sent out a circular letter of inquiry to all members of this society and to financial officers of companies not represented in the society. Replies were received from practically every company addressed.

Many companies maintain pension systems, and a few have hospital and relief organizations, but your committee has thought best to confine its report to plans that involve personal saving and setting aside of funds by employees.

Attached to, and forming a part of this report, summarized in order of their establishment, will be found rules and regulations of the savings and investment plans which have been reported to your committee, and where the information could be obtained, figures are given showing partial results of these plans in effect. The small number of plans in effect has been surprising to your committee, and readily suggests the question as to why there are not more. Do the savings banks and institutions offer all the facilities and benefits that a corporation can offer to its employees through a savings plan of its own? Is there anything to be gained by offering employees an opportunity for thrift and investment? Why do such a small percentage of employees avail themselves of the plans now in effect? These and similar questions present themselves after the study that your committee has given to this subject, and the answers may be approached from different angles, according to the purposes of the employer.

Recent economic development, resulting in increased division of labor and changing social conditions, has brought out the study of welfare work among employees, and all efforts in that direction, based on the proper relation of employee to employer, are designed to produce co-operation. Only by co-operation can all the units of organization reach combined efficiency.

Before attempting to answer the questions above presented it is necessary to determine the relation between thrift and co-operation. Figures are available to show the economic advantages of pleasant working surroundings, proper sanitary arrangements, etc., and the advantages have been the result of the improved physical and mental condition of employees. A proper mental condition implies freedom from anxiety and worry; a condition of mind hard to realize, in the best of surroundings and working conditions, if one's bank account be constantly threatened with an overdraft. Fair wages are necessary, it is true, but with the ability to save must also be the inclination. The function of the thrift plan is to develop the savings inclination and encourage it to become a habit. It does not require much imagination to picture the mental satisfaction of an employee who has a reserve fund, however small, that is increasing to provide for the "rainy day."

If you are willing to concede that a savings account laid by and invested helps to produce the mental attitude essential for co-operation, and that co-operation should be developed in every possible way, the savings plan or systematic encouragement of thrift among employees deserves consideration in railroad organizations.

Properly managed a department of savings or investment should be able to reach many employees that the savings institutions do not attract, and with great benefit to the employees by reason of the saving in administration expense. The railway companies may expect to profit by better loyalty and co-operation from their employees.

One reason for the small percentage of employees enjoying

the savings facilities offered may be the decreasing margin between wages and living expenses, and another may be the employee's unwillingness to have his employers know the extent of his savings, but your committee suggests, if the savings plans now in effect were advertised as carefully as the railway companies advertise their traffic, that the increase in the number of savings accounts would be quite noticeable.

We recommend to those transportation companies having at present no savings or investment plans for their employees that they each institute some such plan. We further recommend that savings plans include provisions along substantially the following lines:

1. That the plan or fund be under company management or control.
2. Company guarantee of principal of deposits, and interest at a rate fixed from time to time by the governing board.
3. Systematic deposits with a low minimum.
4. Privilege of making deposits through payroll deduction orders.
5. Loans in excess of deposits to needy employees (each case to be handled by application to the governing board).

Included in the report were outlines of the thrift plans of a number of railroads including the Pennsylvania Railroad Employees Saving Fund, the Baltimore & Ohio Relief Department, the Employees Saving Fund of the Pennsylvania Lines West of Pittsburgh, the Great Northern General Office Employees Association, the Soo Line Co-operative Association, the Chicago & Alton Employees Savings and Loan Association, and the Arizona & Eastern Savings Plan. Under the head of Investment and Profit Sharing Plans were considered the Great Northern Employees Investment Company, Ltd., and the Illinois Central method of selling stock to employees. The description of these plans is omitted because of space limitations, but will be published in later issues of the *Railway Age Gazette*.

The committee consisted of: L. E. Katzenbach, chairman; Byron Cassell, A. B. Jones, R. R. Reed, Frank Scott and E. H. Alden, ex-officio.

After a rising vote of thanks, the following resolution was adopted:

"Resolved, that a special committee of three, of whom the president shall be one, be appointed by the chair to confer with the Honorable Frank A. Vanderlip as to the possible service by this society and its members in assisting to place new war savings certificates, and that such committee be and hereby is empowered to co-operate with Mr. Vanderlip and the committee of railway executives as may seem to be for the best interests of the United States government, and report back to the executive committee its recommendations."

ARE THE RAILROADS GETTING THEIR DUES?

John G. Lonsdale, president of the National Bank of Commerce in St. Louis, then gave the following address:

To all those who give attention to the underlying causes of a nation's welfare, the trend of the railroad situation in this country for the past several years has been alarming; in fact, so *very alarming* that, were it my purpose merely to offer a categorical answer to the question, "Are the railroads getting their dues," I should voice an emphatic "no," and sit down with the knowledge that my opinion could not be successfully challenged. But, while I do not intend to delve very deeply into railroad history and statistics, still I wish to elaborate my "no" just a little.

Fifty million people in this country are owners of railroad securities, either directly or through investments in banks and insurance policies; but, strange as it may seem, these people are just being waked up to the fact of their ownership through the educational work of the National Association of Owners of Railroad Securities—an organization, by the way, that is deserving of the active support and co-operation of the management of all railroads. However,

there are other—and, to the careful student, more important—considerations that call for a broad public interest in railroad prosperity. Our nation, as it exists today, has been welded and held together no less by our railroads than by our Federal Constitution and form of government. So important to our business and industrial life is the existence and operation of this great railroad system that if all the property of which it is composed were to be suddenly destroyed, the real estate owners of the nation, in order to uphold the values of their lands, could well afford to donate the twenty billion dollars necessary for replacing every railroad. It seems unaccountable, therefore, that the Interstate Commerce Commission should actually place the life of this great industry in jeopardy by its refusal to grant an increase of rates commensurate with the increased costs of operation. It is hard to say what considerations dictated this refusal.

When the federal government in 1887 eliminated competition as the governing factor in the fixing of railroad rates, it devolved upon that government to allow rates that would give the industry a fair return upon the capital invested and reasonable compensation for the risks involved. The Interstate Commerce Commission is the particular branch of the government to which this duty has been delegated. While other industries are creating great contingency funds for the expected after-the-war period of depression and adjustment, our railroads are falling behind on current dividends and expenses. Gross profits have vastly increased, but expenses have increased faster.

As a result of these conditions, the flotation of railroad securities on a satisfactory basis is a virtual impossibility. Not only must bonds be issued at high rates of interest, but even then they must often be sold at a ruinous discount. And, at the present moment, on account of heavy governmental requirements for capital, the railroads are still further hampered, until it seems that the government may be forced to render assistance. This may be done by directly furnishing capital in the form of loans; or, the situation might be somewhat relieved by encouraging the rediscounting of railroad obligations by the federal reserve banks. On June 11, 1917, in reply to an inquiry as to the eligibility for rediscount of 90-day paper of a certain waterworks company, the Federal Reserve Board wrote as follows: "If the proceeds of the paper under consideration have been or are to be used to provide funds for pay rolls, purchases of coal, etc., and if the paper is otherwise in conformity with the law and the provisions of the board's regulations, it is eligible for rediscount by the federal reserve bank." This ruling would, no doubt, apply to railroad paper as well. The government prescribes the system by which all railroads shall keep their books, and these records should therefore be satisfactory as a means of determining whether any railroad's financial condition is such as to make its paper eligible.

Of course, I realize that providing for the free rediscounting of railroad paper would not offer a permanent and sound solution for your problems, because any large amount of outstanding short-time obligations is a menace to railroad success. Nevertheless the present moment calls for emergency measures, and something must be done quickly. A public statement from the reserve board signifying its willingness to accept such paper for rediscount would have the effect of strengthening railroad stocks and bonds in the estimation of the investing public, in addition to providing a considerable amount of otherwise unavailable capital.

This matter of declining railroad security markets and diminishing returns upon such securities has a very serious bearing upon the successful placing of United States government bonds. It is a well-known fact that bonds can be more easily and quickly sold to those accustomed to buying securities—that is, to the investing public. But this part of the public is not prospering now—ground is being lost every day. If the people at large were made to pay increased railroad

rates, the money would be taken in great measure from those who will not buy Liberty Bonds, or any other kind of bonds, and would be distributed in the form of dividends and interest among those who *will* buy. Furthermore, the return to public favor of railroad securities would have a buoyant effect upon the money market and business interests in general. The importance of propitious money market conditions in floating government securities is well recognized. Pessimists are not natural buyers—optimists are. And it is going to take an enormous amount of security-buying to satisfy the needs of our government during this war.

Regardless of how you approach the railroad problem of today, or what possible solution you revolve in your mind, you are always forced to this one conclusion: Relief must come from the federal government. There is no opposition to increased rates among our big shippers. The Interstate Commerce Commission is free to act. If the commission will grant a general increase, the railroads will finance themselves; if not, and if the present trend of affairs continues, the government must sooner or later furnish financial aid to prevent the collapse of this, our nation's greatest and most indispensable industry. If patriotic appeals must eventually be resorted to in order to provide railroad capital, I, for one, will feel as fully bound to respond as I do to Liberty Bond appeals.

HANDLING LIBERTY LOAN SUBSCRIPTIONS

R. W. Morrison, assistant treasurer of the Pennsylvania Lines West, read the following report on handling Liberty Loan subscriptions:

The American people are not, as a rule, purchasers of bonds as are the people of other countries. Less than one-fifth of one per cent of the people of the United States owned bonds, and only a fraction of these were holders of government securities, prior to the Liberty Loan of 1917. It will no doubt be of interest to consider some facts about the first loan and the part taken by the railroad companies to make it a success. In response to the government's call for subscriptions to an issue of \$2,000,000,000 of 3½ per cent bonds, more than 3,000,000 people subscribed and the issue was 50 per cent oversubscribed.

A report of the Liberty Loan Committee of Railroads shows that through the efforts of railroad companies 241,280 employees loaned the government \$20,027,966. From reports made by sixty-seven railroad companies, whose total number of employees in May, 1917, was 910,917, there were 113,506 subscribers; a percentage of 12.4. The total payrolls for May, 1917, of these railroads was \$71,212,224; the amount subscribed by the employees was \$9,646,041, or 13.5 per cent.

The method employed by various railroad companies was very much the same, that was by having the employee subscribe for the amount of bonds desired, the company paying for them, and permitting the employee to repay on the installment plan, by making deductions from their pay on the payrolls, or in cash or check, as they might elect.

Of 25 companies checking their plans for repayment it is found that 15 had the subscriptions sent to the treasurer, 8 to the accounting department, one to the president, and one to a committee composed of the treasurer, comptroller and general counsel. Fourteen would refund to employees leaving the service the amount paid with interest. Five will refund only the amount paid and six make no mention of a refund. Three companies required repayment in 5 installments on the same basis as required by the government, 8 in 10 monthly installments, one in 11 installments, four in 12 installments, five in 20 installments, two in 22 installments, one required 10 per cent of salary to be paid each half month, and one does not state the number of installments in which the payments are to be made.

Briefly some of the main points of the plans are:

ATCHISON, TOPEKA & SANTA FE

Subscription blank to be sent to treasurer. Subscriber states amount of bonds desired but not the number. The treasurer prepares a separate blank for each employee in notifying heads of departments of amount of subscription and deductions to be made on payrolls. Application is made to the treasurer by head of department for refund to an employee leaving the service. Refund is made by voucher. Record of payments by employees is made on loose leaf kept by division and departments.

BALTIMORE & OHIO

Subscriptions sent to treasurer and by him acknowledged. Blank states amount of bonds desired, but not the number and denominations, also that the subscription is not revocable during period of employment. Treasurer notifies the auditor of disbursements of amount to be deducted on payroll. Record of payments by each employee is made on loose leaf. There is no statement of how refunds are made.

BOSTON & MAINE

Subscription blanks state the amount of subscription, but do not state number and denomination desired. Subscriptions are an order to the paymaster to deduct from the employees' pay 2 per cent of amount subscribed for from wages due for week ending June 1, 1917, 18 per cent for week ending June 15, 20 per cent for week ending July 13, 30 per cent for week ending July 27, and 30 per cent for week ending August 10. Employees desiring to pay by cash or check could do so by remitting to treasurer. Receipts given by treasurer and paymaster for all amounts received. Subscriptions were recorded in books in the order in which they were received, and after subscription closed were arranged in alphabetical order. No mention is made of how refunds, if any, were made.

BUFFALO, ROCHESTER & PITTSBURGH

Subscription blank states number, denomination, and total amount of bonds desired. The subscription blanks sent to the treasurer authorize deduction of 10 per cent of wages each pay day, but no deduction less than \$5. An employee leaving the service is refunded the amount he has paid with interest at 3½ per cent, but an employee who desires to discontinue payments and remains in the service is refunded only the amount paid. Employees are permitted to deposit bonds with the company for safe-keeping and it will collect the interest for them. Receipt is given to the employee by the treasurer for amount deducted from his pay. Record of payments by each employee is kept on loose leaf with full record of number and denomination and amount of bonds.

CHICAGO, INDIANAPOLIS & LOUISVILLE

Subscription blank states amount of bonds desired but does not give number and denominations. Record of payment is kept on subscription blank. An employee leaving the service is refunded the amount paid with interest.

CHICAGO, MILWAUKEE & ST. PAUL

Subscription blanks are in triplicate, one copy for payroll maker, one for paymaster, and one for the general auditor. The subscriber states the amount of bonds desired and amount to be deducted for 12 months. A record of payments is made on the reverse side of copy sent to the general auditor. The general auditor keeps all records of subscriptions and payments, but the treasurer acknowledges receipt of same. Payments made in 12 installments, but no mention is made of refund.

CENTRAL OF NEW JERSEY

Subscription blanks signed in duplicate, one part going to comptroller, the other to the Coal & Iron National Bank. Company makes deduction on payroll and pays money to bank. Bonds are held by bank until paid for. Refund of

amount paid without interest is made when employee leaves the service.

CHICAGO, BURLINGTON & QUINCY

Subscriptions sent to the treasurer. Payments to be made in 20 installments, when employees are paid semi-monthly, and in ten installments of those paid monthly. Record of payment kept in auditor's office on large sheet filed by divisions. Refund of amount paid with interest is made to employees leaving the service.

FLORIDA EAST COAST

Subscriptions sent to comptroller accompanied by 2 per cent of amount desired. Payments made in five installments on government percentages. Company makes deduction on payrolls and pays amount to First National Bank of St. Augustine. Employee discharged from railway service or entering military service is refunded amount paid.

GREAT NORTHERN

Subscriptions sent to the chairman, Great Northern Employees Liberty Loan Association provides for payment in ten installments. Refund of amount paid without interest is made to employees leaving the service. Record of payments kept on loose leaf.

ILLINOIS CENTRAL

Subscription blanks signed in triplicate, one copy sent to comptroller, one to office making the payroll and one retained by subscriber. An employee could subscribe for an amount not exceeding 25 per cent of his yearly salary. Payments to be made in number of installments as designated by applicant. Refund of amount paid without interest to an employee leaving the service.

LOUISVILLE & NASHVILLE

Subscriptions sent to the president provide for payment in 12 installments. Record of payments is made on a large sheet, but no mention is made of where the record is kept. Refund of amount paid with interest to an employee leaving the service.

LEHIGH VALLEY

Subscriptions sent to treasurer provide for payment in 12 installments. Record of payments is kept on back of blank. Company will take care of bonds for employee paying interest to owners. Refund of amount paid without interest made to an employee leaving the service. No special forms for accounting employed.

NORFOLK & WESTERN

Subscriptions sent to treasurer provides that payments can be made in ten or twenty installments. Certificate is given by treasurer to each subscriber for amount of his subscription. Record of payments kept on large loose leaf and filed by divisions. Refund of amount paid with interest if employee leaves the service.

NEW YORK, NEW HAVEN & HARTFORD

Employees subscribed by giving order on the paymaster. Payments made in five installments on government plan. Employees at Readsville shop given privilege to make weekly payments of \$1 each. Paymaster gives receipts for all payments. No mention is made of provision for refund if employee leaves the service. No other forms used.

NEW YORK, ONTARIO & WESTERN

Subscriptions sent to the treasurer provides for payments in semi-monthly installments of five per cent of subscription. No mention is made of provision for refund or other blanks used.

NORTHERN PACIFIC

Subscriptions sent to auditor of disbursements provides for payments in ten monthly instalments. Receipt of subscription is acknowledged by the auditor of disbursements.

The auditor furnishes each department with an alphabetical list of employees from whose pay deductions are to be made. Refund is made without interest by adding the amount to the payroll.

PENNSYLVANIA RAILROAD

Subscriptions sent to comptroller provides four ways of making payments.

(1) Subscriber may make full payment at time application is made.

(2) Make an initial payment at time of application and make monthly payments to any agent thereafter.

(3) Make an initial payment at time of application and authorize monthly deduction from wages.

(4) May authorize monthly deduction from wages.

Payments on monthly plan to be made in 10 installments. Company will take care of bonds for employees and pay them the interest by adding amount to payroll on last half of June and December. Refund of amount paid with interest if employee leaves the service or wishes to cancel his subscription.

SOUTHERN PACIFIC

An employee was given the privilege of subscribing for bonds to the amount of 25 per cent of his annual salary. Subscriptions were made in duplicate, original was sent to the auditor, the duplicate retained by the heads of departments making payrolls. Payments were made in 25 installments. The auditor kept a record on a large sheet of subscribers, and the amount paid each month, at the bottom of which is shown the total of deductions made each month. Employees leaving the service, or desiring to cancel their subscriptions, will be refunded the amount paid, with interest, by voucher prepared by the auditor. To all employees paying their subscriptions in full, interim certificates were delivered and receipt therefor taken in duplicate, one copy sent to the auditor and the other copy being retained by the treasurer.

ST. LOUIS-SAN FRANCISCO

Subscriptions sent to treasurer. Payments to be made in ten semi-monthly installments by deduction on payrolls. Deductions made for par value of the bonds and adjustment made by having the first interest coupon detached by the company and draft for \$0.48 per \$50 bond mailed by the treasurer. No mention is made of refund if an employee leaves the service.

SOUTHERN RAILWAY

Subscriptions made in duplicate, one sent to a committee of three, composed of the comptroller, treasurer and general counsel, the other copy retained by the head of the department preparing the payrolls. The comptroller acknowledges receipt of subscription, advising the employee of amount to be deducted from his pay in 12 installments. Deduction sheets prepared and sent to the comptroller monthly, who keeps all records on large loose leaf. An employee leaving the service is paid the amount deducted on the payroll, with interest at 3½ per cent.

UNION PACIFIC

Subscriptions sent to the auditor by employing officer. Payments made on installment plan in 20, or less, installments. Employee was permitted to subscribe for an amount up to 25 per cent of his yearly salary. Deductions sheet is prepared by head of department, showing all deductions made on the payrolls and transmitted to the auditor, who keeps record on large loose leaf, and acknowledges receipt of deductions made. If an employee is drafted in the army, the amount paid will be refunded unless the amount paid is sufficient to cover the price of one or more bonds, then the bond or bonds will be delivered to the employee, together with the amount in excess thereof that may have been paid.

WESTERN MARYLAND

Subscriptions were sent to cashier, and payments made in 25 semi-monthly installments. Account kept with employee on card on which record of all payments were made. An employee leaving the service was refunded the amount paid, with interest. Those remaining in the service could not cancel their subscriptions.

WABASH RAILWAY

Employees were permitted to subscribe on the installment plan for \$50 and \$100 bonds only. Those desiring the larger denominations were required to subscribe through their bank. Subscriptions sent to the comptroller and were payable in 20 semi-monthly installments. Employees leaving the service were refunded the amount paid with interest. No special blanks furnished.

PENNSYLVANIA LINES WEST

The treasury department issued a circular notifying the employees that they could subscribe for Liberty Loan bonds to any amount desired. Attached to the circular was a subscription blank to be filled out by the employee, stating the number, denomination, and par value of the bonds wanted, and authorizing deduction to be made on the pay rolls in ten equal installments stating the name of the company and the division on which employed, his occupation and location. In addition the subscriber was permitted to pay for his bond at once or in a less number of installments than ten, if he so desired. The employee was also notified that if he so desired the company would take care of his bond, the treasurer giving receipt therefor, keeping it in the company's vault subject to the owner's order.

These circulars were sent to the employees by the superintendents, and the subscription blanks detached and mailed to the treasurer in a special envelope. As the subscriptions were received at the treasurer's office, they were numbered consecutively as to division on which the employee worked, each division being designated by a letter. Upon receipt of the subscription blanks, a card was prepared giving the name of the subscriber, the number of his subscription blank, his occupation and address, the number, denomination, and par value of the bonds subscribed for. On the reverse side of the card, provision is made for a record whether the bonds are to be registered or coupon and if registered, the name and address, date of delivery of the bond, and how delivered, and if left in the custody of the treasurer, the number of the envelope in which the bond was filed. After the subscriptions had closed, the cards were separated as to departments and as nearly as possible the way the employees appear on the payroll.

From these cards was prepared in duplicate a list of subscribers, stating occupation, amount subscribed, and deductions to be made in each month from June, 1917, to March, 1918. The total amount subscribed and the monthly deductions shown on this list were balanced with the subscription blanks. The original of this sheet was forwarded to the superintendent for the purpose of having deductions made on the payrolls. Duplicate of the sheet was retained in the treasurer's office, and at the end of each pay period this sheet was turned over to the paymaster, who checked off the amounts deducted from the employees and from this sheet the record of payment was made on the employee's individual card. Receipts were not given to employees from whom deductions were made on the payrolls, but those paying by cash or check were given a receipt for the amount paid.

An employee leaving the service or desiring to cancel his subscription is refunded the amount due him with interest by draft on the Treasurer.

OTHER BUSINESS

At the Wednesday afternoon session a paper was read by J. P. Reeves, treasurer of the Chicago & Eastern Illinois,

on Pension Systems for Smaller Transportation Companies, which it was voted to print in the minutes of the meeting.

It was voted to give the executive committee power to cancel the next annual meeting if war conditions made it necessary.

The following were elected members of the executive committee: L. E. Katzenbach, treasurer of the Great Northern; E. H. Alden, treasurer of the Norfolk & Western; R. W. Morrison, assistant treasurer, Pennsylvania Lines West; F. M. Hickman, local treasurer, Missouri Pacific; and D. K. Kellogg, treasurer, Richmond, Fredericksburg & Potomac.

L. E. Katzenbach was elected president; Byron Cassell, treasurer and assistant secretary, Chicago, Indianapolis & Louisville, was elected first vice-president; and H. E. Suckling, treasurer, Canadian Pacific, second vice-president.

WHY SHOULD A RAILWAY EQUIP ITS LINE WITH BLOCK SIGNALS AND INTERLOCKING?

By Henry M. Sperry

Why should a railway equip its line with block signals and interlocking? There are two answers to this question. First, to provide for safety of train operation through signal protection. This is vital. Second, to provide for facility in train operation through signal direction. This is necessary.

Safety of train operation by block signals and interlocking is so well understood that it need not now be discussed. Facility in train operation is now of prime importance and for this reason a discussion of the important part that railway signaling is taking in facilitating the movement of traffic should prove of value.

Our railways are now handling the largest traffic in their history. It promises to increase under the increasing strain of war conditions. To meet this situation 693 railroad companies, under the direction of the Railroads' War Board, are working together to get the maximum service out of every car, locomotive and mile of track.

Maximum service means working every transportation unit to its capacity. The capacity of the car is the number of tons or passengers it will carry; of the locomotive its maximum tractive force, and of the track the number of trains that can be moved over it in a given time. The size and strength of the car determine the load it will carry; the power of the locomotive the load it will pull. The capacity of the track is determined by the speed of the train and the means employed to direct its movement. It is evident that in order to operate at maximum traffic capacity every factor must be considered so that the cars and locomotives will be loaded to their capacity and moved without loss of time. Splendid progress has been made, as shown by the Railroads' War Board report on freight operations for June.

	June, 1916	June, 1917	Increase, per cent
Average train load—tons.....	64.2	71.5	11.4
Average car load—tons.....	35.3	37.9	10.7
Average daily mileage per locomotive.....	68.1	70.7	8.6
Average daily mileage per freight car.....	27.3	29.1	6.6

The increased cost of locomotives and cars is a most urgent reason for working them to their capacity by cutting out lost time while on the road and in the shop. For example, locomotives now range in price from \$41,666 to \$63,000 for the Mikado and \$40,450 to \$73,850 for the Santa Fe type. This is an increase in prices ranging from 61 per cent to 92 per cent in from one to two years' time. Any means that seems at all promising should be considered. As will be shown, one of the most effective means of eliminating locomotive lost time, while on the road is by the use of automatic block signals and interlocking, as both have been found highly efficient in the direction of traffic.

The progress that has been made in the use of block signals within a five year period (1910-1915) is shown in the fol-

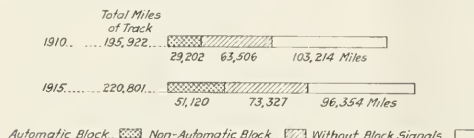
lowing table, together with other figures that should be considered in relation to this progress:

Main track:	1910	1915
Miles operated	266,185	291,232
Locomotives:		
Total number	58,947	65,099
Number per 100 miles	27.245	25.3
Average tractive force pounds.....	27,282	31,546
Freight cars:		
Total number	2,135,121	2,356,338
Number per 100 miles	887	915
Average capacity—tons	36	40
Block signals:	Miles of track	
Automatic	29,202*	51,120*
Non-automatic	63,506	73,327
Without block signals	103,214	96,354
Total passenger lines operated.....	195,922	220,801

* See Interstate Commerce Commission bulletin, January 1, 1911.

° See bulletin, January 1, 1916.

One significant fact in these figures should not be overlooked: the passenger mileage operated by the roads which appear in the annual bulletin issued by the Interstate Commerce Commission, in the five-year period (1910-1915) increased 24,879 miles, while the track mileage operated under automatic block signals in the same period increased only 21,918 miles. The proportions of automatic and non-automatic signals are shown below:



Passenger Mileage, Signaled and Not Signaled

The significant point in the figures shown is that the progress in the installation of automatic block signals is not keeping step with the annual increase in the miles of track operated. The report of the Interstate Commerce Commission for 1916 shows only 156 railroads using block signals and of this number 83 are less than 50 per cent equipped. There still remains a large mileage of passenger lines operated without block signals of any kind.

There are a number of reasons for this slow progress in the installation of automatic block signals. One of the important reasons is believed to be lack of information as to the economic value of automatic block signals.

Railway statistics cover almost every phase of railroad operation except that the data relating to railway signaling is confined to a yearly statement issued by the Interstate Commerce Commission showing the extent to which block signals are used on the railroads of the United States. No statistics are published by which it is possible to measure the value of railroad signaling, as the operating results obtained on the railroads on which they are in use are not published. In fact no general effort has been made to compile the information for publication. The reason, no doubt, is due to the fact that the railroads which have installed block systems and interlocking have found the results so satisfactory and so self-evident that no effort was made permanently to record them.

The urgent demand for increase in traffic facilities now makes it imperative to seek this information; and as evidence of its value the following striking examples of results obtained by the use of automatic block signals are presented to show what we may expect from a careful study of railway signaling as a means for facilitating traffic:

Information from a large railroad system with a net operating revenue of over \$3,000 per mile: extracts from letters sent to the operating vice-president:

1. By the superintendent of a division equipped with automatic block signals:

We have hunched traffic both morning and evening in and out of X, particularly in the evening when we handle nine regular trains in addition to

the fruit and stock trains, which are evening movements. It would be practically impossible to move freight trains between 5 and 11 without the block signals.

Working under the present eight-hour law I believe the system will pay for itself every six or seven years.

2. By another superintendent in charge of a busy division equipped with automatic block signals:

The chief dispatcher and myself know that we can move trains much faster with automatic block signals and get better service out of our men as a whole.

3. By another superintendent in the matter of saving over-time:

Now that we shall be required to make 12½ miles an hour with all freight trains or pay overtime, the signals will be of great benefit.

4. By the man who actually directs the trains' movements—the chief dispatcher:

They are a great success and delay reducer—they cut down delays from one to two hours on freight trains between A and B [the distance between A and B is 94 miles].

5. By the signal supervisor, pointing out their value in protecting traffic:

The following is a record which I have kept since January, 1916. It includes the number of trains which were stopped on account of danger ahead other than a train in the block. These are dangerous conditions which the train dispatcher could not prevent.

12 train stops on account of broken rails.

13 train stops on account of switch partly open due to snow and ice.

6 train stops, cars and engines not clear of the main track.

4 train stops on account of telegraph poles torn down by ice jam causing dangerous condition.

6. Information compiled by a large railroad of which the greater part is single track. This road has had nine years' experience with automatic block signals and now has over 700 miles of its single track equipped.

The following was taken from information furnished by the signal engineer:

The northern division is 98.6 miles long of which 78 miles are single track. Prior to 1908 the division was operated under manual block system with block operators at every passing track, averaging four miles apart. Automatic block signals installed in 1908. After the automatic signals were installed the average time per freight train was reduced two to three hours.

This officer further states that the saving in wages of block operators, not required under the automatic block system, is an offset to the charges under the automatic block system for interest, maintenance and operation.

There are good reasons for the belief that the results obtained on these two large railroads do not differ greatly from the experience of other roads equipped with automatic block signals. If the satisfactory results obtained from the use of automatic block signals are to be extended over the railroads of America, it is evident that a substantial annual increase must be made to equip at least 50 per cent (a modest estimate) of the track used by passenger trains with automatic block signals; and there can be no question as to the importance of decreasing the mileage now operated without any kind of block signals, either automatic or non-automatic.

PULVERIZED COAL FOR CENTRAL OF BRAZIL.—The Central Railroad of Brazil has inaugurated a series of experiments with its new coal-pulverizing plant at Barra do Pirahy, which has caused considerable interest and comment in engineering circles here generally. The plant was furnished by an American firm, was installed here by one of its engineers, and is said to have cost between 2,000 and 3,000 centos of milreis (about \$500,000 to \$750,000 United States currency). The pulverizer is described as being similar in construction to a cement plant. The coal, freed of its moisture, goes into a hopper and is pulverized so that 80 per cent of it can pass through a 200-mesh screen. It is then passed to the locomotive by means of a conveyor screw and blast, thus bringing the ignitable powder to the mouth of the locomotive furnace, at which point combustion takes place. The recent experiments were conducted under the direction of Dr. Assis Ribeiro, a well-known Brazilian engineer, who is assistant director in charge of locomotion for the Central Railroad. The experiments were carried out entirely with American coal and were an unqualified success.—Commerce Report.

A Proposed Code of Car Service Rules*

Carefully Prepared Set of Regulations for Interchange
of Freight Equipment to Correct Present Deficiencies

By Transportation Officer

A RAILROAD is built and maintained for the specific purpose of furnishing transportation. The principal revenue is derived from freight transportation. The cost of building and maintaining a railroad and the cost of maintaining engines and cars, all overhead expense, interest and everything that enters into the cost of getting ready to do business has increased possibly 100 per cent during the past 15 years, and the operating costs are still going up. Of course, they are abnormal now, but even under normal conditions, the tendency has been constantly upward. Therefore, granting that we have a plant ready to do business, the cost of which has increased enormously in recent years, and knowing absolutely that an empty car is a constant expense, it is only ordinary common sense to say that any set of car service rules should accomplish the following results: (1) The return of the car to the owner with reasonable promptness. (2) Its loading in both directions as far as practicable. (3) In the event an empty movement is absolutely necessary, it should be in a homeward direction and should be as short as possible.

In moving cars home empty, we have heretofore had an idiotic method of hauling them over the identical route they happened to have traversed loaded; thus, it has been customary constantly to haul cars away from instead of towards home. This results in absolute waste in transportation expense and much wear and tear on the cars.

The railroads of this country should band themselves together to accomplish three or four things. (1) A system that will get cars back to their owners at some time, with due regard to car efficiency. Then enough cars of each class must be built to enable all of the railroads of the country to handle cars loaded in both directions. It is an economic crime to haul foreign cars home empty and system cars in the reverse direction, when one car would take the load back. (2) A car with standard repair parts should be devised, and in the meantime the Master Car Builders' Association should make some arrangement, particularly during these war times, to authorize the repairing of foreign cars with wrong parts without penalizing the repairing line. Cars are now held up for months at a time awaiting the receipt of a small repair part. (3) Foreign cars received on a line should actually be repaired the same as the owners' cars. (4) When it is positively necessary to haul a foreign car empty over any portion of the way to get it back to its owner, the car should be sent the shortest instead of the longest way.

Cars should be constructed for interchange traffic that can be loaded in both directions. For instance, coal from the West Virginia, Ohio and Pennsylvania fields going into the west and northwest should not be loaded in hopper cars, as this entails a return haul empty from a territory where there is a loading, either for an open top car or a closed car of some description. The use of hopper cars should be confined to the local territories of the owning roads, and is only justified where there is no return loading for the cars.

The rules which are suggested below provide for the minimum empty miles. In order to accomplish this, where empty mileage is necessary, all of the roads must band themselves together in a common unit and operate such

cars as may be hauled empty the fewest miles. If injustice is meted out to any line, the adjustment should be through some accounting method which is inexpensive, rather than in the physical movement of the car. It is generally acknowledged that the rules in effect prior to February 21 (and these were changed from time to time) which provided no penalty but depended upon mutual affection and brotherly love for their observance, were entirely obsolete so far as controlling the equipment is concerned, and further, that the rules effective February 21, which provided a small penalty, were little better. The penalty was so small that employees of railroad companies took a chance that the rules would never be enforced, or that they would never be found out, and that if they were, they could well afford to pay \$5 in order to secure a load that might net their company anywhere from \$50 to \$400. Therefore, it would seem that it is absolutely useless to issue another set of car service rules based upon any mutual paper agreements which are never maintained, because while one set of roads may carry out the agreement, others cannot or will not, and the thing breaks down of its own weight.

It is obvious that if it is really desired to get up a set of car service rules that will result in the return of the car to the owner, there must be an adequate penalty which will make the use of the car unprofitable. I believe the penalty of \$50 provided in the rules below will accomplish this result, but if it will not, it should be increased to such an extent as to bring about the desired result. It is certainly much better for the railroads to establish a penalty that is within reason than to have the government issue a set of rules that will establish a diversion penalty that will be burdensome.

These rules are based upon the following principles: (1) Common box cars are pooled on the basis of cars contributed, or an equivalent thereof. (2) All other equipment is classed as "Special" to the owning line. The originating line is expected to provide sufficient equipment of this class to take care of the business which it originates with the understanding that when this equipment is empty at destination every movement of the car should be in the interest of its prompt return to the owner, under as liberal rules as possible to prevent unnecessary empty mileage.

It must be conceded that no railroad will provide the capital to build equipment for someone else, and that any pool that is constructed must be based upon the basis of ownership or an equivalent, and the rest of the equipment must be handled under a separate set of car service rules which will absolutely secure the return of the car to the owner within a reasonable time. It seems to have been determined that it is practically impossible to handle box cars on an ownership basis; therefore, the only thing left to do is to handle them in a pool. This eliminates all waste in empty mileage, and it rests with the head of the pool to see that the box cars are properly distributed, that adequate penalties are meted out for a failure to carry out the instructions of the commissioner, and that each line having an excess of equipment over and above what it is entitled to, in accordance with what it contributes, shall contribute to the owner an adequate amount over and above the per diem rate for the use of its excess equipment. This amount should be based on the earning capacity of the cars. In the opinion of the writer there is no reason why every line that secures a proportion

*Received in the contest on car interchange which closed June 10, 1917.

of the rate should not contribute its quota of cars. The pool should be so regulated that there will be an equalization during a time of surplus as well as during a time of shortage. This equalization can be so arranged that there will be no actual unnecessary movement of cars in order to accomplish a just equalization in money.

Every manipulation of the pool, and the handling of the other equipment under an ownership basis, should be with a view of eliminating every unnecessary mile of switching or terminal expense, thus securing the highest efficiency possible. To do this, all roads must constitute themselves as a unit in the handling of empty cars, where an empty haul is necessary, and instead of spending hundreds of thousands of dollars to home-route cars, and the manipulation of equipment on the basis of each individual car, these empty cars must be so handled that the car actually moves the least number of miles to get home. If there shall be an injustice done to any subscriber line, it should be adjusted between the roads as a whole on the basis of the empty mileage handled, rather than to make any attempt to handle each car on its record rights, which has resulted in the unnecessary wastage of millions of dollars in this country.

Under the old rules cars have been handled directly away from home in innumerable cases, in order to get the car back to some specific junction point that it may then retrace its steps over another road through identically the same territory, thus wearing out the cars, creating unnecessary mileage and decreasing efficiency. There is also a heavy empty mileage created on account of the condition of equipment and the fact that while the M. C. B. rules provide that foreign cars must be repaired the same as those belonging to the owner, this in effect is not done. There are thousands of cars interchanged today which could be made available for loading for a small expenditure of money, but they are returned to the owner in order that the line that has them may get rid of doing the work, because it has all it can do to take care of its own cars. However, the other fellow is taking the same action, and in the end what we have is a large transportation expense.

As these rules provide that the box car equipment, which is used as the medium of interchange, is pooled, the rules for the handling of the balance of the equipment classed as special equipment, should be tightened up to some extent, but still leave sufficient flexibility to prevent unnecessary handling of empty cars. This I have tried to cover. It will be observed, for instance, that it is provided that once a foreign car reaches the tracks of a railroad having direct connection with the owner, there is no other outlet than the delivery of the car to the owner, loaded or empty. The writer believes this is absolutely right and just, and that it is necessary to encourage car owners to provide themselves with equipment. A road which serves coal interests provides itself with equipment to take its coal to market, and it is therefore justly entitled to the return of these cars. Unless they are returned the shippers on its line will not be provided with transportation facilities. It should be expected by the owners of this special equipment that the cars will be loaded in return movement wherever that is possible under the restrictions named. Under no circumstances should we assume that any class of equipment should be returned empty that can be loaded, as it would in many instances double the cost of furnishing transportation to return a connecting line's cars empty and then haul cars empty in the opposite direction. This not only creates unnecessary expense, but would compel us to increase our equipment to handle a given traffic.

The car service rules effective February 21, provided that cars may be back-hauled once. This rule was impracticable in that it is almost impossible to keep information with the car at all times showing what service it had performed. Our rules provide that a car received from a connecting line may

be handled as desired, but it must be disposed of in accordance with the rules within 30 days in order to escape penalty. The penalty rate for the first 30 days is fixed at \$0.50 per day; for the second 30 days, \$2 per day, and for any additional period, \$5 per day.

Under the old penalty rule the delivery of a car to a belt line, or a road for return loading, broke the penalty and thus nullified the intent of the rule, which was to get the car home. This has been covered here by a provision that such delivery will not break the penalty, provided the car is returned to the delivering line within 30 days.

When it comes to handling cars belonging to indirect connections the writer has endeavored to be as liberal as possible, with due regard to keeping the car moving toward the owner at all times. These rules provide that a car may be moved locally loaded or empty but when delivered off the line it must always move in the direction of the nearest junction point.

In the absence of any loading in accordance with the various options given, the car must be short-routed empty to the owner at the nearest junction point, and every line must receive and haul cars in home route regardless of whether they handled them under load or not. This is the rule now in effect on gondola cars, as promulgated by the Commission on Car Service, and it is increasing the efficiency of coal movements wonderfully, by cutting out unnecessary empty haul and saving a vast amount of money in getting the cars back to the owner. If an injustice is done to any road it may appeal to the Arbitration committee.

We have also provided that cars may be returned empty to the delivering line by certain railroads to be enumerated by the American Railway Association, and published in the Equipment Register, having in mind that roads, such as traction lines and short line railroads will not be able to find loading in accordance with Rule 3, and that, therefore, cars must be returned empty or loaded to the delivering line. However, as between trunk lines, or roads of their length, there is, in our judgment, no reason why the cars should not be handled strictly in accordance with Rule 3. Where it is necessary to haul a car home empty, these rules provide for getting it home the nearest and the cheapest way. Once a car is billed home to the owner empty it may, of course, be loaded by any line over which it passes, so long as it is loaded in accordance with the rules. The elimination of the charge for hauling an empty car will cut out an enormous amount of unnecessary accounting.

For the delivery of a car contrary to these rules we have provided a penalty of \$50. It has been our experience that rules that bear no penalty are inoperative and a small penalty will not cure the evil. The penalty must be sufficiently high to make it absolutely unprofitable to misuse a car. I am firmly convinced that unless it is done, any separate set of rules originated and put into effect by anybody, will be absolutely ineffective. I am likewise convinced that unless we put into effect both a diversion penalty and a time penalty, the Interstate Commerce Commission, which now has the authority, will issue a set of rules and the penalty for the infraction of these rules will be much more severe than is here contemplated. Indeed, I am not so sure but that this diversion penalty should be \$100 instead of \$50.

The home-route car is unnecessary in the handling of cars under these rules. This will save an enormous amount of money in stationary and unnecessary empty hauls. Under the rules proposed below the cars are handled in accordance with the initials stenciled on the cars, and they are kept moving loaded or empty in the direction of the owning line.

In the event these rules should be applicable to common box cars at any time, an additional clause should be added to Rule 2d which could provide that in the event the

balance as between any two trunk line carriers shall be in excess, say of 10 per cent of either line the deficient line shall have the right to take cars belonging to a direct connection out of an interchange point to some point on its own line for return loading in accordance with Rule 2.

A PROPOSED CODE OF CAR SERVICE RULES.—To govern all equipment other than common box cars, which are pooled.

RULE 1. (A) Foreign cars must be utilized as far as practicable for loading to other lines, in accordance with Rules 2 and 3 in preference to system cars.

(B) Any road shall have the right to agree with any other road to deviate from Car Service Rules 1, 2, 3 and 4, inclusive, in the handling of cars.

(C) The movement of a *foreign car* except as provided

(D) A subscriber* road receiving a loaded car from a in these rules will constitute a diversion.

(E) A non-subscriber** road, an industrial road or a shipper, must require that such car be routed in accordance with Rule 2 or 3.

(F) Thirty days will be allowed each line at the current per diem rate. A penalty will be added for all time held in excess of 30 days as indicated in Per Diem Rule No. 3. The delivery of a car empty to a connecting line for return loading, or to a belt or switching line for loading or unloading, will not break the penalty rate, provided the car is returned to the delivering line within 30 days.

RULE 2. A car belonging to a *direct connection* may be: (A) Moved locally loaded or empty. When delivered off the line it must be:

(a) Returned to the owner direct, or

(b) So loaded that the owner will participate in the freight rate.

(B) If empty at a point of interchange with the home road the car must be confined to the switching territory of the holding road. If there is no loading at that point to or via the home road, it must be returned to the owner empty.

All lines interchanging cars at a common point or within switching limits, either over their own rails, through an intermediate line or lines, or via a car ferry or float, within such switching limits, shall be considered a direct connection under these rules. This information shall be published in the Official Railway Equipment Register, and when the interchange is other than via their own rails, the channel through which interchange is effected must be shown.

Note: Where a movement of traffic, in the opinion of the carriers interested, requires the return of empties belonging to such lines at the junction point where delivered loaded and such carriers fail to agree, an appeal may be made to the Per Diem Rules Arbitration committee, whose decision in the matter shall be final.

RULE 3. A car belonging to an *indirect connection* may be: (A) Moved locally loaded or empty. When delivered off the line it must be:

(a) Loaded to any point in the direction of, but not beyond, the nearest junction point with the owner, or

(b) Loaded via any route so that the owner will participate in the freight rate, or

(c) Loaded to any interchange point with the home line, provided, however, that the car must be routed over the home line where common rates apply, or

(d) It may be returned to the delivering line, if in a homeward direction, but not otherwise. Traction lines and such other lines as may be designated by the American Railway Association may return foreign cars to the delivering line, a list of such roads to be published in the Official Railway Equipment Register.

(B) Short routed to the owner at the nearest junction

point, without charge. Such a car may be loaded in accordance with these rules, by any line over which it passes en route home.

RULE 4. (A) A loaded foreign car may be delivered to a switching road to be unloaded within the switching district. Such delivery shall be indicated on the junction report by the letters "F. U."

(B) If the car belongs to a direct connection of the switching line at that point, it must be handled in accordance with Rule 2.

(C) If the car belongs to a direct connection of the switching line, outside of the junction point at which it was received it must be loaded in accordance with Rule 2, or it may be returned to the delivery line, provided its movement is confined to the switching territory.

(D) If the car belongs to an indirect connection of the switching line, it must be loaded in accordance with Rule 3, or returned empty to the delivering line, provided its movement is confined to the switching territory.

(E) An empty foreign car belonging to an indirect connection of the delivering line, and the line to which it is delivered, may be delivered to a connecting road for return loading. Such delivery shall be indicated on the junction report by the letters "F. L." The loading road must route the car in accordance with these rules. If a car is loaded within a switching district the carrier line shall be responsible for its correct loading.

(F) A car belonging to a direct connection of the switching line, outside of the switching district, may be delivered to it to be loaded within the switching district and returned to the delivering line. The carrier line shall be responsible for its correct loading and the car will be treated as belonging to a direct or indirect connection of the carrier road.

(G) A car belonging to a direct connection must not be delivered to a connecting line for return loading, unless it is to be loaded within a switching district, it being the intention that once a foreign car gets on to any road that has a connection with the owner *it must go home*.

A BOX CAR POOL

Box cars are to be pooled on the basis of ownership, each line to be entitled to its ownership in box cars or the equivalent. The pool shall be based upon the following principles:

1. No box cars of less than 60,000-lb. capacity are to be put into the pool.

2. In order that cars may be loaded in both directions, so far as practicable, a definite standard of excellence shall be established, and no cars shall be offered in interchange that do not measure up to this standard.

3. All railroads, including switching and belt lines, shall, within five years, be required to provide themselves with sufficient equipment to take care of their proportion of the through haul, as well as their local requirements; provided, however, that such roads may be excepted from this order by the American Railway Association as it may deem necessary.

4. Until such time as purely switching lines, belt lines, and so-called tap lines, which originate traffic and own no cars, provide themselves with their quota of equipment, such cars as are delivered to such lines will be charged to the delivering line until they clear to another carrier line.

5. Each member of the pool shall be entitled to the number of box cars on its line, including those charged to belt, switching or tap lines, as provided in Rule 4, as contributed by it to the pool.

6. During a car shortage, when any member line is short of its ownership, it shall be entitled to such compensation per car per day, in addition to the regular per diem, for the cars it is short, in accordance with the cars contributed to the pool, as may be determined upon by the members of the pool.

* Subscriber—A road which is a subscriber to the Per Diem Rules agreement.

** Non-Subscriber—A road which is not a subscriber to the Per Diem Rules agreement.

7. Equipment shall be equalized during times of surplus in an equitable manner, either by the actual movement of cars, or by a proper credit to a line having a surplus, in order to avoid unnecessary movement of cars when they are not needed by the deficient lines.

8. The pool commissioner shall have supreme authority in the matter of handling cars, and his instructions shall be obeyed implicitly. There shall be an adequate penalty established for failure to move cars as ordered by the commissioner, and also a penalty rate paid over and above the regular established per diem rate on all cars held in excess of ownership during a car shortage.

9. Per diem settlements shall be made at the current per diem rate with all car owners. Any excess paid by lines having more than their allotment shall be paid to the pool, to be distributed by them to the deficient lines.

CODE OF PER DIEM RULES

RULE 3. Foreign freight cars must be handled as prescribed in Rules 1, 2, 3 and 4 of the Code of Car Service Rules of the American Railway Association, subject to the following penalties:

Diversion Penalty: A road diverting a foreign freight car shall pay to the owner thereof the sum of \$50 in addition to the per diem.

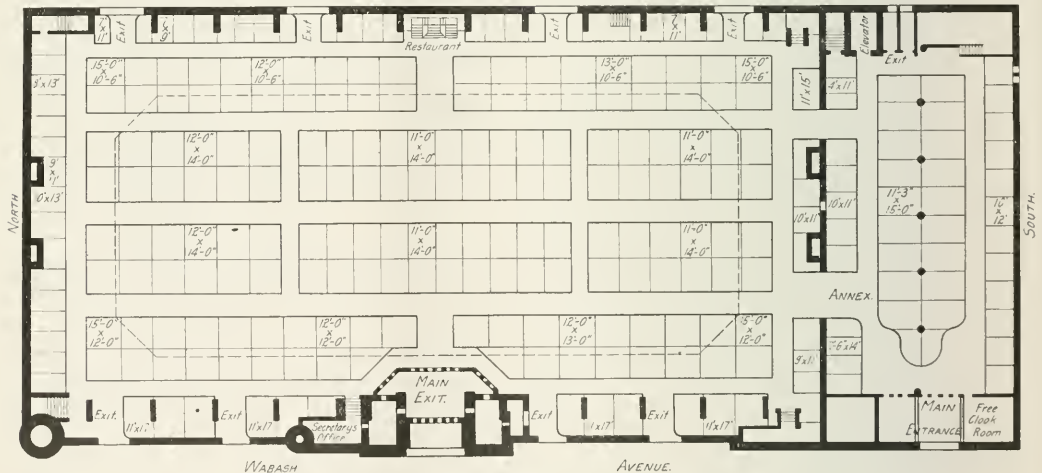
Time Penalty: If a foreign freight car is in the possession of a road for any period over 30 days, computed as per Rule 1, Paragraph E, such road shall pay to the owner

PLANS MATURED FOR N. R. A. A. EXHIBIT

The National Railway Appliances Association has made full announcement to its membership of the plans for the exhibition of railway appliances to be held in the Coliseum and Annex, Chicago, March 18 to 21, 1918, inclusive. This annual exhibit has grown from a small beginning until it is now one of the largest and most successful of its kind, the principal difficulty confronting the management in recent years being to provide the space desired by those applying for this privilege. The association expresses the confident hope that the tenth exhibit, to be held next March, will be one of the best in the history of the organization.

A floor plan of the exhibition space, shown in the illustration, has been sent to interested companies. Special attention is called to the fact that the main entrance to the Coliseum is through the Annex, as in the 1917 exhibition. The principal change in the floor plan is the elimination of the wide center aisle running across the building opposite the main exit and a slight rearrangement of the spaces to provide 31 additional booths. The association received 68 applications for exhibit space last year which could not be filled and of these 31 companies availed themselves of the privilege of membership in spite of the fact that they could not secure space in the Coliseum.

The prospects for a successful exhibit this year are highly encouraging. Within a week of the mailing of the notices to members, 45 applications for space were received and on



Floor Plan of Coliseum and Annex for the N. R. A. A. Exhibit Next March

thereof a penalty rate of \$0.50 per day for the first 30 days' excess time, \$2 per day for the second 30 days and \$5 per day for any additional period in addition to the per diem rate for the further use of the car; except where such penalty is not reported to car owner within 6 months after the last day of the month in which it accrued, the time penalty rate shall be increased \$0.10 per car per day.

In case either of the above penalties is not reported to the car owner within 12 months after the last day of the month in which it accrued, the car owner shall have the right to show a deduction of the amount in its first open per diem report.

Where a car is delivered to a switching road to be loaded or unloaded and is returned to the delivering line, or where a car is delivered empty to a carrier road for return loading, such delivery will not break the time penalty, providing the car is returned within 30 days after delivery.

October 22, two weeks before the spaces will be allotted, over 80 per cent of the area available had been applied for.

The general arrangements for the exhibit are the same as in previous years, although a number of minor changes are announced. A new plan for handling power and lighting service will be used and no nickel telephones will be placed in the booths, as in past years. The association will provide ample telephone service at the southwest corner of the main building which may be used at 5 cents per call. The association will also provide uniformed attendants and messengers to take care of incoming calls. Another important provision for the 1918 exhibit is that no one will be allowed in the building during the erecting and dismantling period without a workman's pass. The detailed arrangements for this exhibit are in charge of the secretary-treasurer, C. W. Kelly, 349 Peoples Gas Building, Chicago.

Western Railway Club Meeting at Chicago

Locomotive Terminal Delays the Main Topic of Discussion. Addresses By H. T. Bentley and Samuel O. Dunn

THE Western Railway Club met at the Hotel Sherman, Chicago, on October 15. H. T. Bentley, superintendent of motive power and machinery of the Chicago & North Western, read a paper on Locomotive Terminal Delays, which was followed by considerable discussion in which A. R. Kipp, president of the club, and mechanical department officials, particularly roundhouse foremen, participated. Samuel O. Dunn, editor of the *Railway Age Gazette*, delivered an informal address, which, together with Mr. Bentley's paper, is abstracted below.

LOCOMOTIVE TERMINAL DELAYS

By H. T. Bentley

Superintendent of Motive Power and Machinery, Chicago & North Western

While the subject of this paper is Locomotive Terminal Delays, it might just as well be called "Keeping Engines Moving, or How the Round House and Shop Men Are Helping to Win the War." One of the vital needs of the country at this time is a prompt movement of engines from their arrival at the coal shed until they are ready for service again so as to handle properly not only the troops, but also the ammunition, grain, and other commodities that are just as necessary to bring the war to a successful ending as are the boys in the trenches.

I am not going into technical details, but will simply enumerate a few things that help to expedite engine move-

ment of engines are waiting to be coaled, the last engine in can get water without having to switch all of the others or wait until they are moved up past the penstock. In the case of a busy terminal, a separate penstock for switch engines is a great time saver. All spouts should be large enough so that no unnecessary delay occurs when taking water.

An engine washing device located outside with proper drainage so that water will be carried off to the sewer.

The turntable should be power operated and the tractor house so located that the operator can see the rails at both ends. A recent installation of a large table came to my notice where the operator could not properly see the rails at either end, making it necessary for two men to be employed where only one would have been needed if the house had been properly located.

It is hardly possible under present conditions to get along without having the use of oxy-acetylene and electric welding outfits in a round house. Numerous terminal delays can be saved with these outfits almost every day, especially in bad water territory where firebox and flue troubles are serious. The welding of flues does overcome delays and the extension of this practice should be considered, although we are told, that unless equipped with welding apparatus in the round houses to follow the work up, there may be some difficulty experienced in case of leakage.

Labor saving devices of all sorts never were in such great demand as at present, and the men who were far sighted enough to equip their shops, engine houses, and engines with them are now reaping the benefit.

A portable electric light cluster with a reflector is a great help to a difficult night job; there ought to be one or more in every busy round house. For reducing terminal delays they are a good investment and easily made.

The dropping of wheels to replace driving box brasses and take up lateral motion is a big job, but with proper devices applied to your engines, much terminal delay can be overcome; we have recently had two engines come to the shops for the first time in five years for driving wheels to be removed. During that time, side play was taken up, new brasses applied and tires changed without dropping the wheels.

The hot water washout plant has been in service long enough to fully prove its usefulness in conserving coal, water and time.

The emptying of sand boxes to make repairs to sanders or to get rid of wet sand is the cause of lots of delays and profanity, both of which can be overcome by proper attention in shops by knowing that joints are water tight and using a sander that can be repaired from the outside without the necessity of emptying the box and spilling sand over the machinery.

The retaining of heat in a boiler, where such action can be taken, not only helps overcome delays, but conserves wood and coal, both of which are in great demand. In some tests made a few months ago, it was shown that it took about twice the amount of steam from the blower line to raise steam on an engine when cold, as compared with one with hot water in the boiler. We periodically talk about covering stacks and sometimes do it, but after a while the practice is dropped. We all know that heat, or its equivalent, dollars and cents, can be saved by covering the stack of a hot engine, then why don't we do it?

What delays can be charged up to an inadequate blower

Report of Delays to Engines in Terminal Service

Date _____ From _____ To _____

ENGINE	Arrived	Time Ordered	Departed	Total Delay	CAUSE OF DELAY

Foreman _____

Report for Recording Delays to Locomotives at Terminals

ments at terminals. First of all the round house foreman must be a hustler and a good all around man, one who has the good will of the men. I believe the round house foreman is entitled to more of our consideration than is sometimes given him.

The following are some of the many good investments for a busy round house.

Coaling facilities that will coal engines quickly without spilling coal on the ground to be shoveled into cinder cars or otherwise wasted.

Clinker pits where cinders can be handled with the greatest dispatch and the least amount of labor.

Sanding apparatus that will quickly deliver the sand in the box instead of on the boiler and the running board, and so located that the tender can be filled at same time.

Penstocks or water tanks properly situated so that if a

system, and why doesn't someone get up a device that will be effective and more economical. The condensation that takes place in a blower line from the boiler room, around the house and then to the locomotive is simply a waste of coal that some inventive genius should be able to overcome. A blower line is a good condenser, but not a very economical medium for steam raising.

The firing up of locomotives is a job that is done hundreds of times every day, and if any member has a method of doing this more economically and quickly than by the practice of using wood and coal and will tell us about it, we may be able to save a few minutes or a few shovels of coal on each fire.

Men speeding up their work in the shops and round houses, and doing it well are just as much entitled to credit as people in other occupations who are doing their bit for this glorious country of ours.

The drawing office is sometimes responsible for delays in round houses, and if the round house foremen were consulted more often by the mechanical engineer, many annoying delays due to poor design or inaccessible parts would be overcome.

It is possible that some of us are still doing some things that are not absolutely necessary, you might call them "frills." A short time ago we held a staff meeting at which this subject was discussed, and decided to postpone doing some things not detrimental to the service, until a more opportune time.

Engineers can save delays at the terminal by correctly reporting the work that actually needs doing; the work slip that shows a bad pound on the right side, or packing blowing without saying where, or the air pump not working, or something wrong with the injector, causes lots of unnecessary work looking for a defect that should have been located in service and which in some cases is difficult to find on a dead engine. Coal can also be saved by the engine crew not coming to the clinker pit with a lot of green coal in the fire box, as it is only knocked out and wasted; we cannot afford to waste coal at any time, but now to do so is almost a crime.

The open sided clinker pit with a depressed track for cinder cars is a question whether there is not something that requires less labor and can handle cinders more economically.

A copy of our "Delays to Engines in Terminal Service" report is shown herewith, from which it will be seen that very little work is required to give information as to the total delay and the cause.

A more elaborate report used by the Pennsylvania Railroad was described and illustrated in the *Railway Age Gazette*, pages 595 and 596 of the October 5, 1917, issue, and a full explanation is given as to the method of handling it. While these reports, of course, require some one to keep track of all movements and delays, yet the information given enables the master mechanic to put his finger on irregularities and correct them.

Most of us are able to say what we could do if we had all the improvements we might think necessary, but as it is impossible to get some of those things now, it is up to us to utilize the facilities we have to the best advantage to keep the wheels moving; by getting good results under those conditions we really are bigger and better men than if surrounded with every convenience for turning engines promptly. Difficulties bring out a man's resourcefulness, and the more difficulties successfully overcome, the more valuable is that man to his employers.

DISCUSSION

Some roads reported that at the present time the average service obtained from locomotives has been increased to 6,000 miles per month in freight service and 9,000 miles per month in passenger service. The practice of filling tenders not quite to the top has been adopted by one road to con-

serve coal and save labor at the terminal. The necessity for power operated devices for handling cinders was emphasized by one of the speakers, who told of a terminal employing eight laborers on this work, where it was necessary to hire 42 new men in a single month. Several roads were reported to be using stack covers; some are attached to the stack, while others are suspended by chains inside the smoke jack. It has been found necessary to have an opening from 2 in. to 4 in. in diameter in the cover to prevent the engine sweating. As an instance of the special methods used to keep power in service, a foreman at one locomotive terminal told how one-eighth inch was removed from the flanges of an entire set of drivers without dropping the wheels by means of a cutting tool attached to the frame of the locomotive.

ADDRESS BY SAMUEL O. DUNN

The presentation of Mr. Bentley's paper was succeeded by an informal talk by Samuel O. Dunn, editor of the *Railway Age Gazette*, on the railway situation. Mr. Dunn called attention to the fact that the railways in the year 1916 handled about 25 per cent more freight traffic than in 1915, and that on top of that they are handling in 1917 a vastly larger traffic than they did in 1916. The freight traffic handled in July, 1917, was 20 per cent greater than that handled in the same month of 1916 and 48 per cent greater than that handled in the same month of 1915. The increase in July, 1917, over July, 1915, was equal to the total freight traffic handled in a year before the war by the combined railways of Japan, Spain, Sweden, New South Wales, Switzerland and Brazil. This great increase in traffic has been handled with practically no addition to the available equipment, which showed that there had been a great augmentation of the efficiency with which equipment was being handled. In spite of the fact that the total business being handled, passenger as well as freight, is now the greatest in history, the tendency of net operating income is to decline.

In the first six months of 1917 gross earnings were 12.2 per cent greater than in the same months of 1916, while operating expenses were 18½ per cent greater, taxes were 17½ per cent greater and net operating income was 3.7 per cent less for the railways as a whole.

Furthermore, during this period transportation expenses increased over 26 per cent, while expenditures for maintenance and equipment increased only 12½ per cent and expenditures for maintenance of way only 7.6 per cent. These increases were relatively so small that they would not cover the increased cost due directly to advances in wages and in the prices of materials and the only rational conclusion that can be drawn is that railway properties are not being maintained to as high standard as they were a year ago. When we entered the war it seemed that the most difficult problem of the railways would be that of moving the tremendous traffic which would be offered to them. Thus far, however, they have been able to do this and it begins to appear that the problem of adequately maintaining the properties will prove to be an even more difficult one. The obstacles encountered in getting a sufficient amount of labor and sufficient materials and the high wages of labor and the high prices of materials are likely to make the problem of maintenance increasingly difficult, but the speaker believed that the loyalty, the ability and the energy of the railway officers and employees of the country would find means for solving the problem. The fact that net earnings are declining while the roads are handling the largest traffic in their history shows the need for advances in rates, and Mr. Dunn predicted that if the railways continued to render the splendid service to the public that they have been rendering since the country entered the war public opinion would compel the regulating authorities to grant the needed advances in rates.

State Railroad Legislation Passed in 1917

Laws Affecting Strikes, Grade Crossing Protection, Wage Payments and Trespassing on Railway Premises

SOME of the more important of the 140 laws relating to railway operation passed by state legislatures in 1917 are abstracted below. Similar laws passed in different states have been grouped together as far as possible.

LABOR LEGISLATION

New Jersey House Bill 223 repeals the excess train crew law of 1913 and empowers the Public Utilities Commission, after notice and hearing, to direct any railroad to employ such a number of employees on its trains as the commission deems necessary to enforce safe, adequate and proper service for the protection of the public and the employees of the road. The act prohibits the reduction of the number of men in train crews without the authority of the commission.

Utah House Bill 10 and Minnesota House Bill 18 authorize the organization of labor unions and prohibit state courts from granting injunctions in any case growing out of a labor dispute unless necessary to prevent irreparable injury to property or property rights, for which there is no adequate remedy at law. New Hampshire House Bill 322 prohibits any employer from soliciting or advertising for employees during a strike without stating plainly that a strike exists.

Ohio House Bill 107 and Michigan House Bill 116 prohibit a railway from discharging or disciplining an employee on information involving his honesty, integrity or a breach of rules furnished by a special agent, detective or spotter, without advising the accused of the specific charges against him and giving him an opportunity to be heard.

Wisconsin Joint Resolution 72 declares against the setting aside or abatement, even temporarily, during the war, of laws designed to safeguard the rights of laborers.

West Virginia Senate Bill 62, North Dakota Senate Bill 78, New Mexico House Bill 24, Nebraska House Bill 33, and Tennessee House Bill 264 require railroads to pay wages semi-monthly.

LAWS AFFECTING TRESPASSERS

South Dakota House Bill 355, New York House Bill 937, New Hampshire House Bill 453, Wyoming Senate Bill 53, and Connecticut State Bill 61, although differing somewhat in their provisions, all aim to prevent trespassers from stealing rides on railroad cars or locomotives. The Wyoming bill makes conductors in charge of cars or trains special constables with authority to arrest offenders and deliver them to the first available sheriff or deputy sheriff. House Bill 116 passed by the same legislature vests similar powers in enginemen. The New Hampshire and South Dakota bills have provisions similar to those in the Wyoming laws.

Iowa House Bill 381 prohibits the occupation of a car or locomotive by force and without the consent of the persons in charge of it. It likewise makes it unlawful for any one to enter a car or engine with a dangerous weapon for the purpose of committing a public offense. Michigan Senate Bill 261, Connecticut Senate Bill 61 and New York House Bill 937 make it unlawful for unauthorized persons to walk upon or along the railway tracks or right of way except at a public or private crossing. The New York law provides specific penalties, a feature heretofore lacking; and this change will greatly facilitate enforcement.

New Hampshire House Bill 584 provides a maximum penalty of \$5,000 or ten years imprisonment, or both, for any one who injures, destroys or damages railroad property or tampers with a railway switch.

GRADE CROSSING LEGISLATION

Vermont Senate Bill 106 requires steam railways to expend not less than \$75 per mile each year in the removal of grade crossings, specifying that the most dangerous crossings be removed first.

Illinois Senate Bill 409 authorizes the Public Utilities Commission to direct the highway commission to abolish, alter or relocate railway crossings at highways or public roads where such a change is necessary to preserve or promote safety. Wisconsin Senate Bill 572 empowers the Railroad Commission to establish the grade of the tracks of any railroads throughout a county containing a city of the first class in anticipation of a future separation of grades at streets and highway crossings.

Maine House Bill 650 authorizes the Public Utilities Commission to fix the maximum speed at which trains may be run over grade crossings and prohibits the unreasonable or negligent obstruction of such crossings by engines, tenders or cars.

Illinois Senate Bill 409 requires that drivers of self-propelled vehicles reduce speed to a maximum of 10 miles an hour on approaching grade crossings and come to a full stop at crossings where stop signs are posted.

Connecticut Senate Bill 580 directs the Public Utilities Commission to determine what crossings are such that public safety requires self-propelled vehicles to stop and requires that prescribed stop signs be set up at these places. New Hampshire House Bill 68 requires drivers of self-propelled vehicles to reduce their speeds to 10 miles an hour when approaching within 100 feet of highway grade crossing.

Maine Senate Bill 349 authorizes the Public Utilities Commission to require steam railways to install, maintain and operate automatic signals at their own expense at highway crossings where, after notice and hearing, it is determined that signals are necessary to protect public safety. The act defines automatic signals as devices which are audible and visible by day and night and which give warning of the approach of trains.

SMOKE PREVENTION

Minnesota House Bill 395 authorizes cities of not less than 20,000 or over 50,000 inhabitants to enact ordinances with penalties to regulate, prohibit or abate the emission of dense smoke within their limits.

Wisconsin House Bill 359 empowers the Railroad Commission to authorize railways to use electricity in lieu of steam as a motive power or to use both whenever in the opinion of the commission, upon petition and after hearing, a total or partial substitution of electricity for steam will be beneficial to the railroad and to the community or territory served by it.

MARKING VEHICLES CARRYING EXPLOSIVES

Montana Senate Bill 51 and New Jersey House Bill 434 provide that vehicles carrying explosives shall display a red flag bearing the word "danger" on a pole at the front end, or in lieu of the flag the words, "Explosives, Danger," in white letters at least six inches high, printed on or attached to the ends and each side of such vehicles. The bills also prohibit the placing of metal tools or pieces of metal or matches in the body of vehicles containing explosives. The bills do not apply to explosives transported in conformity with regulations of the Interstate Commerce Commission, or

to military or naval forces, nor to explosives carried in small quantities.

CAR SERVICE REGULATION

Kansas Senate Bill 107 requires railways to furnish cars to shippers within a period not exceeding three days for an order of ten cars, not more than six days for between 10 and 30 cars, and not more than ten days for 30 cars or more, after written application has been made to the superintendent, agent or other person in charge of transportation. Cars must be placed at the points indicated in the application and in the order in which the applications are made without preference to any person. In emergencies respecting the transportation of any particular product, the Public Utilities Commission may require that the class of cars needed to handle the commodity be furnished within such a reasonable time as it may prescribe.

North Dakota House Bill 195 requires railways to furnish and distribute cars to elevators in proportion to their daily grain receipts.

Nebraska House Bill 40 authorizes the Railroad Commission, if it finds after a hearing that the supply of cars on a railroad is inadequate, to issue an order prescribing rules for the distribution of cars to divisions and stations of the railroad and to shippers at such stations based upon the relative volume of shipments from each division, station or shipper.

Nebraska House Bill 419 requires railways to transport live stock from the point of receipt to destination at a minimum average speed of 18 miles an hour on main lines and 12 miles an hour on branch lines when trains contain six or more carloads, and at a minimum average speed of 12 miles an hour on main lines and 10 miles an hour on branch lines when trains contain less than six carloads. The computation of speed does not include the necessary time consumed in picking up, setting out, loading or unloading carloads of stock at stations, the time consumed awaiting consolidation with main line trains at junction points—not exceeding two hours at each junction point—not the time consumed in watering and feeding the stock. The law does not apply to the movement of livestock from Omaha for feeding or breeding purposes and permits the carriers, with the consent of the Railway Commission, to designate three days weekly as stock shipping days on branch lines not over 125 miles long.

Minnesota House Bill 40 requires the delivery of livestock to chutes at stockyards to which they are billed within five hours after the arrival at a terminal, provided the stockyards are within a radius of 20 miles. Of this time, switching roads whose principal business is transferring livestock from terminal interchange points to stockyards for unloading, shall be allowed not more than three hours after receipt from the carrier road to deliver the stock to chutes.

Texas House Bill 173 prohibits railways from confiscating or otherwise converting to their own use any carload shipments or substantial portions thereof without the express consent of the owner or consignee. The law does not apply to freight damaged or intermingled with other freight in wrecks, or refused or unclaimed freight.

Florida House Bill 4 makes it unlawful for a carrier which receives a line haul to make any charges for switching a car to or from a loading or unloading point located on its line, sidetracks or spurs. This law applies to intrastate shipments only.

North Dakota Senate Bill 86 requires railways to attach to every stock freight train containing 25 or more cars of livestock a sleeping car sufficient for the accommodation and protection of persons accompanying stock.

Missouri Senate Bill 181 requires railroads to stop all regular passenger trains, whether wholly or partially engaged in intrastate passenger service, at county seat stations

and at junctions where stations are maintained for the reception and discharge of passengers.

Nebraska House Bill 67 relieves railroads from the necessity of operating exclusive passenger trains on lines constructed subsequent to January 1, 1917, until such lines earn to exceed seven per cent per annum according to the formula of the Interstate Commerce Commission.

LAWS AFFECTING LOCOMOTIVES

Arkansas House Bill 191 makes it unlawful for a railway to operate an engine unless so constructed that the engineman and fireman are located under the same roof at all times while firing or operating the engine.

Ohio Senate Bill 5 and New York Senate Bill 199 require railroads to equip locomotives with automatic or foot power control firebox doors.

California House Bill 942 requires that steam locomotives be equipped with automatic bell ringers so constructed that they may be set in motion from either or both sides of the locomotive cab.

GRAIN LEAKAGE

Kansas Senate Bill 249 requires railroads to give written notice to consignors of all leaks or defective cars and also written notice within ten days thereafter, of the time, place and extent of the repairs made while the car was in transit. The act applies only to intrastate shipments of bulk grain.

Montana Senate Bill 33 requires railways to furnish box cars for the transportation of grain or other commodities in bulk, of such construction and in such order that they will not leak. The act also requires railways properly to clean and cooper box cars which have been placed for loading and which are not in such condition as to afford safe transportation to such commodities. If cars are not repaired within 24 hours after written complaint by a shipper to the railroad agent, or if cars are placed at a siding where no railroad representative is located, shippers may have repairs made and recover the cost from the railroad.

SLAUGHTER OF LIVESTOCK ON RIGHT OF WAY

Nevada House Bill 150 and New Mexico House Bill 18 require railways to pay owners the fair market value of livestock killed or injured by trains in case the accident is due to the failure of the railway to construct fences on each side of its right of way.

Nevada House Bill 251 requires railways to provide cattle guards at public highway crossings and to pay the owner of livestock the full market value of animals killed and injured because of the lack of such protection.

MOVEMENT OF BUILDINGS ACROSS RAILROAD TRACKS

Oklahoma House Bill 325 and Missouri Senate Bill 387 require railroads to furnish competent workmen when the movement of a building over a railroad track outside the limits of a city of the first, second or third class makes it necessary to cut, remove, raise or interfere with telephone, telegraph or electric wires or poles. The Oklahoma bill provides that the railway shall be reimbursed for such expense but the Missouri bill stipulates that the expense shall be borne by the carrier.

MISCELLANEOUS

Vermont House Bill 148 prescribes a fine of \$5 for any passenger on a common carrier who publicly drinks intoxicating liquors as a beverage. Connecticut Senate Bill 522 provides a maximum fine of \$1,000 or a maximum imprisonment of 10 years, or both, for any railroad employee who, in consequence of intoxication or any gross or wilful conduct or negligence, causes loss of lives or the breaking of a limb.

West Virginia House Bill 82 requires railways to provide suitable space for the transportation of sick and injured passengers traveling on cots or stretchers and provides that

no charge shall be made for such services other than the regular first-class fare.

Oregon House Bill 549 permits the collection or deduction by employers of reasonable amounts from wages of employees for medical, surgical or hospital care.

Oklahoma House Bill 490 prohibits the removal of railway shops or division points which have been located at a point in the state for a period of five years or more, without the permission of the corporation commission. If the commission finds that the sanitary or habitable conditions at the proposed new location would endanger or injuriously affect the health of employees or their families, it shall refuse permission to make such removal.

Kansas House Bill 770 prescribes specifications to which new caboose or way cars must conform.

RAILWAY REGIMENTS' TOBACCO FUND

The committee having in charge the work of raising among the railway supply companies of the United States a Railway Regiments' Tobacco Fund for the railway regiments that have been organized in this country has begun sending out circulars on this subject to railway supply companies and already a considerable number of subscriptions to the fund has been received. The subscribers up to noon on October 23 and the amounts of their subscription were as follows:

Ajax Forge Company, Chicago, Ill.....(to cover 15 months)	\$150
American Manganese Steel Co., Chicago Heights, Ill.....	10 a month
American Steel Foundries, Chicago.....	"
Buda Company, The, Chicago.....(to cover 3 months)	30
Brace Metal Co., New York, N. Y.....	10 a month
Bucyrus Co., South Milwaukee, Wis.....	"
Economy Devices Co., New York, N. Y.....	"
Camel Co., Chicago, Ill.....	"
Haskell & Barker Car Co., Chicago, Ill.....	"
MacRae's Blue Book, Chicago.....	"
Madden Co., Chicago, Ill.....	"
More-Jones Brass & Metal Co., St. Louis, Mo.....	"
P. & M. Co., Chicago, Ill.....	"
Poole Brothers, Chicago.....	"
Prendergast Co., Marion, Ohio.....	"
Pyle-National Co., Chicago, Ill.....	"
Railroad Supply Co., Chicago, Ill.....	"
Railway Age Gazette, New York, N. Y.....	"
Railway Review, Chicago, Ill.....	"
Ryan Car Co., Chicago, Ill.....	"
Safety Car Lighting & Lighting Co., New York, N. Y.....	"
Sargent Co., Chicago, Ill.....	"
Sherburne & Co., Boston, Mass.....	"
Standard Compler Co., New York, N. Y.....	"
Standard Foreigners Co., Chicago, Ill.....	"
Standard Steel Car Co., Chicago, Ill.....	"

The circulars asking for subscriptions and explaining their purpose only recently have been sent out and it is confidently expected that subscriptions will from now on flow in rapidly from railway supply concerns throughout the country. The amount being asked from each concern is only \$10 a month, which is a small matter in itself but if as many subscriptions are received as ought to be the aggregate amount raised will be sufficiently large to provide a large part, if not all, of the "smokes" required to make the members of the railway regiments happy. As previously explained in these columns, the fund is being raised solely to purchase tobacco for members of the railway regiments which, as is well known, are composed almost entirely of former railway officers and employees.

It is a significant fact that the railways of the United States were the first industry to organize themselves to help the government win the war. It is perhaps no less significant that the members of the railway regiments are the first American soldiers to be actually under fire in the zone of hostilities in France. The work of these men is to operate military railways directly "behind the front," and while they do not themselves fight they are exposed to all the dangers of soldiers and are rendering a service which is as indispensable to the carrying on of the war as the men who will actually go into the trenches. Therefore, from every point of view they are the object of peculiar interest to the railway supply concerns of the country and it is hoped that a generous

fund can be raised for them. "Now is the time to subscribe!"

ELECTRIC ARC WELDING *

By E. Wanamaker,

Electrical Engineer, Rock Island Lines.

The ability of the railroads to meet the demands upon their transportation facilities will be an important factor in the time required for the nation to become effective on the battle fronts. This discussion deals with one way of getting more transportation service out of the railway equipment in existence at the present time. Efforts spent in this direction are as patriotic and necessary as can be imagined. The patriotism of the civilians, particularly of the mechanical engineers in railway service, must not stop with the more or less superficial demonstration of loyalty to the Stars and Stripes. Those of us who cannot go to the fighting front must use the best of our abilities to get service, "and still more service," to paraphrase Lloyd George's quotation, from the motive power and rolling stock of the nation's railway systems.

The growing possibilities of the welding processes in motive power and rolling stock maintenance have been a source of amazement to every railway man who has come in contact with the practice. In cutting operations the application of the oxygen cutting processes saved from 50 per cent to 90 per cent of the time required to perform the operation. Yet in many locomotive shops and car yards the old practices are still followed and man power for this cause has not produced the maximum result.

There was a time when worn surfaces of the steel parts in a machine made it necessary to scrap those parts. It was only with the introduction of the autogenous welding processes that it became possible to stop this economic waste.

The repair of broken members of a machine has been another important work of the autogenous welding processes. Prior to their introduction certain steel parts could be welded in the forge fire, but the range of the work was limited and in many cases its cost was equal to the cost of a new part. Now, however, with the exception of cast iron parts, the failure of which would bring death and destruction, practically all parts of a machine which break may safely be repaired.

It is my purpose to point out so far as is possible how far these new practices may be utilized on steam railways to enable the railway systems of the country to meet the present emergency in the matter of service demanded from motive power and rolling stock equipment. The first of the new welding processes, which may properly be called autogenous processes, since the welding takes place more or less automatically, was the thermit welding process. This process found a wide application in the repair of broken steel parts on the railroads and the saving which resulted from its use without doubt aggregated millions of dollars.

Welding with the oxygen and fuel gas flame was the first widely used autogenous welding process. Since everyone is more or less familiar with the gas welding process, this paper will deal primarily with the electric welding process and an extended discussion of the gas process will be omitted. It is sufficient to state that at present the essential difference is in the method of producing the heat for welding, rather than in the fundamental principles involved.

TWO KINDS OF ARC WELDING

There are two kinds of electric arc welding, known respectively as carbon electrode welding and metal electrode welding. In the former an arc is drawn between a carbon electrode and the piece to be welded and the metal to be added is fed into the arc in the form of a "melt bar." This process is not used extensively in railway work, due to the fact that

* Abstract of a paper read before the Western Railway Club.

welding may only be done in the horizontal plane in this manner and that the work is in general inferior to that which is possible with the metal electrode process.

The metal electrode process uses, as the name implies, a metal electrode,—the arc being drawn between the electrode and the piece being welded. The heat of the arc melts the metal of the piece and the metal of the electrode simultaneously. As the metal of the electrode melts it is drawn across the arc to the molten metal of the piece where a complete and homogeneous union is formed, which we call an autogenous weld. I say the metal of the electrode is *drawn* across the arc rather than that it falls through the arc advisedly, since it will flow straight overhead as well as straight downward. The temperature of the arc is extremely high at its center, actually vaporizing the metal to form the visible arc. With the exception of work with certain electrodes (manganese steel and slag-covered electrodes), the electrode is always made the cathode or negative—that is, the current of electricity flows from the piece being welded to the metal electrode. The reason for this practice is that the greatest amount of heat in an electric arc is liberated at the point at which the current passes from the solid medium to the heated vapor of the arc. Since the metal of the piece has more mass and conducts the heat away from the point at which the welding is being done more rapidly than the electrode, it is desirable to have the greatest amount of heat on the piece. Due to the composition of the manganese and slag-coated electrodes, it is necessary to make these electrodes the positive.

The voltage across the arc required for metal electrode welding is approximately 20 volts and direct current power is necessary. The various types of welding equipment are merely different plans for rendering available a rather heavy current at this voltage, and the power economy of the several systems for obtaining this result varies over a wide range.

WELDING ORGANIZATION

The successful application of the process requires the combination of three factors—engineering knowledge, craftsman's skill and enthusiasm. The direction of the practice on our road rests with the engineering staff of the mechanical department; the actual operation is done by skilled members of the boilermakers', pipefitters', machinists' and blacksmiths' crafts. We do not employ novices or apprentices in this work. Only the best men of the respective crafts are picked for operators. It has been plain from the start that only the highest type of craftsmen could secure the results we want and we have witnessed the growth of a considerable amount of pride and enthusiasm in the work among our operators. Even with the best of equipment and facilities for welding, we recognize the fact that it is absolutely necessary that only skilled operators be employed.

Under competent direction, the skilled and enthusiastic operator will seldom make serious blunders in the application of the process. I am quite certain some roads have had great difficulties in this line among operators made of green apprentices and "handy men." Further, we have found that the skilled craftsman, who is enthusiastic about the process, is continually finding new and profitable fields for its application.

The connecting link between the engineering staff and the operators is the supervisor of welding, who is fully informed on the range of approved applications and is also the most expert operator on the road. He is continually traveling between the shops keeping the practice of each up to date and seeing that everything runs smoothly. The operators at local points are under the supervision of the foremen in exactly the same manner as lathe operators or other craftsmen.

STANDARD INSTRUCTIONS

It was found essential that we compile a complete set of welding instructions, which comprise some thirty typewritten pages. It is the purpose of this set of instructions to

standardize the major operations as far as possible. The extreme range of the application of the process has made it quite impossible, up to the present time, to standardize every single operation, but these instructions cover the field in such a general way that the operator is prevented from making serious welding blunders.

RESULTS ON ROCK ISLAND

The actual results of the operation of the welding equipment and the welding system on the Rock Island Lines have proven interesting. We have recently undertaken a rather extensive investigation of what the results are, and I am giving below some of the figures we have obtained as a result of about six months' operation of the complete system. The real answer to the question of whether or not the expenditure of some \$40,000 for the installation of the system was justified lies in the actual facts—reduction of maintenance cost and actual gain in engine days with our present equipment. Tables I, II and III show some actual figures on the cost of repairing a small number of representative locomotive and other parts (for which we were able to obtain costs at a reasonable expenditure) by the gas and electric method, as compared with the old method which in many cases involved a complete replacement of the part. As compared with the old method, the saving of the electric process arises principally in the saving in labor. As compared with the gas process, the electric welding offers a saving in cost of producing heat and an appreciable saving in labor.

TABLE I.—COMPARISON OF ELECTRIC WELDING VS. OLD METHODS AND GAS

Description of parts	WELDING		Saving over old method	Saving over gas	No. engs.
	Cost old method	Cost gas welding			
Valve stems	\$16.28	\$15.26	\$4.76	\$11.52	10.50
Eccentric straps	17.95	7.63	2.38	15.57	5.25
Cylinder cocks	1.36	1.04	.34	1.02	.70
Cross heads	356.40	120.23	37.73	318.67	82.50
Piston heads	47.93	32.74	10.24	37.69	22.50
Motion saddles	8.32	10.94	3.44	4.88	7.50
Frame braces	99.50	48.60	15.00	84.50	33.00
Crank arms	18.81	26.14	8.14	10.67	18.00
Rocker box castings	4.59	7.29	2.04	2.55	5.35
Transmission bar	2.80	4.38	1.38	1.42	3.00
Reach rod	1.25	1.09	.34	.91	.75
Rocker arms	20.75	13.24	4.24	16.51	9.00
Eng. truck equalizers	7.70	17.24	5.24	2.46	12.00
Truck frame	15.70	13.04	4.04	11.66	9.00
Trailer jaws	2.76	4.38	1.36	1.40	3.02
Extension piston cross head	6.30	4.36	1.36	4.94	3.00
Brake beams	1.69	2.18	.68	1.01	1.50
Brake bangers	5.10	7.45	3.40	1.70	4.05
Smoke arch hance	3.50	6.36	2.46	4.11	1.50
Air pump valves	2.50	1.33	.53	1.97	.80
Lugs on valve yoke	32.45	21.80	6.80	25.65	15.00
Push car wheels	6.00	10.56	3.05	2.94	7.50
Silicon wrench	1.60	1.09	.34	1.26	.75
Drill chuck	15.90	2.18	.68	14.32	1.50
Driver brake fulcrum	5.52	8.72	2.72	2.80	6.00
Wheel spokes	1,276.80	113.08	35.08	1,241.72	78.00
Main rod blocks	15.88	28.34	6.84	7.04	19.50
Triple valve gauge	20.00	3.27	1.02	18.98	2.25
Link blocks	72.24	51.49	15.49	56.73	36.00
Lift shafts	23.98	4.02	1.02	22.96	3.00
Quadrant	7.43	11.09	3.59	3.84	7.50
Wedges	55.04	69.69	21.69	58.53	48.00
Chafing castings	8.30	10.70	3.20	5.10	7.50
Plugging and building up holes	349.69	280.94	140.47	209.22	140.47
Tire rim keys	3.22	5.38	2.38	1.84	3.00
Throttle stem	1.50	1.09	.34	1.16	.75
Reverse lever support	3.38	4.36	1.36	2.02	3.00
Smoke box	61.38	32.43	9.93	51.45	23.50
12th line	12.51	11.40	4.00	9.06	12.50
Strip on cross heads	25.37	31.00	12.66	12.66	18.34
Fire door handle	1.75	1.09	.34	1.41	.75
Boiler casings	63.21	30.30	9.32	53.89	20.92
Frame buckle	4.90	2.41	.91	3.99	1.50
Trailer yokes	5.25	6.45	1.95	3.30	4.50
Motion frame	9.10	10.17	4.17	4.93	6.00
Combination lever	1.03	1.75	.55	.48	1.20
Lugs on trailer hub	4.52	8.52	2.98	2.60	9.00
Center castings	76.81	28.56	9.06	67.75	19.50
Spring blocks	1.15	1.09	.34	.81	.75
Guide blocks	5.52	4.29	1.29	4.23	3.00
Binder	5.19	13.10	4.00	1.40	9.00
Steam pipe	1.12	1.12	1.12	1.67	3.00
Flat spots on tires	99.86	95.77	20.77	70.09	66.00
Building bushings	35.65	9.40	3.40	32.25	6.00
Drilling on side rods	93.48	81.16	31.16	62.32	50.00
Grease cups	11.79	3.43	3.86	7.86	2.50
Stationary fire door	8.90	8.72	2.22	5.28	6.00
Cracks in tanks	372.69	113.62	35.16	337.53	78.46
Petticoat spars	140.52	52.37	16.37	124.15	36.00
Filling worn spars	2,672.80	1,000.60	339.60	2,338.20	735.00
Bins	70.66	87.73	27.23	43.43	60.00
Reverse lever parts	103.02	74.04	23.04	79.98	51.00
Totals	\$6,434.10	\$2,755.74	\$921.61	\$5,512.49	\$1,834.13

TABLE II.—COMPARISON OF ELECTRIC WELDING VS. OTHER METHODS

Description of parts	Cost of other methods	Cost of elec. weld	Saving	No. engs.
Pedestals	\$645.00	\$45.24	\$599.76	5
Tank frames	0.03	1.36	7.67	1
Shop tools	24.36	3.40	30.96	4
Sharp flange drivers	78.64	16.37	62.27	10
Truck side	165.40	20.28	145.12	3
Building up dr. axles	194.00	10.20	183.80	4
Piston rods	121.50	4.90	116.60	1
Building up car axles	11.34	1.71	9.63	1
Bushing staybolt holes	315.00	25.24	289.76	22
Welding flanges	294.96	73.74	221.22	56
Frames	2,607.65	521.53	2,086.12	102
Cracks in fire boxes	931.00	133.28	797.72	11
Totals	2,431.27	297.17	2,134.10	92
Totals	\$7,839.15	\$1,154.42	\$6,684.73	

TABLE III.—SUMMARY—COSTS AND SAVINGS PER MONTH

Cost of other methods	Cost of gas welds	Cost of electric welds	Saving over other methods	Saving over gas weld
\$6,434.10	\$2,755.74	\$921.61	\$5,512.49	\$1,834.13
7,839.15	3,697.42*	1,154.42	6,684.73	2,543.00*
\$14,373.25	\$6,453.16	\$2,075.03	\$12,197.22	\$4,377.13
COSTS AND SAVINGS—PER YEAR				
\$77,209.20	\$33,068.84	\$11,059.32	\$66,149.88	\$22,009.56
94,069.80	44,369.04*	13,853.04	80,216.76	30,516.00*
\$171,279.00	\$77,437.88	\$24,912.36	\$146,366.64	\$52,525.56

* Figures show cost of gas weld if work could have been welded with gas.

Our figures show that the saving effected by the electric arc welding system is being made at the rate of approximately \$200,000 a year with our present equipment. This figure includes a direct saving as compared with other methods of about \$136,000. The saving arising from the fact that we keep the engines in service a greater proportion of the time makes up the balance of the figure. Our figures show that this saving is being made at the rate of about 1,400 engine days per year.

Another way of looking at the same matter is that by the operation of the electric welding system we have obtained the service of four additional engines, without the additional investment, beyond that required to install the welding system. Four additional engines are worth approximately \$200,000. The welding system installed complete cost about \$40,000. The cost of operation of the system for a year is approximately \$34,000. Figuring the value of the engines at \$40 per day, we will pay for the operation of the whole electric welding system and will clear \$22,000 from this feature alone of the operation of the electric welding system. However, we made important savings, as are shown in the preceding table, in the repair of parts on engines, where we could not show an actual gain in engine days of service, and this saving amounts to more than twice the saving arising in the increase of the number of engine days of service we get from our equipment. The net return secured on the electric welder investment amounts to approximately 500 per cent per annum. The net cost of the installation and equipment per unit under present conditions is approximately \$1,300. The foregoing figures show rather conclusively that the installation of the electric welding system has been a profitable investment on the Rock Island Lines.

AMOUNT OF EQUIPMENT REQUIRED

In spite of the fact that we have probably a larger number of operators than any of the Western roads, we believe that we are far from fully equipped. The field of application of the process is continually widening. We are not able at present to handle all the operations which we have demonstrated to be practical and profitable. There is a totally unexplored field in maintenance of freight and passenger cars, which promises to eclipse in importance maintenance of motive power. There is a field in the repair of special track work, which we have not gone into up to the present.

POSSIBLE NEW APPLICATIONS

Within the last three years the arc welding process has been greatly improved and developed, both in the equipment for making the weld and in the welding material. It has, in fact, been developed to such a state that it will no doubt cause

changes in many forms of construction, and the welding of fireboxes, tanks, etc., will become an economical practice. In the field of car construction and maintenance we may look for a wonderful development. For instance, today the cast steel truck side frame will last almost indefinitely where the electric welder is used in maintenance. By the intelligent application of spot welding with the electric arc, it will, no doubt, be possible to tie down bolts and nuts in the various parts of the rolling stock and motive power in such manner as to prevent their working loose, with the attendant very large saving in maintenance and operating expense. Quite recently we have been able, by using what is called a slag-coated electrode, to deposit steel having a carbon content of 50 per cent, which will enable us to do some work which we have been unable to do heretofore. We can successfully take care of the worn or damaged flanges of driving wheels, and should be able to reclaim much of the special work and rail steel by successfully building up the worn parts or broken sections.

ARC VS. GAS WELDING

It has been our purpose in establishing the practice in the welding field to look the facts squarely in the face and apply either the gas or electric process, depending on which shows the best results at the lowest price. At the present time we are of the opinion that the electric process will supersede the gas process on all steel welding and some of the rough steel cutting. In the cutting of boiler steel and all close cutting, however, and the welding of cast iron and the non-ferrous metals, the gas process has unequaled advantage. We are operating 75 gas torches and one acetylene generating plant on the same general principle as obtains in the case of the electric arc welding equipment. It is also best to use gas welders at all points where only occasional welding is done and which would not justify the investment necessary for the installation of an electric welder.

It is our belief that with approximately five times the amount of electric welding capacity we have at present, we can show at least five times the annual net saving, which would amount to a million dollars a year, and that we can with this equipment in operation show a saving of around 7,000 engine days per year, which means that we would be able to secure from our present engines a mileage that will equal that which could otherwise only be secured by the purchase of 23 additional locomotives.

DISCUSSION

While many roads reported large savings by the use of oxy-acetylene welding, only a few had installed the arc welding process. The field for electric welding is even wider than for gas welding. Contrary to the opinion generally held, cast iron can be welded by the electric process with success. In judging the efficiency of welding, consideration should be given to the elasticity of the metal in the weld as well as the tensile strength. Welding can be done with thermit where other processes prove unsuccessful; for instance, the welding of main and side rods with thermit was practiced with entire success up to the time when the locomotive inspection law, forbidding autogenous welding of such parts, went into effect.

AUSTRALIAN LINES ADOPT SUPERHEATERS.—In giving evidence before T. R. Johnson, who recently investigated the operation of the Victorian Government Railways, W. M. Shannon, the chief mechanical engineer, said that the adoption of superheaters should save 12½ per cent of the fuel consumption, and had 200 of the locomotives on the Victorian railways been equipped with superheaters there would have been a saving last year, when coal was 15s. 10d. (\$18.80) per ton, of £11,378 (\$55,300). At present coal was 21s. 1d. (\$5.06) per ton, and, therefore, there would have been a saving of £17,000 (\$82,620).

WASHINGTON CORRESPONDENCE

WASHINGTON, D. C., October 23, 1917.

RATE CASE TO BE REOPENED

The Interstate Commerce Commission, which has sometimes been accused of too great deliberation in acting on railroads' requests for increased rates, sprung a complete surprise on the railroads on Monday by showing a burst of war-time speed and announcing the reopening of the 15 per cent advance rate case, so far as the carriers in the eastern district are concerned, at a hearing on November 5 in Washington. The commission said that if the carriers' suggestion is well grounded that further financial relief is needed, it is obvious that such relief should be had promptly in order that transportation demands in time of war may be fully met. Coming within a week after the traffic executives of the eastern roads had appeared before the commission on October 17 to discuss a new proceeding for increased rates, in which the roads announced that it would take them 60 days to prepare their application, the announcement of the commission was a complete surprise. In fact, it is believed to represent the first case on record, at least of such importance, in which the commission has expressed a willingness to proceed more speedily than even the carriers had suggested, although it had set a new precedent by the expeditious way in which it handled the original 15 per cent case.

Although a suggestion that the matter be handled as a reopening of the 15 per cent case was made at the conference on October 17, George Stuart Patterson and the other representatives of the eastern carriers seemed to think that method out of the question and said that they would prefer to wind up the proceedings in the 15 per cent case and begin an entirely new proceeding with a view of securing the advances which were not allowed in that case. The reasons given were that the original case had become involved in a technical snarl as many of the proposed advances had not been cancelled as expected and were due to be resuspended on October 28, and as to many of the more important commodities involved, the carriers had filed new tariffs which had been suspended and set down for hearings in separate cases. These included the proposed increases on grain and grain products, live stock and fresh meats and petroleum and its products. Last week's conference was concluded with the understanding that George F. Randolph, commissioner for the lines in Official Classification territory would send the commission a formal letter stating the carriers' proposals concretely and that the commission would then give its answer. Without waiting for such a letter, the commission addressed to Mr. Patterson on October 22 and gave out to the press during the evening a letter by Secretary McGinty, saying that he was instructed by the commission to advise that after conference the commission is of the opinion that the carriers in the eastern district represented at the informal conference held on October 17 "are in error in suggesting what is virtually and for most practical purposes a continuance for at least 60 days of the 15 per cent case."

"The 15 per cent case is still open," the letter declared, "and before the commission. If your suggestion is well grounded that further financial relief is needed by the carriers. It is obvious that such relief should be had promptly in order that transportation demands in time of war may be fully met."

The letter continued:

"In its report of June 27 the commission referred at some length to war conditions. The commission reached the conclusion that only part of the requested increase should be then awarded, stating that the things which the carriers believed would happen have not happened. But the commission added, p. 325:

None of us know what the future may develop, . . . if it shall develop that the fears which have prompted the carriers are realized, or that their realization is imminent, we shall be ready to meet that situation by such modification or amplification of the conclusions and orders herein reached and entered, as are shown to be justified.

"The gist of your suggestion of October 17 is that the situation above referred to has now arisen; it is suggested that operating revenues do not now adequately overcome mounting costs. If this be so, the commission's stated purpose of meeting that situation will not have been attained by adopting your suggestion of a hearing 60 or 90 days hence. The commission is emphatically of the opinion that the evidence necessary to establish the full truth should be presented, without delay, in order that the carriers may be maintained in a position to do their full war duty.

"The record submitted in June indicated that the condition of the carriers in New England was less favorable than in any other section of the country. The commission is impressed with the desirability of being promptly advised as to their present situation, particularly as regards their ability to meet the increased cost of railway fuel.

"Since the outbreak of the war carriers and shippers alike have with praiseworthy alacrity co-operated to improve the efficiency of our transportation system. The results have been marked; but there is room for still further elimination of waste and increase of efficiency. On the other hand, there have been many misleading statements and publications with respect to the financial condition of the carriers, particularly in the eastern district. The exact situation should, in our opinion, be at once disclosed before the commission and to the public.

"The commission will therefore set down for further hearing the *Fifteen Per Cent Case*, so far as carriers in the eastern district are concerned, on November 5 at 10 o'clock in Washington, D. C.

"Other parties to this proceeding are being advised accordingly."

The commission on Tuesday issued an order further suspending until April 28, 1918, such rate schedules filed in connection with the 15 per cent case, as the roads were expected to cancel as a result of the decision in that case but which they had failed to cancel. The order applies only to those which shall not have been canceled on or before October 27.

TRANSPORTATION CO-OPERATION

The co-operative method of settling various transportation problems, which is prevailing to such an unusual extent in Washington nowadays, is well illustrated by the plan which was followed in the case of the order issued by the Fuel Administration prescribing a plan for apportioning a certain proportion of the coal mined on the Pennsylvania for its use for railroad fuel, and the similar order which has been issued for the Baltimore & Ohio. Although the order was that of the Fuel Administration it was actually drawn up by and represented the composite experience and knowledge of representatives also of the Interstate Commerce Commission, the Car Service Commission of the Railroads' War Board, the director of priority of transportation and the coal operators; and it also had behind it the authority of the various governmental agencies who participated.

There has been much discussion about the great centralization of arbitrary authority at Washington since the war began and some fears have been expressed that some of the agencies upon whom great power has been conferred would exercise it without taking all necessary conditions into consideration. Judge Lovett was given very broad authority under the priority of shipments act, which some people thought ought to have been conferred upon the Interstate Commerce Commission. The commission was given very broad powers over the distribution of freight cars under the Esch-Pomerene bill, which many thought would restrict the

operations of the Commission on Car Service, which itself was having rather a free hand; and the food and fuel administrations under the Lever law were given almost unlimited authority in certain directions. But, as the working plans of these various bodies have been worked out a plan has been developed, at least so far as transportation matters are concerned, by which none of these bodies has sought to act entirely by itself but an informal co-ordinating committee has been formed by which each makes use of the machinery, experience or knowledge of the other organizations; and experienced transportation men are attached to all of them.

The Interstate Commerce Commission has not issued any orders under the car service law, but it has placed at the head of its Division of Car Service a practical railroad man, E. H. De Groot, Jr., and one of its own ablest examiners, A. G. Guthrie, who has had a considerable experience in car service matters, and these men sit in the meetings of the Commission on Car Service and co-operate with it in various ways. Instead of developing a duplicate organization of its own the commission makes use of the machinery of the railroad organization, and as a result most of the directions of the railroad committee carry the support of the commission's authority. Where transportation of food is concerned Edward Chambers, head of the transportation division of the Food Administration, takes part in the work, and in connection with coal transportation, F. C. Baird, who is connected with the Fuel Administration, is called in. G. W. Kirtley, assistant to Judge Lovett, represents the authority conferred by the priority of shipments law.

There has been some confusion caused by the number of agencies which are engaged in trying to find cars for the hauling of important shipments of various kinds, but in fact most of the requests, no matter to whom addressed, shortly find their way by one channel or another to the Commission on Car Service, which knows where the cars are and how to get them moved.

As a result of this plan of co-operation action may be guided by more information than if each organization acted independently. Numerous appeals for priority orders are made based on fears for the future rather than on actual need. For example, the mayor of a large city recently wired a United States Senator stating that the street railway company in his city had only a three days' supply of coal on hand and urging that the senator arrange for a priority order. The company also appealed to the Commission on Car Service, which had its sub-committee in the city referred to investigate the situation. An actual check showed an 8-day supply of coal at each of two plants and 10 days' supply at each of three others and 60 cars of coal in transit, equal to six days' additional supply.

COAL PRODUCTION AND DISTRIBUTION

The United States Geological Survey in its weekly report on coal production shows a slight increase in bituminous production during the week ending October 13, amounting to .7 per cent over the week of October 6. The total output, including lignite and coal coked, is estimated at 10,702,701 net tons. The average production per working day was 1,783,783 net tons, an amount but little in excess of the daily production at this season last year. Anthracite shipments increased from 42,362 cars to 42,824 cars. The principal factor limiting production, according to the statement, continues to be the shortage of cars. In the week ending October 6 losses from this cause, while smaller by about 2 per cent than during the preceding week, were 10.4 per cent of the full time capacity. The car situation improved noticeably in Indiana and to a lesser degree in Ohio, in both of which states losses from this cause have been severe. Little change was reported in Pennsylvania and West Virginia. The ratio of tonnage produced to full time

capacity with the labor forces at present available was 71.9 per cent for all mines reporting. A decline in the index for Illinois attributed to labor troubles offset the improvement registered by Indiana and Ohio.

The Fuel Administration is giving immediate consideration to the problem of distribution of coal. The program as announced is briefly as follows:

"1. To provide an adequate and regular supply of fuel to the railroads, which is indicated by the order issued in connection with fuel supply of the Pennsylvania Railroad, which has been extended to include the Baltimore & Ohio, and will shortly be applied to other roads, as obviously the railroads cannot be expected to move the enormous amount of freights which they must handle, unless they are provided with sufficient fuel with which to do so, and it is in the interest of the conservation of equipment that this supply be obtained regularly from mines in close proximity to where the coal must be used. This will avoid the necessity as is now the practice, of holding several thousand cars of coal under load, for fuel purposes. It will also eliminate the necessity of transporting coal from one district to another, which will result in a saving of both cars and motive power, of which the railroads are short. It will further avoid confiscation of coal, which has been necessary in some instances in order to provide the railroads with sufficient fuel.

"2. When the adequate and regular supply of fuel had been accomplished, we expect to issue a rule confining coal cars to the coal trade, with such exceptions as are proven necessary, and to compel the return of empty coal cars to the originating line.

"3. The matter of preference in movement of coal cars, both loaded and empty, over other slow freight is receiving consideration, and it will undoubtedly be necessary to issue a rule at an early date, that preference be given to food and fuel. The situation today is the railroads are congested, and are unable to move to the market the coal which is offered them for transportation. This is due to the enormous amount of freight which they are called on to handle. We believe the program thus briefly outlined, when put into effect, will result in an increased car supply to the mine, and will accomplish an increased production sufficient for necessary requirement."

The Fuel Administration will announce within a few days its regulations limiting coal exports to Canada. Control of shipments will be exercised through the issuance by the Fuel Administration of special permits to shippers, who will be allowed to forward cargoes up to the amounts prescribed by the Fuel Administration without obtaining special export licenses. The plan is to hold Canada, during the rest of the year, to supplies not exceeding 10 per cent more coal than was received last year. This arrangement is based on a 10 per cent increase in production in the United States this year and permits the Dominion to share equally with the states of the union. Permits for shipment will be granted only to shippers who sent coal to Canada last year.

INCREASED RATE PROCEDURE

The Interstate Commerce Commission up to October 22 had issued 44 fifteenth section orders, giving approval, without formal hearing, of the filing of tariffs containing increased rates. Over 1,100 such applications have been made by the railroads, but pending the determination of the procedure to be followed the commission has issued approval orders in cases of minor importance, a majority of which are for the purpose of correcting errors in tariffs on file. Order No. 41 approves the filing on five days' notice of tariffs of the Pennsylvania and the Buffalo & Susquehanna increasing rates on iron and steel articles between certain points in Trunk Line territory to make them the same as

rates in effect via other routes. The commission is expected soon to issue its general order establishing the procedure under the fifteenth section as amended, there having been practically no opposition to its tentative order at the hearing last week.

ECONOMIC VALUE TO GOVERN SELECTIVE DRAFT

Provost Marshal General Crowder has announced a change in the machinery of the selective draft by which railroad employees and other men required for important industries need not be called for military service until after others whose economic value in their present occupations is considered of less importance.

For this purpose a series of questions will be addressed to those registered from which information will be obtained to enable the local boards to divide the men into five classes, based on the status as to dependents and the occupation. These classifications will determine the order in which men will be drawn for service and the physical examination will not be made except for the men who are called.

Skilled industrial and agricultural laborers are placed in class 2.

MASTER PAINTERS' CONVENTION

The proceedings of the first day of the Maintenance of Way Master Painters' Convention, which was held at the Hollenden Hotel, Cleveland, October 16 to 18 inclusive, were reported in last week's issue. On Wednesday, Bert E. Darrow, master painter, Atchison, Topeka & Santa Fe, Kansas City, Mo., presented the report of the committee on "Painting of Water Tanks." This was devoted largely to an outline of safe practices in the use of scaffolds, ladders, lines, etc., employed to gain access to the sides of the tub. The discussion of this report brought out interesting information concerning the practices on various roads.

W. S. Lacher, associate engineering editor, *Railway Age Gazette*, Chicago, spoke on the lack of reliable information concerning the amount of painting done by the railroads, particularly in the maintenance of way department, and that in consequence little information was at hand concerning the importance of the work done under the direction of the maintenance of way master painters. He presented some figures indicating the approximate amount of paint used by the railroads in maintenance work, and urged the gathering of more accurate data from which more reliable conclusions could be drawn. Following a discussion of this matter, the president was authorized to appoint a committee to investigate the subject.

An interesting discussion was held on the practice of painting lines along station platforms to indicate the safe limit for passengers to stand when trains are entering the station. The question arose as to the most suitable color, and after some discussion the convention adopted a resolution recommending the painting of a white line on all station platforms as a measure of safety to the public.

On Thursday morning, H. S. Bird, master painter, Philadelphia & Reading, Philadelphia, Pa., presented a committee report on the painting of bridges, which covered the materials and workmanship, and special measures to secure economy and insure the safety of the men employed. H. B. Wilson, master painter of the Bessemer & Lake Erie, Greenville, Pa., read a paper on the finishing of floors, and H. F. Jones read a paper on recommended practices for the master painter designed to secure the greatest efficiency and economy in his work, while insuring the safety of the painters and the public as well as other employees of the railroad.

Metal protection was the subject of a paper read by Philip L. Maury, Sherwin-Williams Co., Cleveland, Ohio. This comprised an outline of the requirements of an efficient metal

covering with a discussion of the behavior of various materials in serving this purpose. Special reference was made to the present paint situation, illustrated by the manner in which the paint experts on the Council of National Defense, have recommended modification of government paint specifications with the effect of conserving valuable materials and greatly reducing the cost of the painting.

This was followed by the discussion of questions submitted during the course of the convention by various members, answers being given by members of a committee. W. S. Lacher gave an outline of the principles of the bonus system with special reference to its application to railroad work, particularly track maintenance. H. E. Conrad, master painter, Pennsylvania Railroad, Huntingdon, Pa., stated that the bonus system had recently been applied to track work on the Pennsylvania and that he was now at work on time studies, designed to apply it to painting. Another subject discussed was the protection of steel decks on track scales, in the course of which H. F. Jones stated that he had secured the best results by three coats of red lead, covered with a coat of graphite, the last two coats being sanded. This proved expensive, but gave very good results. The painting of concrete mile posts and other roadway signs was discussed, and the conclusion was reached that there was no difficulty if the concrete was thoroughly cured before the paint was applied. The scarcity of flax seed for the manufacture of linseed oil led to considerable discussion, some members being of the opinion that the industry would adjust itself to the new conditions, while others believed that the situation was serious. Attention was directed to the need of employing great care in the use of any substitute or adulterated oils.

Election of officers resulted in the following selections: President, H. E. Conrad, master painter, Pennsylvania Railroad, Huntingdon, Pa.; first vice-president, H. F. Jones, Cleveland, Cincinnati, Chicago & St. Louis, Wabash, Ind.; second vice-president Ole Stubstad, master painter, Chicago & North Western, Winona, Minn.; secretary-treasurer, F. W. Hager, Ft. Worth & Denver, Ft. Worth, Tex. Chicago was selected as the place for the next meeting, which will be held October 15 to 17, 1918.

The convention was characterized by active interest in all of the discussions and a good attendance at all the sessions. Practically no time was given to social features. Wednesday and Thursday afternoons were occupied largely by visits to the plants of various paint and varnish manufacturers in Cleveland.

BARB BIG PARCELS TO FRANCE.—Christmas and other gifts for American soldiers in France must be restricted to parcels of not more than seven pounds each. The Post Office Department has announced that it had been informed by the American postal authorities in France that, under the arrangements with the French railways, the French postal service is unable to carry in the parcel post packages in excess of seven pounds.

THE CANAL DU NORD.—The Canal du Nord, the greater part of which is now behind our lines, has a double interest for British readers. With our neglected waterways, says a writer in the *Manchester Guardian*, we can hardly imagine a canal so overburdened with traffic that it can carry no more, and yet this was the case before the war with the water route from Paris to the Lille district. It represents the "very latest" in French canal engineering, and is 70 ft. wide and 8 ft. deep, and has 19 locks with an average lift of 20 ft.—more than 5 ft. greater than any ordinary canal lock in England, and 3 ft. 6 in. more than Latchford, the deepest on the Manchester Ship Canal. The canal, when completed, would have cost nearly £3,000,000 (\$14,580,000) and electric towage was to have been adopted.

Carrying the Selected Men to Camp Devens

The Boston & Maine Has Made the Most of Having
All Necessary Railroad Facilities Already at Hand

ABOUT two weeks have now passed since the completion of the movement of the second contingent of 40 per cent to Camp Devens at Ayer, Mass. On October 8 there were at that cantonment about 36,700 men in training for the new National Army, this representing 85 per cent of the total quota that was intended for the camp. The remaining 15 per cent will be called later this month, although there is some possibility that these men, the last contingent, may be sent, instead, directly to join a depot brigade of the National Guard now forming and in training at Westfield and Framingham, Mass.

The army officers who chose the site for Camp Devens apparently succeeded in picking almost the ideal spot in all New England from the standpoint of healthfulness and sanitation for the cantonment that will hold the 76th divi-

always been an important junction point for both passengers and freight so that when the army officers chose that town for the site of the cantonment they found a comparatively large passenger station, a 2,500-car freight yard, a strategically located wye at the station and the junction of the two divisions, engine houses and attendant railroad facilities. The railroad has had to enlarge its freight yard to a capacity of 3,500 cars, to construct a certain amount of additional trackage to serve the ten government store-houses and to meet the contractors' requirements, and also to make some additions to its passenger station and construct two new interlocking plants, but that has been about all. There has had to be no substantial increase in either the forces at the passenger station or in the freight yard, although this does not necessarily mean that the present



The Crowd that Gave Boston's First 40 Per Cent Its Send Off from North Station

sion of our new National Army. Railway men are agreed that although the camp may not be in the geographical center of the district from which the men at the camp have been drawn, it is at the center of population of New England and at the most strategic point of its network of railway lines.

The movement of troops to Camp Devens and the work of transporting material and supplies to that camp have been peculiar in that the Boston & Maine, on the line of which the camp is situated, has had to construct practically no new facilities or to get together any considerable force of men to handle the camp's freight and passenger traffic. Camp Devens is at Ayer, Mass., on the main line of the Fitchburg division of the Boston & Maine, 35 miles out of Boston and at the junction of the Worcester, Nashua & Portland division at a point 28 miles north of Worcester and not quite 20 miles south of Nashua, N. H. Ayer has

force has not had to do much hustling to keep up with the demands made upon it.

The site for Camp Devens covers an area of about 10,000 acres. It lies immediately south of the main line of the Fitchburg division and west of the W. N. & P. division. These two lines cross at right angles directly at Ayer station about one-half mile east of the camp and the freight yard is adjacent to the W. N. & P. division directly south of the station and east of the camp. Railroad operation at some of the other cantonments has been hindered rather than helped by the necessity for using a wye to turn engines and trains. At Ayer, as will be shown below, the wye is the facility that has helped railroad operation almost more than any other one thing.

The men from Camp Devens have been assembled from the New England states and from northern New York state about as follows: Maine, 1,550; New Hampshire,

1,020; Massachusetts, 17,500; Connecticut, 9,330; Rhode Island, 1,530; New York, 5,100. The rapid progress made by the contractors at Camp Devens enabled that cantonment to be one of the few in the whole 16 to receive its quotas of 5, 40 and 40 per cent respectively on schedule time. The railroads in figuring out their schedules for handling these contingents arranged it so that the two movements of 40 per cent would each be spread over five days and this schedule was lived up to exactly. In the first movement of 40 per cent, the various states contributed their men on the following basis: On the first day, September 19, there were received at the cantonment the men from Maine, New Hampshire, Vermont and Rhode Island; on the second day, those from Connecticut; the third day, those from eastern Massachusetts, excluding Boston; on the fourth day, those from northern New York, and on the last day those from western Massachusetts and from Boston.

The illustration shows the crowd which gave the selected men from Boston their send-off from North Station. As it happened, the fifth day when the men from the Boston district left their homes was a Sunday, a great number of people from the Metropolitan district of Boston came to the railroad terminal to give the men a last good-bye with the result that a congestion resulted in the station and in the streets outside such as had not been seen in either the city or the station for many a day. In fact, so great was the congestion that men from a number of the local boards could not get to their trains at all. The trains went out without them, and they followed on a special made up for their special benefit later in the day. This condition was entirely corrected in the movement of the second 40 per cent, the Boston men moving on a Friday instead of on a Sunday. Boston called out one of the largest details of police it had called out for a long time and admittance to the station platform without a ticket would almost have required a permit from the mayor.

When the second movement began on October 3, the railroads carried as before the men from Maine, New Hampshire, Vermont and Rhode Island on the first day, those from Connecticut on the second day and those from Boston and eastern Massachusetts on the third day. On the fourth day, the second contingent of men from New York arrived, and on the last day, Sunday, October 7, the entire troop movement was completed with the arrival of the men from western Massachusetts.

It has been noted that the Boston & Maine was exceedingly fortunate in having all the necessary facilities already on hand. This preparedness, unintentional as it was, has had a more than compensating effect on the ease of operation which has characterized the railroads' work in connection with the movement of troops to Camp Devens.

As was the case at other cantonments, the policy was followed of running cars on regular trains when there were not sufficient cars from a particular region to make up a fair-sized train. In a case where such cars were handled, they were very often brought through over the Fitchburg division in regular trains, and the men left the cars at Ayer station and marched over to their new barracks. New England is so thickly populated, however, that most of the men came through on special trains. As showing how prepared the Boston & Maine was to handle these trains, it is worth while observing how they were received on a typical day. October 4 was the day on which the camp received its second quota of 40 per cent from Connecticut. These trains came through with from 10 to 13 cars and from 350 to 850 men over the New Haven to Worcester. At Worcester they were taken by a Boston & Maine engine and crew and then covered the ground between Worcester and the camp in about 50 minutes. They unloaded their men on one of the tracks on the main line directly at the crossing of one of the roads leading into the camp itself. The train was then run to Ayer station one mile beyond, around the wye, headed out again and the

movement back to Worcester completed without uncoupling a car or turning an engine. In all cases so quickly was this movement handled that the cars were on the Boston & Maine's line from the time they left Worcester until they returned, not more than 2 or 2½ hours. The entire movement of about 4,400 men required seven trains, all of which arrived at Camp Devens between 1:45 and 6:30 p. m. Not a single train was late, and in most cases the trains arrived from one minute to one-half hour ahead of their schedules.

On another day, the Sunday the troops were carried from Boston and western Massachusetts, 11 trains brought in 7,000 men. On the same day, the yard at Ayer handled 1,800 cars in interchange between divisions, and yet with all this traffic only two extra men were required at the freight and passenger stations, one a flagman and one a switchman. Practically every train came through on time, although the schedule for the specials out of Boston was as good as that of the regular trains which run through without a stop. And what was most important, there was not a minute's delay caused to a freight or passenger train.

Trains from points on the New Haven and Boston & Albany were delivered at Worcester, or Concord Junction. Those from Boston were handled similarly to those from Worcester as mentioned above, that is, they unloaded their men at a siding on the Fitchburg division directly beside the camp, about one mile west of Ayer station, then they were backed around the wye, and, if desired, could be headed out towards Boston, where the cars were cleaned and otherwise disposed of.

One of the most interesting features of the entire job of carrying the selected men was the car supply. Many of the men traveling from points on the Boston & Maine came through in solid vestibule trains, while of those from points on the New Haven were furnished with electrically lighted passenger cars considerably better than is supplied on many of the road's suburban runs. The drafted men in most cases respected this kind of treatment. The condition of the cars was checked up by army and railroad officers directly on its arrival, but there were very few cases where they were at all damaged. This does not mean, of course, that the cars were as clean as they might have been at the end of a normal run. But the car cleaners did not find it hard to sweep out even an enormous pile of magazines, newspapers and empty or partly filled lunch boxes.

In few cases did the run to Camp Devens require much over three or four hours. On longer runs lunch boxes were put on the cars for the men at so-called "dining stations." Of course, as at the other camps, a few of the men took advantage of their opportunity before leaving home to get their last drink and a number of them had to be lifted or helped off the train at the camp, but in no case was there serious disorder. In fact, the train crews that were assigned to these trains were enthusiastic and very much interested in the work they were called upon to do.

The passenger movement to Camp Devens will not, of course, end with the movements of the National Army men to the cantonment. Announcement was made about a couple of weeks ago of the change in the army's plans whereby the drafted negroes will be sent to cantonments throughout the country instead of the cantonments in the southern states, and whereby three National Guard and only one National Army divisions will be formed of white men in the south instead of three divisions each as originally planned. This means among other things that the white men now in the National Army at Camps Gordon (Atlanta, Ga.), Camp Jackson (Columbia, S. C.) and Camp Pike (Little Rock, Ark.) will be taken as far as necessary to fill up the 30th (Camp Sevier, S. C.), 31st (Camp Wheeler, Ga.) and 39th (Camp Beauregard, La.) National Guard divisions, and that the surplus will be sent to the Southern's single National Army division to be formed at Camp Jackson, Columbia, S. C.

Camp Pike will then be filled with surplus men from cantonments in the west and the men at Camp Gordon will be replaced with surplus men from Camps Devens, Upton, Dix, Meade and Lee, all in the east. Camp Devens will be called upon to supply about 8,000 men from its present number, and before long steps will have to be taken by the railroads to provide for their transportation.

But what is more important from the railroads' point of view at the present moment is the fact that Camp Devens has apparently become a Mecca for all New England. One would believe that half the soldiers at the camp had visitors on Sundays, and that those having no visitors took the trip into Boston or to other adjacent towns to see their relatives instead. The road is establishing a special service to Lawrence, Lowell and Worcester and has added a number of express trains between Ayer and Boston. There has been some difficulty in handling this special service because on one or two occasions the army officers have not cooperated sufficiently with the railroad officers as to advising them as to how many men would be on leave. But even that is remedied now.

FREIGHT SERVICE

The advantage of having a classification yard at Camp Devens has in one respect been a disadvantage. At other camps the trains of government or contractors' supplies reach the camp in solid train loads, but at Ayer they come through mixed in with other cars and have to be classified. For a period of two months the road was handling in this way from 35 to 80 cars a day. These cars were classified and handed over to the contractor, or the government, and it is on record that the detention of cars at the camp has seldom been over two days; and the greater part of the cars have been unloaded in a matter of about three hours. Up to September 1, the contractor at the camp had finished 622 barracks and 124 other buildings. For this purpose the railroad had handled 30,000,000 feet of lumber, 20 miles of water pipe, 2 miles of sewer pipe, 60 miles of heating pipe from 12 in. diameter down, a tremendous amount of contractor's equipment, and food and incidental supplies for the workmen. The maximum number of men employed by the contractor on any one day was 9,176, on August 22; and the average number was over 5,000. To feed these employees, the contractor's commissary had to receive supplies enough for an average of 17,100 meals daily. From June 26 to September 1 the contractor alone unloaded 3,000 carloads of freight, an average of 50 cars a day. On one day he unloaded 125 cars. The movement of freight to the camp, of course, still continues, but not quite to the same extent as when the cantonment buildings were under construction.

ENGLAND'S SMALLEST PASSENGER RAILWAY.—According to the Nottingham Guardian, the smallest passenger-carrying railway in England is to be found on the estate of S. P. Derbyshire, at Ilkeston. The gage of the roadbed is only 7 in. The engine, a perfect model of the Midland Railway 1,000 class, is $3\frac{3}{4}$ h. p. and will haul four adult passengers on its miniature bogie truck.

NIGERIA'S RAILWAY REVENUE.—A publication called "West Africa" states that despite the war Nigeria provided for ordinary needs and spent nearly £1,750,000 (\$8,575,000) on railways during 1916, besides £250,000 (\$1,225,000) on war, thereby incurring a deficit of £124,000 (\$607,600) up to December 31. This, however, was all cleared off by the end of February this year.

CONSTANTINOPLE TERMINAL DESTROYED BY FIRE.—The Swiss Insurance Company "Helvetia" has received a telegram from Constantinople saying that the new railway station and two immense warehouses have been totally destroyed by fire, the damage done being estimated at over four million francs (£160,000 or \$784,000). The station was built by the Germans as the terminus of the Bagdad Railway.

INSTRUCTIONS FOR APPLYING WAR TAX

The Association of American Railway Accounting Officers, through a sub-committee headed by A. H. Plant, comptroller of the Southern, has issued a circular giving tentative instructions as to the application of the new war tax to the transportation of property and persons.

An informal conference was held by the subcommittee and others with representatives of the internal revenue commissioner. tentative instructions, as drawn by an accounting officer of one of the lines, being used as a base for the conference. The representatives of the internal revenue department stated that the conclusions reached by them with respect to doubtful questions were tentative and that such tentative conclusions would be subject to formal approval by the Secretary of the Treasury but that, while the conclusions reached might not be final in all respects, they could be used, in the absence of further rulings or decisions, as a working basis.

Should individual or specific transactions arise, not covered in the conclusions, accounting or other officers interested should apply to the internal revenue commissioner, Washington, D. C., for rulings.

If the corporate committee of the association so elects, the chairman will arrange, through the secretary of the association, to reissue and distribute to the members of the association all treasury decisions which may be issued in response to queries made.

The tentative instructions, referred to, are in part as follows:

(1) Section 500 of the law provides that transportation companies shall levy, assess, collect and pay to the United States government, certain taxes for the use of facilities rendered by public utilities.

(2) The taxes imposed under section 500 become effective on November 1, 1917.

(3) Section 501 provides that:—"The taxes imposed by section five hundred shall be paid by the person, corporation, partnership, or association paying for the services or facilities rendered."

(4) The taxes imposed under section 500 of the law in which officers, agents, and conductors of these companies are directly and immediately interested, and which these instructions are intended to cover are:

(a) A tax of 3 per cent of amounts paid for the transportation of property by freight. (See paragraph 5.)

(b) A tax of 1 cent for each 20 cents or fraction thereof, paid for transportation of parcels by express.

(c) A tax of 8 per cent of the amount paid for the transportation of persons (see paragraph 7); and a tax of 10 per cent of the amount paid for seats, berths and staterooms in parlor cars, sleeping cars or on vessels.

(d) A tax of 5 cents upon each telegraph, telephone or radio, despatch, message or conversation for which a charge of 15 cents or more is made.

(e) A stamp tax on each passage ticket sold on or after December 1, 1917, by any vessel to a port or place not in the United States, Canada or Mexico.

(5) The tax of 3 per cent imposed under section 500 applies on amounts paid for the transportation of property by freight either rail or water or both, or by any form of mechanical motor power when in competition with carriers by rail or water, consigned from one point in the United States to another. It also applies on amounts paid for the transportation of milk and cream. (See Schedule A.)

(6) The tax of 1 cent for each 20 cents or fraction thereof paid for the transportation of parcels by express from one point in the United States to another, applies to excess baggage, bicycles, baby-carriages, dogs, etc., transported on passenger trains as well as to express.

(7) The tax of 8 per cent imposed by section 500 applies on amounts paid (in excess of prescribed minima) for the transportation of persons by rail or water, or both, or by any form of mechanical motor power on a regular established line when in competition with carriers by rail or water, from one point in the United States to another

point in the United States, or to any point in Canada or Mexico.

(8) Taxes imposed under section 500 must be paid in cash, or by check if the collecting officer, agent or conductor be authorized by the treasurer to accept checks in payment for transportation. Those imposed under paragraph 10 of Schedule A—Stamp Taxes, must be paid for in adhesive internal revenue stamps.

(9) The responsibility for levying, assessing, and collecting the taxes imposed under the act rests upon the officers, agents, conductors, or other employees of these companies whose duties are to collect revenues for the transportation of property or persons. It will also be the duty of such officers, agents, conductors, and other persons who collect such taxes to record and to make reports and returns of and for such collections to the appropriate accounting officer of their respective companies in the manner herein-after described or which may hereafter be required.

All such taxes so collected must be remitted with other company funds as required by the rules and regulations of the respective treasury officials of those companies having jurisdiction. Separate remittance or deposit reports or tickets for taxes deposited or remitted by officers or agents of these companies will not be required.

(10) The law specifically provides, in respect to transportation, that the tax shall be imposed upon amounts paid for the transportation of property by freight and for the transportation of persons.

The base of the taxes imposed under section 500 of the act are specified per cents (except in the case of telegraph and telephone tolls, and amounts paid for "parcels by express" as defined in Schedule B), of the amounts paid, above certain minima, for services rendered by public utilities; therefore intermediate or terminal costs for services rendered by public utilities, or others, such as costs for bedding, feeding or watering stock, reicing, etc., unless such costs are made a part of and are included in the rate charged for transportation, will not be subject to the tax.

(11) The law is specific as to what payments are taxable. It requires that all taxable collections shall be so recorded as to show whether the tax has or has not been collected when and as such amounts are paid.

It may be assumed the accounts, records and transactions of officers, agents and conductors of these companies will be examined and checked from time to time by representatives of the internal revenue department; you are therefore advised that such records and accounts must be so kept as to enable such examinations to be made; examinations shall be permitted when requested by properly accredited representatives of the internal revenue department.

Section 1004 of the law provides a penalty of not more than \$1,000 for failure to collect, or to truly account for and pay over such taxes.

(12) Section 502 of the act stipulates that the tax shall not be imposed upon any payment received for service rendered the United States, or any state, territory or the District of Columbia.

(13) Transportation costs for private property of officers and agents of the federal and of state governments, when such costs are not borne by such governments, will not be exempt from the tax.

(14) Transportation costs for transportation furnished officers and men for or on account of the British, Canadian or other recruiting missions of foreign governments will not be exempt from the tax, although such transportation be furnished on transportation request forms of the United States government.

The tax applying on amounts paid for such transportation will be billed against and collected from such governments when and as transportation charges are collected; therefore agents shall not demand payment of the tax when transportation is furnished on such orders.

SCHEDULE A—TRANSPORTATION OF PROPERTY BY FREIGHT

(15) The measure of this tax is three (3) per cent of the amount paid for the transportation of property by freight, by rail or water, or by any form of mechanical motor power when in competition with carriers by rail or water, consigned from one point in the United States to another.

(16) The tax of 3 per cent on amounts paid for the transportation of property by freight will accrue and must be levied, assessed and collected when and as freight revenues are collected, except that the tax may and should be computed at the time freight (expense) bills and prepaid shipping tickets or bills of lading are made; the amount of the tax must be shown on the face of each such bill, prepaid ticket, or lading.

(17) The tax must be assessed and collected on "collect" shipments by agents at destinations and on "prepaid" shipments by agents at points of origin; in other words, it must be levied, assessed and collected when and as collections are made from consignees, shippers, their agents or representatives. It must not be assessed or collected by junction agents on freight revenues on freights interchanged with connecting carriers.

(18) This tax of 3 per cent of amounts paid for the transportation of property by freight will apply on all such services wholly rendered after midnight of October 31, 1917, and on all "collect" consignments which start on the journey before November 1, 1917, but which do not reach destinations until after midnight October 31, 1917.

(19) There will be many parcels of property in transit as of midnight October 31, 1917, and agents of these companies must give careful consideration to such, to the end that errors and confusions may be avoided in complying with the law.

(20) The tax will not apply on:—

(a) Freight for which the entire transit service was performed prior to November 1, 1917, regardless of when the transportation costs be paid.

(b) Prepaid consignments received for which bill of lading is issued prior to midnight October 31, 1917.

(21) The tax will apply on all "collect" shipments which reach destinations on or after November 1, 1917.

(22) As to switching and other taxable freight services rendered:

(a) If switching service be performed before midnight October 31, 1917, and the service be paid for on or after November 1, 1917, the tax will not apply.

(b) If the service be paid for prior to November 1, 1917, and the service be not rendered until on or after November 1, 1917, the tax will apply and must be collected.

(c) If unused switching tickets on which collections have been made but for which no service has been performed as of midnight October 31, 1917, be in hands of purchasers, agents shall promptly notify holders thereof that the amounts paid for them will be subject to the tax, and the tax due thereon must be collected and reported.

(23) Agents must promptly on the morning of November 1, or sooner if practicable, carefully examine all freight bills and prepaid shipping tickets on hand and make such notations on them as will enable a quick and correct application of the tax thereto.

(24) If under credit arrangements two or more bills be due by one person, firm, or corporation such bills must be listed, on collection statements and the tax must be applied to each individual consignment shown on such statement. Such statements may include both "collect" and "prepaid" items; but freight and passenger items shall not be included in the same statement.

(25) Statements referred to in the preceding paragraph (24) must be carefully recorded on the station records in such manner as may be prescribed and they shall be preserved.

(26) If credit accounts, either freight or passenger, be relief remitted to, and collections be made through the audit office, agents making such relief remittances need not, except in specific cases which may be otherwise provided for,

assess the tax thereon; such assessments must be made in the audit office and collections shall be made through that channel.

(27) **Company Material:** The tax will not apply on these companies' proportion of transportation charges on company materials and supplies or on any commodity which is necessary for the use of these companies in the conduct of their business as such and is intended to be so used or has been so used.

Junction agents of these companies in paying foreign lines for transportation charges on company material, shall not pay the tax thereon to such foreign lines, as such tax will be assessed and paid by the company in relieving destination agents of such charges.

(28) **Western Union Telegraph Company Material:** Property transported as "free" under the Western Union Telegraph contract will not be subject to the tax.

(29) **Property transported by the Southern Express Company free under contract:** Packages transported as "free" under the contracts between Southern Express Company and these companies, will not be subject to the tax.

(30) The tax of 3 per cent applies on amounts paid for the transportation of property by freight "when consigned from one point in the United States to another."

It does not apply on shipments consigned to points in Canada or Mexico, neither does it apply to shipments consigned to foreign ports or places. If, however, a shipment intended for export be consigned to a port agent and it move to the port on a port lading, the transportation costs on it will be subject to the tax.

(31) **Miscellaneous Services—Property:**

The tax will not apply on miscellaneous services rendered when the charge therefor forms a part of and is included in the through rate charged for the road haul; such as

Switching and drayage, refrigeration, not on car service, demurrage, etc.

If, however, a charge be made for switching or drayage, wharfage, towage and lighterage, in addition to the through rate, the tax will apply on amounts paid therefor.

(32) **Switching:** Amounts paid for switching cars locally, that is, from one yard to another or from one industry to another, will be subject to the tax of 3 per cent, provided such amounts be not included in the through rate of a transportation charge made for a road haul.

(33) **Switching Absorber:** Amounts paid by one carrier to another for switching service rendered in effecting competitive deliveries will not be subject to the tax provided the amount charged for such switching be included in the rate charged for the road haul.

(34) **Reconsign Freight:** If a shipment consigned for delivery at one destination be ordered shipped to another destination with "charges to follow" tax must not be assessed or collected by the agent at the first or original destination. The agent at final destination must levy, assess and collect tax upon the total revenue, original starting point to final destination.

Transit Privileges—(35) It has been tentatively held, subject to the approval of the Secretary of the Treasury, that the measure of tax on amounts paid for transporting property stopped en route for in transit privileges shall be 3 per cent of the amount paid for the transportation of the finished product, starting point of the raw material to final destination of the milled or finished product, and that such tax shall be paid as and when such transportation charges are paid, provided, however, that amounts paid for transportation costs on such raw products points of origin to milling, dressing, cleaning, or refining points which may not be shipped from such intermediate points, shall be subject to the tax.

The application of the tax to in transit transactions presents intricate and complicated problems which will require

close and careful consideration by agents at points where the in transit privileges are granted, and also by the freight claim officers whose duty it is to adjust transportation costs on such shipments.

Milk and Cream—(47) It has been held that amounts paid for milk and cream transported on passenger trains will be subject to the tax, and that the tax rate on amounts paid therefor, shall be 3 per cent of the amount paid.

Milk tickets sold prior to November 1, 1917, and not used before that date, will be subject to the tax, and the tax must be collected thereon from the persons to whom the tickets were sold, before such tickets can be used for transportation.

SCHEDULE B—EXPRESS

(48) **Tax on Amounts Paid on Express Matter:** The act provides that the tax rate on express revenues shall be 1 cent for each 20 cents, or fraction thereof, paid for the transportation of any package, parcel or shipment by express from one point in the United States to another.

Agents and employees of these companies who also act for express companies must obtain instructions from the appropriate officer of such companies as to the collection of the tax on shipments by express.

Excess Baggage—(49) It has been held that amounts paid for excess baggage will be subject to the tax. The rate to be charged therefor will be the rate applied to amounts paid for shipments made by express,—that is 1 cent for each 20 cents or fraction thereof, paid for the transportation of excess baggage. That is to say if 20 cents or less be collected for excess baggage, the tax will be 1 cent, which must be collected; if the amount paid for excess baggage be more than 20 cents but less than 41 cents, the tax will be 2 cents, which must be collected, and so on.

Agents in selling excess baggage books must collect the full amount of tax on the amount paid therefor.

SCHEDULE C—TRANSPORTATION OF PERSONS AND SEATS, BERTHS, AND STATEROOMS

(50) The measure of this tax is 8 per cent of the amount paid for transportation furnished persons.

(51) It applies on amounts paid for all forms of transportation of persons sold and on all cash fares collected on and after November 1, 1917, for journeys originating in the United States destined to points in the United States, Canada or Mexico; except that: amounts paid for tickets or cash fares for continuous journeys costing 35 cents or less, and amounts paid for commutation or season tickets for trips less than 30 miles will not be subject to the tax.

(52) The tax must be levied, assessed, and collected by the officer, agent, conductor or other representative of these companies, who sells the ticket or collects the fare; it must be collected at the time collection is made for a ticket sold and at the time a cash fare is paid.

(53) In selling mileage, commutation and season books or tickets, assess and collect the tax on the total cost of the book or ticket sold.

(54) If a lump sum be paid for a train or a car for the purpose of transporting persons, the tax of 8 per cent shall be levied and collected on the gross amount paid for such train or car.

(55) If the charge for a chartered or special train for the purpose of transporting persons be a per capita rate and if the rate be 30 cents or more, the tax must be assessed and collected on each ticket sold or cash fare collected. If the charge be on a per capita basis with a guaranteed minimum, and the per capita collections be less than the minimum, the tax shall be assessed and collected on the minimum.

(56) Section 500 of the act takes effect November 1, 1917; there will be many persons in transit on tickets sold

prior to that date. The law makes the following provision for such cases:

"If a ticket (other than a mileage book) is bought and partially used before this section goes into effect [November 1, 1917], it shall not be taxed, but if it be bought but not used before this Section takes effect, it shall not be valid for passage until the tax has been paid and such payment evidenced on the ticket in such manner as the commissioner of internal revenue may, by regulation, prescribe."

(57) Under the provision recited in paragraph 56 preceding, conductors will demand the payment of taxes on any ticket (mileage books excepted), dated prior to November 1, 1917, which may be presented for passage after that date, unless such ticket and the conditions under which it is presented show conclusively that the ticket has been previously used for any part of the journey.

(62) Amounts paid for staterooms on vessels: If in selling a ticket for a journey, a part of which is by water, and the amount collected includes the cost of a stateroom, a tax of ten (10) per cent of the cost of the stateroom must be collected in addition to the tax of 8 per cent on the total transportation cost collected. Illustration:—If the transportation cost be \$40 and the cost of the stateroom be \$5 the tax will be 8 per cent on \$40 and 10 per cent on \$5, a total of \$3.70.

(63) Amounts paid for sleeper and parlor car or berths: If the ticket rate for a journey includes the cost of sleeping or parlor accommodation a tax of ten (10) per cent on the cost of such accommodation must be collected in addition to the 8 per cent tax on the transportation cost.

Agents and conductors of these companies must apply and collect the tax on all parlor car seats sold or collected by them in parlor or other cars belonging to or operated by these companies for which a charge is made; the tax upon the receipts from the sale of such accommodations must be accounted for to the appropriate accounting officer of the company to which the parlor car tickets are reported in such manner as he may prescribe.

Agents of these companies who sell Pullman accommodations must be guided by instructions issued by the Pullman Company in the collection and reporting of taxes on such accommodations sold by them.

(64) If a mileage book or any other form of ticket be issued in payment for advertising in lieu for cash, the selling value of such book or ticket will be subject to the tax.

Passage Tickets. (68) Paragraph 10 of Schedule A—Stamp Taxes imposes a tax upon the steamer's proportion of each one way and round trip passage ticket, for each passenger sold or issued in the United States for passage by any vessel to a port or place not in the United States, Canada, or Mexico, provided the cost of such ticket be more than \$10. The taxes on this class of ticket must be paid in adhesive internal revenue stamps to be furnished or paid for by purchasers. Such stamps must be affixed to contract portion of ticket; after being so affixed they must be cancelled by the person using or affixing them, writing or stamping thereon the initials of his or her name, and the date of application.

SCHEDULE D—TELEGRAPH AND TELEPHONE

(69) The tax payable on this class of service is: 5 cents upon each telegraph, telephone, or radio, dispatch, message, or conversation, which originates within the United States; for the transmission of which a charge of 15 cents or more is made for the entire service performed.

SOUTH WALES RAILWAY MEN AND THE EIGHT HOUR DAY.—South Wales railwaymen have decided that the time is not opportune to proceed with a demand for an eight hour day. They are convinced that, ultimately, they will gain more by honorably observing agreements.

NATIONAL ASSOCIATION OF RAILWAY COMMISSIONERS

The twenty-ninth annual convention of the National Association of Railway Commissioners held at Washington last week completed its four-day session on Friday, October 19, after deciding to hold its next year's convention at Washington on November 12. Officers were elected as follows: President, Edward C. Niles, of New Hampshire; first vice-president, Charles E. Elmquist, of Minnesota; second vice-president, C. M. Candler, of Georgia; secretary, James B. Walker, of the New York first district commission, New York City; assistant secretary, L. S. Boyd, librarian of the Interstate Commerce Commission.

SPECIAL WAR COMMITTEE

Responding to a suggestion made by President Thelen in his opening address, a resolution was adopted providing for the appointment by the president of a special war committee of five members, which "shall be charged with the duty of conferring with the appropriate federal and state authorities and with each state commission and of giving advice and suggestions as to what each commission can do affirmatively and constructively to help the Nation in the present emergency; and to select agents to carry out its objects and to make effective the offers of co-operation made by the president and the executive committee." One of the reasons given for the appointment of such a committee was that the state commissions might be enabled to learn of the desires and needs of the government direct instead of from the railroads. The following were appointed members of the committee: Max Thelen, of California, chairman; F. H. Funk, of Illinois; T. H. Whitney, of New York; J. B. Eastman, of Massachusetts; R. W. E. Donges, of New Jersey, and President Niles, *ex officio*.

The association held a dinner at the New Willard Hotel on October 17 at which the speakers were Herbert C. Hoover, United States food administrator; Samuel Rea, president of the Pennsylvania; Max Thelen, president of the association; Clyde B. Aitchison, of the Interstate Commerce Commission, and Senator Francis G. Newlands of Nevada, chairman of the Joint Committee on Interstate Commerce. Mr. Rea's address was published last week. Mr. Hoover complimented the roads on their service to the Nation. Senator Newlands declared that the successful prosecution of the war depends upon transportation more than upon anything else and that the government would either have to give the railroads permission to increase rates or lend them money.

A proposal was adopted that the name of the association be changed to National Association of Railway and Utilities Commissioners, because only a minority of the commissions represented in the membership are purely railroad commissions.

REPORTS OF COMMITTEES

In addition to the reports of committees referred to in last week's issue, the Committee on State and Federal Legislation, J. L. Bristow of Kansas, chairman, outlined the part taken by the committee in connection with the inquiry by the Newlands congressional committee. The committee stated that Mr. Thelen's testimony before the Newlands committee "showed that the main effort of the railroad executives was a concerted drive against the authority of the states for the purpose of depriving them not only of such powers as they now have over roads engaged in interstate commerce, by reason of the failure of the federal government to enter certain fields of regulatory activity, but also to deprive them of the right to regulate and supervise the purely state rates, service, facilities, equipment and safety of operation of all railroads which in any way engage in interstate commerce." It was stated also that Mr. Thelen had demonstrated that "the cause of the impaired credit of the railroads was not public regu-

lation, either state or federal, but could be found in unsound financial structures, unwise railroad construction and inefficient and at times criminal mismanagement of railroad finances."

The committee has an understanding that at the appropriate time all representatives of the state commissions who desired to be heard by the Newlands committee will be given full opportunity to present their views. In anticipation of this hearing, the committee prepared and submitted to a number of the older commissioners a questionnaire, the return of which affords much valuable information as to the jurisdiction exercised by the states and state commissions in regulation of interstate carriers. This information is now in the hands of the committee ready for use at such time as it may be needed. It was the view of the committee that it should be vested with the same general authority which was conferred upon it at the last convention for the purpose of taking any appropriate action which may assist the congressional sub-committee in obtaining all of the information which it may need for the discharge of its duties. This recommendation was adopted by the association.

The Committee on Car Service and Demurrage, F. H. Funk, of the Illinois Commission, chairman, expressed the opinion that one of the first great problems the new Division of Car Service of the Interstate Commerce Commission will be called upon to solve is the formulation of some practical and reasonable rules covering the matter of car distribution in times of car shortage, but in view of the present abnormal conditions the committee felt that any extended discussion of car service problems under present conditions would prove of little permanent value. E. H. De Groot, Jr., addressed the meeting briefly on the work of the Division of Car Service in co-operation with the Commission on Car Service and other bodies.

The Committee on Express and Other Contract Carriers by Rail, J. P. Webster, of the Georgia Commission, chairman, discussed the question as to whether express traffic should be taken over and handled by the express companies direct, expressing the opinion that such a step would not result in as good service to the shipper and receiver of express traffic as is given under present conditions.

The Committee on Capitalization and Intercorporate Relations, A. R. Weed, of Massachusetts Board of Gas and Electric Light Commissioners, chairman, presented a general discussion of the question and recommended that the association urge the immediate adoption of legislation substantially in accordance with the provisions of the Rayburn bill, independently of the question of federal incorporation and that such legislation shall embody the right of the state commissions to sit with the Interstate Commerce Commission and to participate in its deliberations on applications relative to the issue of securities by carriers organized or operating in the respective states, but shall exclude from its scope the securities of street railways.

VALUATION

The Committee on Valuation, C. E. Elmquist, of the Minnesota Commission, chairman, presented a general discussion of the progress made by the Interstate Commerce Commission in the valuation of railroad property. The committee stated that during the last year the carriers have made strenuous covert efforts, including a personal appeal to the President, to secure the discontinuance of proceedings under the valuation act, but that the committee is of the opinion that every reason which was ever urged as warranting the enactment of the law in the first place applies today with the same or greater force and that "there are additional reasons for the valuation that did not exist when Congress passed the law, such as the apparent imminence of government ownership as a live issue, the actual taking over of certain roads for war purposes, and the questions of com-

ensation and return which will grow out of the priority of shipments act and out of the new revenue system." A suggestion was made that the valuation will proceed more rapidly, more cheaply for the government and for the carriers and with less disturbance of the ordinary affairs of the railroads and the balance of the country if the carriers "cease their attitude of regarding the government as being a hostile party in a lawsuit."

The convention voted that a new valuation solicitor should be appointed by the committee to represent the state commissions at Washington in connection with the valuation proceedings, succeeding Mr. Aitchison, who has recently been appointed a member of the Interstate Commerce Commission.

C. A. Prouty, director of the Division of Valuation of the Interstate Commerce Commission, presented a general discussion of the valuation work. He said that the causes which had required the expenditure of so much time on the first preliminary reports would not occur again because the decision of the commission on the points raised in connection with those cases would serve as a guide for future work. He explained that unit prices as of June 30, 1914, are being used so that all of the valuations will be made on a common basis. If it is necessary to change them on account of increasing prices in the future they can all be changed at one time.

Referring to the cost of the work, Mr. Prouty said that up to October 1 the government had expended about \$9,500,000 and that the appropriation for this fiscal year is \$3,500,000. The commission expects to ask for a similar appropriation for the next fiscal year, and he still hopes that the cost to the government will not exceed his original maximum estimate of \$20,000,000. Mr. Prouty said that the cost to the government does not represent the entire cost because the public in the end also pays for the cost to the railroads. He said that the railroads have been passing around some very fantastic figures as to their costs, and he had no way of knowing what they were actually expending, but that the cost to the railroads ought not to exceed the cost to the government. He remarked, however, that the valuation expenses of the railroads include the cost of conferences at White Sulphur Springs, "where the golf course is one of the finest in the country and the cuisine cannot be surpassed." He also declared that a large part of the cost to the railroads is incurred, not for the purpose of contributing to the work, but for the purpose of attacking the work of the government, and is partly due to the fact that many of the railroads had not kept their records in the shape that a well-managed railroad should have kept them, so that the cost of compiling them now ought not fairly to be charged to the expense of the valuation. He added, however, that he had no fault to find with the co-operation being rendered by the carriers, which had been very helpful in many instances.

Director Prouty vigorously opposed the idea of discontinuing the valuation work on account of the war, saying that if the work had not been begun he would not now recommend that it be started, but that if it were discontinued in its present condition it would amount virtually to throwing away every dollar that has been expended. It took more than a year to organize the work originally and it would take that much time to begin it over again. He said the suggestion to suspend the valuation does not originate with the men who are operating the railroads, but with bankers and financiers who control the railroads and who do not want the valuation completed because it would render impossible the manipulations and speculations out of which they have made enormous fortunes. The time might come, Mr. Prouty said, when it would be necessary to discontinue the work, but so long as the ordinary activities of society are continued it would be a mistake to do so. Instead of saving money it would involve additional cost in the future and there are comparatively few men still engaged

in the work who would be likely to become engaged in the work of the war. The engineering force has already been seriously depleted, and the engineers have been encouraged to enlist and have been given leave of absence to go to training camps. Exemptions were asked for only 28 men, who were regarded as indispensable. When the war is over, there is likely to be a very great demand for transportation facilities, and the valuation will serve an important function as a basis for future financing.

While the division of valuation has taken the position that the law does not provide for the finding of an ultimate value, Mr. Prouty said that when all of the information has been collected it must all be put together in some way to determine the ultimate dollars and cents value. For example, he said, the Kansas City Southern is capitalized for about \$99,000,000, and the market value of its securities was found to be about \$62,000,000, the cost of reproduction new was placed at \$50,000,000, and the cost of reproduction less depreciation at \$40,000,000, while the original investment was found to be about \$47,000,000. These are the facts ascertained by the division, and the government must eventually determine what figure represents the value. By this, he said, he meant the value for rate-making purposes.

Glen E. Plumb, counsel for the railroad brotherhoods, read a paper on the subject of "Charter Limitations as Affecting the Value of Railway Property," maintaining that the property right of the railways is limited by their charters to their use for the public service, and that any value beyond this belongs to the public.

The convention decided to provide for a standing committee on public ownership and operation.

RATES

The Committee on Rates, A. E. Helm, of the Kansas Commission, chairman, expressed the opinion that as one step toward the establishment of a scientific method of establishing railroad rates, it is highly desirable that an effort should be made to bring about a uniform percentage relation of class rates for application upon both state and interstate business. The committee also expressed the opinion that the making of increases of rates upon a percentage basis is unlawful for the reason that it necessarily creates a discrimination between localities. It recommended that this method of making increases of rates should be disapproved by all commissions and that, if necessary, the law as relating to the subject should be amended to clearly prohibit the making of such increased rates. The report was discussed by B. H. Meyer of the Interstate Commerce Commission with special reference to the question of minimum carload rates. Commissioner Meyer said that the capacity of freight cars has increased to such a great extent that some railroads probably have too many large cars to suit the requirements of the shippers and not enough cars to meet the reasonable needs of the small shippers, who are sometimes required to pay an amount for a minimum carload which represents a high rate for the quantity actually shipped. Mr. Meyer thought the percentage of utilization of space in the small cars is greater in many cases than in the larger cars.

The report brought out an interesting discussion of various rate situations involving conflicts between the jurisdiction of the federal and state commissions, particularly as to passenger fares, which led to the adoption of a resolution authorizing the Committee on State and Federal Legislation to confer and co-operate with the Interstate Commerce Commission with a view to bringing before Congress a suggestion for legislation to specifically legalize co-operation between the state and federal commissions in such cases. Rate situations involving a conflict as to passenger fares were described by R. W. E. Donges of the New Jersey Commission, and P. J. Lucey of the Illinois Commission, both of whom declared that

they did not see how co-operation with the Interstate Commerce Commission would result in any agreement in their cases.

PROPOSED REDUCTION IN ACCOUNTING REQUIREMENTS

The Committee on Statistics and Accounts, Arthur A. Lewis, of the Washington Commission, chairman, presented a supplemental report of its conference with the statistical and accounting representatives of the Interstate Commerce Commission and of the Association of American Railway Accounting Officers on October 4, held at the request of the railroad committee to consider what elimination of and modification in reports now required from the railroads by the Interstate Commerce Commission and the commissions of the several states could properly be made in order to conserve accounting forces during the war. The committee stated that the representatives of the railroads urged the necessity for relief because there have already been put upon the railroads additional burdens, requiring large increases in their clerical forces; this additional help has been hard to obtain and the carriers have been obliged to take on inexperienced clerks. Having no occasion to doubt these allegations, the committee said, its members, together with the representatives of the Interstate Commerce Commission, have carefully considered and checked over the suggested changes in schedules embodied in the report prepared by a special committee of the railway accounting officers, with the result that they had reached the conclusion that some of the schedules proposed to be eliminated or changed should, in the opinion of the committee and the representatives of the Interstate Commerce Commission, be modified in certain particulars.

Before the consideration of the proposed curtailment of the reports was taken up, it had been made clear by the committee that it had no power to bind any of the state commissions and it was further understood that the changes recommended by the committee to be made are wholly an emergency war measure, to continue only during the war, including a short period of subsequent adjustment. It was also the committee's understanding that the proposed changes and eliminations as modified will not affect the present classification of accounts and that any data heretofore furnished which is now proposed to be eliminated, if found to be necessary and essential to any commission, will be furnished by the carrier in a special report. With this understanding the committee believes that the request for change in the schedules as modified can be accepted by the state commissions without any serious embarrassment, during the war period. This report was referred to a special committee for consideration during the convention, which presented another report making some further modifications in the proposed changes and in this form the action of the committee was approved.

THE CEYLON RAILWAY.—The Ceylon Government Railway comprises a system of 706 miles, of which only 22 miles are double track, and over a large portion of which the traffic is very heavy.

WAR LOSSES OF BRITISH UNION.—Up to August, 1917, there had been 2,998 members of the National Union of Railwaymen killed in action or had died from wounds.—*The Engineer, London.*

PRIVATE OWNERS' CAR ORDER IN ENGLAND.—By an order recently passed in England, when it appears necessary to increase the supply of cars to a colliery, the Board of Trade may take possession of any private owner's cars and use them for that purpose. In such cases the owner is to be paid for the use of the car such amount as may be agreed. Failing agreement, an arbitrator appointed by the Railway and Canal Commission will fix the sum to be paid.

What Pulverized Coal Means to Brazil

By Burning Brazilian Coal This Way, "The Fuel Problems of Our Country Are Solved," Says President Braz

AS much as the railroads and industries in this country are suffering from the present fuel situation, the problem is insignificant when compared with that of Brazil. With about 500,000 square miles of territory containing deposits of coal which can be easily mined and transported to the industrial centers, Brazil has been forced to import this material from Europe and America because of

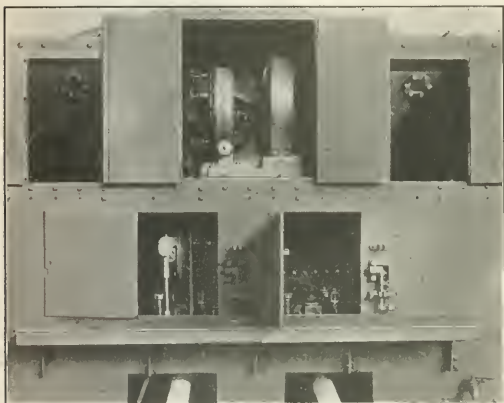
ordinary grates is impossible. The analysis of the coal is as follows:

Moisture	from 2 to 8 per cent
Sulphur	from 3 to 9 per cent
Volatile	from 14 to 28 per cent
Fixed carbon	from 34 to 58 per cent
Ash	from 26 to 30 per cent

The relatively high volatile and carbon content make it very desirable for fuel if it can be burned successfully.

The Brazilian fuel situation is of national importance and has a direct bearing on the political situation. Several extensive and expensive investigations have been made to find a means for successfully using this fuel, but until 1915 the problem remained unsolved. At that time an article appearing in the *Railway Age Gazette* describing tests made by the Locomotive Pulverized Fuel Company of New York, with pulverized coal on locomotives, was called to the attention of the government by the director of the Central Railway of Brazil, Dr. Miguel Arrojado Lisboa. This method of burning fuel not having previously been considered in connection with the Brazilian coal, Dr. Joaquim de Assis Ribeiro, chief of traction of the Central Railroad of Brazil, was sent to this country to make an investigation. The possibilities of this method were so apparent that 50 tons of Brazilian coal was shipped to this country for tests on the pulverized fuel burning locomotives. These tests proved so satisfactory that in May, 1916, Dr. J. J. da Silva Freire, sub-director and locomotive superintendent of the Central Railway of Brazil came to this country for further investigation, paying particular attention to the use of pulverized fuel in both locomotives and stationary boilers.

As a result of the second investigation the Central Railway of Brazil decided to install a pulverized fuel preparing plant, having a capacity of 15 tons per hour, to be used for steam locomotives and stationary boiler equipment at shops located at Barra do Pirahy, which is about 65 miles north



View of the Front End of the Tender Showing the Distributing Machinery

the fact that up to the present time it has been found impossible to burn the domestic coal successfully. In 1915 there was imported 1,346,147 metric tons, 561,150 of which came from America. The price of this coal has more than doubled on account of the war, the average price now paid



Pulverized Coal Burning Locomotive for the Central Railway of Brazil

being about \$40 per ton. Even at this high rate Brazil has been unable to obtain more than 75 per cent of its requirements.

The difficulties encountered with the use of Brazilian coal are due to the large amount of sulphur and iron pyrites contained in it, which combined with the ash forms such a large amount of clinker that efficient combustion on or-

of Rio de Janeiro. The plans and specifications for this equipment were prepared by the International Pulverized Fuel Corporation, the foreign agents of the Locomotive Pulverized Fuel Company under whose direction the Brazilian pulverized coal tests were made. At the same time an order was placed for twelve 10-wheel passenger locomotives to be equipped with that company's pulverized fuel burning

apparatus. These locomotives were built by the American Locomotive Company.

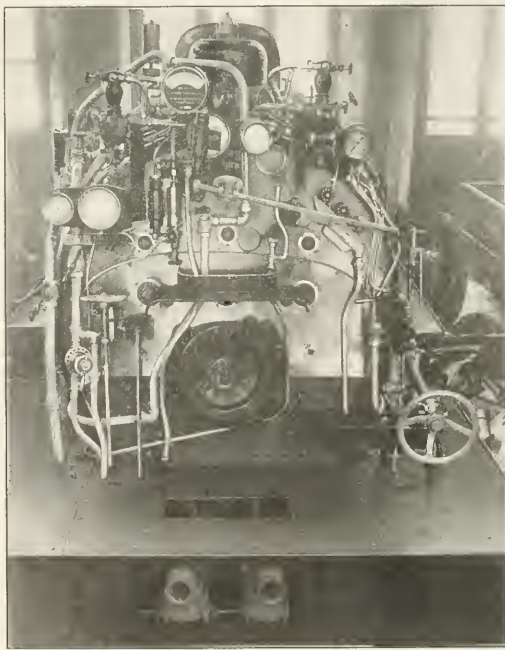
The ground was broken for the pulverizing plant May 17, 1917, and the plant was placed in operation August 22. The first locomotive fired with pulverized fuel was put into service August 27 and the rest of the locomotives were put into commission at the rate of one a day thereafter. On September 9 the first run was made with the pulverized National coal. This run was made with considerable ceremony, the president of the republic riding the locomotive throughout the trip. A report of the trip from an observer is given below:

"The first official experience with our national coal pulverized was realized yesterday, September 9, on the Central Railway of Brazil, with the special train that transported Dr. Wencenslao Braz, president of the Republic of Brazil, and his staff. Locomotive 282 was attached to the president's special train at Barra do Pirahy and pulled it to Cruzeiro, a distance of 147 kilometers, or about 90 miles, the time being three hours. The trip was made with excellent results, particularly in the long stretch between Barra do Pirahy and Cruzeiro.

"During a great part of the trip the president remained

exactly; the return 3 hours and 25 minutes. President Braz sent a telegram to the minister of public works, as follows: 'The fuel problems of our country have been solved.' He also sent a telegram of congratulations to Dr. Assis Ribeiro. The President and the director expressed themselves as being entirely satisfied and highly pleased at the demonstration, and also as to the simplicity of the machinery and control over the fire, which was thoroughly demonstrated while they were on the locomotive.

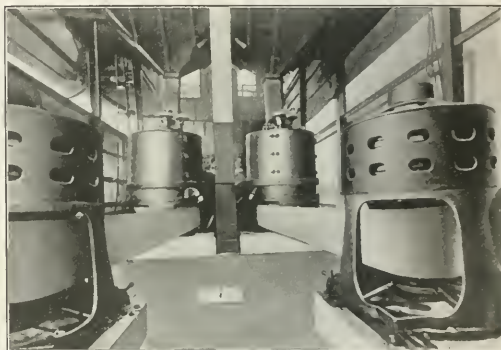
"On leaving the locomotive cab for his car, the President embraced effusively the engineer and fireman, and congratu-



Back Head of the Pulverized Fuel Burning Locomotive with the Cab Removed

in the locomotive cab, assisting with the feeding of the firebox with the national coal pulverized in the plant recently constructed at Barra do Pirahy, the coal having come from the Sao Jeronymo mine. The president of the republic showed himself very much impressed with the calorific value of the coal and the ease and regularity with which steam pressure was maintained by the locomotive throughout the trip, and without any smoke.

"The tonnage of the train was 210, which was hauled back, the total coal used being, as well as I can estimate, about 4 tons. The running time going was three hours



Interior of the Pulverizing Mill

lated Dr. Aguiar Mareira, director of the Central Railway of Brazil, on the results obtained."

At the conclusion of the trip the president sent the following telegram to Dr. Travers de Lyra, minister of railways:

"From Barra do Pirahy to Vargem Alegre I traveled on 10-wheel locomotive No. 282 fitted for the use of pulverized fuel, with excellent results. The trip was made with a velocity of 65 kilometers per hour, having a train of 210 units behind it. I take great pleasure to give you this communication, which I am certain will be received by all Brazilians interested as a solution of one of our most important national problems. Salutation. Wencenslao Braz."

With the successful use of native coal, Brazil has solved one of its most perplexing economic problems. The Brazilian government has contracted to equip 250 of the locomotives on the Central of Brazil with the pulverized fuel burning equipment during the next five years. This contract also includes the equipping of stationary boilers and industrial furnaces.

The 12 locomotives which were built in this country and sent to Brazil equipped to burn powdered fuel weigh 172,000 lb. and have a maximum tractive effort of 28,300 lb. They have a gage of 5 ft. 3 in., cylinders 21½ in. by 28 in., driving wheels 68 in. and weigh 122,000 lb. on drivers. They are equipped with firebrick arches and superheaters, have a total heating surface of 2,149.7 sq. ft. and a superheater heating surface of 428.2 sq. ft.

The illustrations show a view of the locomotive, a view of the back head of the locomotive with the cab removed, the front end of the tender containing the pulverized fuel distributing machinery and interesting views of the pulverizing plant.

AN ENGLISH SERVICE RECORD.—George Hall, of Coventry, who is 70 years of age, has completed 60 years in the service of the London & North Western, and drives an engine daily.

General News Department

The Union Pacific is training a class of women at Omaha in ticket selling, as well as in telegraphy and other station agents' duties.

Two armed men bound and gagged the express messenger on a Chicago, Memphis & Gulf passenger train, near Ridgley, Tenn., on October 18, and escaped with about \$12,000 in currency.

In the Federal Court at Louisville, Ky., the Louisville & Nashville has been fined \$200 for violation of the law prohibiting the shipment of cattle from quarantined territory, and the same sum for violation of the safety appliance act.

The Ironton Railroad, operating a line from Hockendauqua, Pa., westward, eight miles, to Siegersville, has notified the Pennsylvania Public Service Commission that at the end of this month it proposes to suspend passenger train service, because of high wages and a scarcity of coal.

The Mexican Government has ordered 3,000,000 bushels of corn in the United States, to relieve distress in Mexico. The corn is to be sent by way of Laredo, at the rate of 200,000 bushels every 20 days. On the railroads in Mexico the freight rate is to be one half the usual tariff.

The Brooklyn Rapid Transit Company, Brooklyn, N. Y., is training ten women to act as guards on subway trains. This company employs women as ticket sellers, and those now being instructed for the train service were picked from the waiting list of applicants for indoor places.

Recent tabulation of employees of the Nashville, Chattanooga & St. Louis now in the service of Uncle Sam, and those subject to draft, shows a total of 1,642 out of approximately 10,000 on the company's payrolls. So far 193 employees have enlisted in the army or navy, while 1,449 men in the several departments of the road are subject to draft.

The New York Central reports that forged drafts of the freight claims accounting department of the road have been found at a number of places in Rochester and Buffalo. The drafts are all drawn on the treasurer of the New York Central Railroad Company through the Lincoln National Bank, New York, for \$35 each, and all bear No. 79,870, dated Buffalo, October 4, 1917, to the order of James A. Oliver, 365 Glenwood avenue. No city is given.

Members of the Order of Railway Telegraphers, involved in a wage dispute with the Chicago, Rock Island & Pacific, presented testimony before an arbitration board in Chicago, last week. Among the demands of the men are: 20 per cent increase in pay, an eight-hour day, various adjustments in rules and certain vacation privileges. It is expected that the board will conclude its deliberations some time this week. The dispute is being arbitrated under the Erdman act by William C. Brown, vice-president of the Order of Railway Telegraphers, Chicago, and Owen D. Gorman, of Mauk, Ga., representing the telegraphers; C. W. Jones, general manager of the Rock Island, Des Moines, Ia., and E. S. Jouett, general attorney of the Louisville & Nashville, Louisville, Ky., representing the railroad; and Judge Stanton J. Pells and Prof. James H. Gore, Washington, D. C., representing the Federal Government.

Record-Breaking Aeroplane Flights

Lieutenant Resnati, an aviator of the Italian army who has been making experimental flights in this country during the past month, arrived at Mineola, L. I., 20 miles east of New York City, on Monday afternoon of this week in 4 hrs. 11 min. from Hampton, Va., carrying eight men besides himself. The distance is about 320 miles, making the average rate of speed about 76 miles an hour. The machine, a triplane, with 85 ft. spread of planes, has three motors of 160 hp. each. Most of the journey was made at a height of about 9,000 ft., at which height the temperature most of the time was about 32° F. On the same day Lieut. Baldrolì, also an Italian, made the same trip in a

210 hp. machine, carrying one passenger, in 2 hrs. 55 min., or at the rate of about 110 miles an hour. Passing over New York City, Lieut. Resnati rose to a height of about 12,000 ft. for the purpose of avoiding disagreeable "air pockets."

Morkrum Printing Telegraph on the Southern Pacific

The Southern Pacific has just put in operation a set of Morkrum printers between Ogden, Utah, and San Francisco, Cal. The wire is duplexed, releasing one wire. By the new apparatus 2,000 messages are sent daily, within a period of about 13 hours. This system is in use between San Francisco and Los Angeles.

More Liberty Loan Subscriptions

In addition to the fifteen roads noticed in the last two issues of the *Railway Age Gazette* as having subscribed a total of \$48,750,000 for the Second Loan Liberty Bonds, the following subscriptions have been recorded in the last week:

Atlanta & West Point.....	\$300,000
Delaware & Hudson.....	1,000,000
Illinois Central.....	1,000,000
Mobile & Ohio.....	420,000
Pittsburgh & West Virginia.....	250,000
St. Louis Southwestern.....	750,000
Union Pacific (additional).....	5,000,000

The total to date, including these items, is \$57,470,000.

Railroad Assistance for Russia

Three members of the American Railroad Commission which went to Russia early in the year to study the railway conditions of that country, with a view to extending assistance from this country, have returned to the United States with detailed recommendations in addition to the reports which have been sent by letter and by cable. Those who have returned are W. L. Darling, formerly chief engineer of the Northern Pacific; George Gibbs, consulting electrical engineer; and J. E. Greiner, formerly chief consulting engineer of the Baltimore & Ohio. They have reported a considerable improvement in the congestion at Vladivostok which has hampered the transportation of supplies over the Trans-Siberian Railway. Extensive plans for improving the condition of the road are now under way at Washington and elsewhere, under the direction of S. M. Felton, director-general of railways for the War Department. Twelve units of railway officers, consisting of division superintendents and their staffs, and including a considerable number of shop men, are being recruited to be sent to Russia. They will be under the direction of G. H. Emerson, general manager of the Great Northern.

Canadian Railways' War Board

"Canadian Railway Association for National Defence" is the name of the war board that has been formed in Canada. It will formulate a policy of railway operation to render the most efficient service to the nation. Plans include elimination of unnecessary service and co-operative use of all facilities. Lord Shaughnessy, Canadian Pacific; Howard G. Kelley, Grand Trunk; Sir William Mackenzie, Canadian Northern, and Alfred H. Smith, New York Central, constitute an executive committee. The administrative board is headed by U. E. Gillen, Grand Trunk, and the car service committee by W. A. Kingsland, Canadian Northern. The headquarters of the board will be at Montreal.

"Car Shortage" Increased

On October 1 the excess of unfilled orders from shippers for freight cars over and above the idle cars at different points numbered 70,380. This compares with a "shortage" of 77,682 on July 1; 33,776 on August 1, and 34,005 on September 1. The gross "shortage" this year was 94,572 cars, almost identical with the number (94,854) one year ago. The difference in the excess of unfilled orders over idle cars for the two years is accounted

for by the fact that in 1916 as many as 34,157 cars were idle, whereas this year only 24,192 were reported as idle, thus indicating a more efficient use of the available equipment on the part of the railroads.

The War Board on October 10 had been in existence exactly six months and the returns just at hand show that during that period the railroads of the country have rendered upwards of 15 per cent more service than they did during the same period last year with practically the same plant.

Send Christmas Packages Early

The campaign for early shipment of Christmas packages, already started in a number of places, is being pushed jointly by the American Railway Association's car service committees of Chicago, Milwaukee, Wis., and South Bend, Ind. Co-operation is promised by representatives of the National Industrial Traffic League and the Chicago Association of Commerce. Each railroad is to do everything possible to promote early shipments, whether by mail or express. Among prospective recipients are approximately a million soldiers in the various cantonments and training camps. The postoffice department has fixed November 15 as the last day for mailing Christmas packages to our soldiers and sailors abroad. There is already a shortage of baggage car equipment that affects the handling of mails. Unless the public takes into consideration the shortage of equipment and of labor that the railway mail service will be confronted with during the holiday period, serious congestion and consequent delays to Christmas mails will result.

Avoid Killing Live Stock!

The Commission on Car Service of the American Railway Association, adopting the appeal for saving animals which has been issued by certain western roads, has issued a circular of appropriate suggestions, designed to conserve the live stock of the nation. The circular is addressed to owners of live stock, town officers, newspaper editors and railroad employees. It says, in part:

"Do you know that thousands of horses, mules, cattle, hogs and sheep are killed annually by railway trains in this country, and that this economic waste, many millions of dollars, can be reduced? The thousands of horses and mules that are killed every year would fill the artillery requirements of many regiments, and the thousands of cattle, hogs and sheep that are killed every year would provide meat for thousands of soldiers. Owners of stock should keep their animals in fenced enclosures. Town officers should pass ordinances prohibiting the practice of permitting stock to roam at large. Superintendents, roadmasters and section men should make a personal appeal to owners to keep their animals in fenced enclosures. Section men should drive stock off right-of-way, and keep farm gates closed, and fences and cattle guards in good repair. . . ."

Food Administration Gives Relief for Cattle

The State Railroad Commission of Texas has thanked the United States Food Administration for its assistance in moving some 1,500 cars of live stock from drought stricken sections of that state to other locations where pasture and water could be obtained. An appeal was issued stating that a portion of Texas was undergoing the most severe drought in the history of the state for many years, and that cattle were dying by the hundreds for lack of food and water. Within 48 hours from the time the appeal reached the Food Administration at Washington stock cars were moving westward to the stricken districts. The worst conditions prevailed along the lines of the Texas & Pacific, and the Kansas City, Mexico & Orient, and these lines were unable to obtain anywhere in the West a sufficient number of cars to get the cattle out of the country. Edward Chambers, head, and F. S. Brooks, assistant head of the transportation division of the Food Administration immediately took charge of the situation and obtained cars in the Eastern section of the country and sent them to Texas. The Pennsylvania, the Wabash, the Burlington, and the Missouri Pacific furnished the first quota of 875 cars, the major portion from the Pennsylvania. A second consignment was required, of which the Chicago & North Western furnished 300 cars, the Chicago, Milwaukee & St. Paul 100, and the El Paso & Southwestern 150. The work of the Food Administration received hearty co-operation from the Commission on Car Service.

New Haven Employees in the Army and Navy

The New York, New Haven & Hartford reports that 893 of its employees have volunteered since war was declared; besides these the records now show that in the operating department alone 537 men have been certified for service in the National Army and 429 drafted. The company's records show that there are 9,073 men in the operating department subject to the selective army. Of this number 4,134 are married and 1,321 are single with dependents. There are 3,435 men in this department between the ages of 21 and 31 who are single and who claim no dependents. Of this latter number there are about 900 in the train service for whom the road would feel justified in claiming exemption for industrial reasons.

There have already been 3 conductors, 4 engineers, 62 firemen and 99 trainmen selected for the National Army. The total number of men in the operating department already called before their local boards is 1,583; the number drafted is equal to 4.9 per cent of those available for service.

Employees entering the military or naval service are considered as on authorized leave of absence and they will retain their seniority rights if exercised within 60 days after date of discharge from government service and if their physical condition is such as to permit them to resume their former duties.

The road proposes to claim exemption only for such men as are indispensable to operation or those specially trained.

Association of Manufacturers of Chilled Car Wheels

The annual meeting of the Association of Manufacturers of Chilled Car Wheels was held at the Waldorf-Astoria Hotel, New York, October 9. George W. Lyndon, president of the association, in his address called attention to the carrying capacity of the chilled iron wheel, saying in part as follows:

"It is now a well established fact that the load that can be carried on a chilled iron wheel is only measured by the ability of the rail to support it. Many 33-in., 950-lb. chilled iron wheels are running under heavy locomotive tenders of 12,000 gal. capacity and are giving such a good account of themselves that no other type of wheel is considered by the users.

"We must pay the closest attention to the quality of our product. We must see that the interior of the 625-lb. and 725-lb. wheel receives recognition in the matter of increased plate thicknesses which can only be obtained by additional weight. We must have a reasonable factor of safety when measured by excessive stresses encountered in service and these heat stresses are now recognized everywhere due to our educational campaign. We are not influenced by commercial considerations in asking for heavier wheels. We know the increased weights are necessary. Perhaps the analyses of the stresses within the wheel may suggest a redistribution of the metal and we may be able to decrease weights, which we will be ready to do with as great an interest as we are now anxious to increase them."

The following officers were elected for the ensuing year: George W. Lyndon, president and treasurer; E. F. Carry and J. A. Kilpatrick, vice-presidents; George F. Griffin, secretary, and F. K. Vial, consulting engineer. The following composed the board of directors: J. M. Buick, vice-president, American Car and Foundry Company; J. A. Kilpatrick, president, Albany Car Wheel Company; W. S. Atwood, chief engineer, Canadian Car & Foundry Company; Charles A. Lindstrom, assistant to president, Central Car Wheel Company; F. K. Vial, chief engineer, Griffin Wheel Company; E. F. Carry, president, Haskell & Barker Car Company; A. G. Wellington, president, Maryland Car Wheel Works; W. C. Arthurs, president, Mt. Vernon Car Manufacturing Company; J. D. Rhodes, president, National Car Wheel Company; F. B. Cooley, president, New York Car Wheel Company; A. J. Miller, general manager, Ramapo Foundry & Wheel Works and Win. F. Cutler, vice-president, Southern Wheel Company.

Association of Railroad Chief Surgeons

The Association of Railroad Chief Surgeons held its semi-annual meeting at Chicago on October 22. The following papers were read at the meeting: A Review of the Results of the Treatment of Burns with Ambrin, by Dr. L. W. Hopkins, chief surgeon of the Chicago & North Western, Chicago; The Carrel Method of Wound Treatment, by Dr. G. W. Cale, chief surgeon of the Frisco Lines, St. Louis, Mo., and The Hospital Associations and

Their Advantages to Railroad Companies, by Dr. M. P. Parrish, chief surgeon of the Wabash, St. Louis, Mo. Among the open topics of discussion were The Recruiting of Surgeons for War Service, Carious Teeth in Men Entering Railway Service, The Employers Liability and Compensation Law of Illinois, Iodine in the Hands of Railroad Employees, and The Advantages of Establishing Reasonable and Average Periods of Convalescence for Various Injuries.

Next Bridge and Building Meeting at New York

At the closing session of the American Railway Bridge and Building Association, held in Chicago on Thursday of last week, New York was selected as the location for the next annual meeting, subject to change by the executive committee, should conditions arise which would make some other location more desirable.

The annual meeting of the Bridge and Building Supply Men's Association was held the same morning, at which time the following officers were elected: President, L. D. Mitchell, Detroit Graphite Co., Detroit, Mich.; vice-president, P. C. Jacobs, H. W. Johns-Manville Co., Chicago; treasurer, Thomas Lehon, the Lehon Company, Chicago; secretary, C. E. Ward, U. S. Wind Engine & Pump Company, Batavia, Ill. Members of executive committee: E. J. Caldwell, the Barrett Company, New York; E. T. Howson, *Railway Age Gazette*, Chicago.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Watten Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—W. L. Connelly, Superintendent of Telegraph, Indiana Harbor Belt, Gibson, Ind. Next meeting, November 22, La Salle Hotel, Chicago.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Morrison Hotel, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CINCINNATI RAILWAY CLUB.—H. Boutet, Chief Interchange Inspector, C. & N. Ry., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November. Hotel Sinton, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 568 Union Arcade Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.

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

NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 34th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Geo. A. J. Hochgrebe, 623 Broadway, N. Y. Regular meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PACIFIC RAILWAY CLUB.—W. S. Wollner, Assistant to Chief Engineer, Northwestern Pacific R. R., San Francisco, Cal.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 307, P. R. R. Sts., Pittsburgh, Pa. Regular meetings, 2d Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial Annex Hotel, Pittsburgh.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Club has been suspended until after the war.

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

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.

TRAFFIC CLUB OF CHICAGO.—C. B. Sigart, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, 1st Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

WESTERN SOUTHERN RAILWAY CLUB.—E. S. Nethercut, Acting Secretary, 1735 Monadnock Bldg., Chicago, Ill. Regular meeting, first Monday in month, except January, July and August. Extra meetings generally on other Monday evenings except in July and August.

Traffic News

The Public Utilities Commission of Ohio has authorized an increase of 15 per cent in all freight rates, except on coal, coke and iron, for one year, effective November 20.

George W. Hibbard, for several years past general passenger agent of the Chicago, Milwaukee & St. Paul, at Seattle, Wash., and who recently resigned that office, has established a tourist and travel bureau, with headquarters in the Henry building, Seattle.

The government will suspend its priority order of shipment plans on Monday, October 29, in order to devote the entire production of the Ohio, Western Pennsylvania and Michigan bituminous coal mines for that one day to the emergency needs of the domestic consumers of Ohio and Michigan, the fuel administration announced today. This plan of devoting one day's production to the needs of a particular section will be followed in other cases.

The New York, New Haven & Hartford and the Pennsylvania have appointed a joint embargo committee, with headquarters in New Haven, to consider all applications for permits to make shipments through embargoes; this to facilitate communications between the New Haven and the Pennsylvania, and insure prompt action in all necessary cases. The committee will be known as the "New Haven Committee." The chairman is Richard Hackett, assistant to the senior vice-president of the New Haven road.

The United States Department of Agriculture is endeavoring to get merchants to stop shipping poultry in ice. It has been found that chilled dry-packed poultry reaches destination in much better order than the wet ice-packed product. Specialists of the department have studied shipments of chilled dry-packed poultry and wet ice-packed poultry which had been shipped in the same car, and found the dry-packed in excellent condition, while the wet-packed was unfit for use. A number of packers, at the instance of the department, have changed from wet to dry packing.

The Pennsylvania Railroad reports a saving of 56 cars a day in the transportation of less-than-carload freight, from Baltimore, Md., as the result of the "shipping day" or "sailing date" plan for handling this traffic, which was begun on October 1. In the first ten working days of October, 1916, an average of 182 cars was required daily to accommodate the l. c. l. freight originating in Baltimore, while in the corresponding period of the present year a daily average of 126 cars was used. The difference is affected to some extent by differences in embargo conditions, but by far the greater portion of the saving is directly due to the new plan. The increase in the average number of tons per car is 24 per cent. Officers of the road expect, eventually, on the lines East of Pittsburgh and Erie, to save upward of 1,000 cars a day in the transportation of l. c. l. freight.

Transportation Division, Food Administration

The transportation division of the Food Administration, of which E. Chambers, vice-president of the Santa Fe, is the head, has adjusted some troublesome differences between the express companies and the oyster and fish shippers of the country. The express companies, a short time ago, on account of delays to trains because of the abnormal demands made upon them, decided to stamp on each shipping ticket "Subject to delay on account of congestion." What they were seeking to do was to get away from liability for failure to reach the distant market at a certain hour in the day. Protests at once began to come in, most pronounced from the oyster shippers, who claimed that the uncertainty was extremely damaging to their business. Complaint was filed with the Interstate Commerce Commission and suits against the express companies were threatened.

Shippers from different sections of the country appealed to the Food Administration; and its transportation division, after considering the situation carefully, called a conference of the shipping interests and the express companies, with the result that

an understanding has been reached and the express companies are sending out a circular, saying:

"We have no desire to seek relief from responsibility for loss growing out of the negligence of the companies, or of employees; the endorsement on receipts for perishable shipments 'subject to delay, account of congestion,' can only apply to delay beyond control of the express companies; primarily it only puts shippers on notice that to or from the territory described, the expeditious express service which we formerly have been able to afford, cannot now be accorded. Instructions will be issued that preference be given in every way to government shipments and perishable matter, and that extraordinary care be used in reicing products requiring such attention."

Quick relief from threatened traffic congestion, liable to result in the rotting of great quantities of vegetables, has also been effected by the Food Administration, upon notification by the Farmers' and Fruit Growers' Association. The possibility of congestion was brought about by the announcement that the Montank Steamship Company would cease running its boats after October 11. The producing field, eastern Long Island, is dependent upon the steamship line for most of its shipping, its only other avenue of transportation being over the Long Island Railroad, which also owns the steamship line. The congestion of freight on the railroad without this additional burden, it was stated, precluded any possibility of getting these vegetables to the New York market over the railroad. The transportation division took the matter up with the president of the Long Island road, and the steamship line will continue in operation during the balance of October, and longer if necessary.

The transportation division has requested the California railroads to discontinue the loading of barley for the present; cars are needed for important foodstuffs. The movement of the Washington apple crop, the largest in the history of the state, is to begin at once. The Yakima, Wenatchee and Hood River districts will contribute approximately 18,500 carloads. A serious shortage of shipping facilities in the Payette valley of Idaho has developed in connection with the movement of apples and potatoes. The New York grape crop is now moving rapidly in refrigerator cars. Arrangements for equitable distribution were made by the Food Administration in advance of the movement.

Secretary Baker Praises Troop Movement

Secretary of War Baker, in his weekly statement on the progress of military operations issued on October 22, said:

"An interesting summary of troop movements in the United States shows that since the present mobilization began 914,195 persons have been transported by the railroads for the War Department, of whom 256,815 were transported in standard or tourist sleepers, the remainder in day coaches. This vast movement has been conducted by the railroads of the country without a single serious accident, and the co-operation between the railroads and the department has been most cordial and effective."

Aeroplane Invades Express Company's Field

The Triangle Distributing Corporation, on Thursday, October 11, sent a package of films from Buffalo, N. Y., to Rochester, by aeroplane, the shipment having missed the last train by which it could have reached the consignee in season for the afternoon exhibition. The flight, 70 miles in 45 minutes, was made by Roland Rohlf, an instructor at the Curtiss Aviation Training School. The showman, at Rochester, having complained to the shipper over the telephone and having received assurances that the pictures would be rushed through, announced the fact to his audience, and the people are said to have waited patiently. The aviator landed in a wheat field some distance outside the city.

In connection with the announcement of this flight the Triangle Distributing Corporation says that fourteen of its distributing branches make shipments numbering 6,617, of about 40 pounds each, every week, presumably all by express. This makes an aggregate of 264,680 pounds a week.

Heavy Shipments of New York State Peaches

The New York State Peach Belt—a 90-mile tract west of Rochester and mostly north of the New York Central main line—shipped this year 6,625 carloads, averaging nine tons each, as compared with 4,459 cars last year, the best season on record. The New York Central's Agricultural Department reports a

sweeping shift of the buying markets to more remote points. Sixty-four per cent of this season's fruit was shipped to Pittsburgh or points farther west, as against only 39 per cent last year. The nearby markets took correspondingly lesser proportions. The effect of the longer haul of the bulk of the crop was to tie up the available refrigerator cars for much longer periods and add to the car problem; the record shows that 38 per cent more cars were furnished, to handle an estimated 25 per cent increase in the crop.

Extraordinary weather pranks—particularly a sudden shift from cool to warm—ripened the big crop all at once and severely taxed the facilities of orchards, storage houses and railroads alike for several critical days. The fast-ripening fruit threatened to overflow all bounds; and, in fact, some fruit rotted before it could be gathered, the yield being much greater than the growers had estimated. Also, there were brief shortages of cars at some points. The total shipments by the New York Central, 6,625 cars at 18,000 lb. each, aggregated 119,250,000 lb. Only ten years ago the peach shipments were but 434 carloads; in 1908 they were 1,173 cars; 1912, 2,690 cars.

The Agricultural Department of the New York Central, headed by F. S. Welsh, kept a dozen trained inspectors traveling in automobiles, actively covering the peach districts. These men kept in close touch with growers, suggested better loading methods, reported local car shortages, watched against impaired fruit that would involve claims, noted the icing and other conditions, and in co-operation with local agents assisted toward most efficient freight service. This special service showed such benefits that the railroad company will at once extend it to the crop shipments of apples, celery, potatoes and other perishables.

Illustrated booklets were circulated giving detailed directions to growers regarding the safest methods of loading cars, and the shippers responded with hearty co-operation. Fully 60 per cent of the growers adopted the railroad's suggestion for end-to-end loading of the bushel baskets in four tiers, to prevent shifting in transit. The mobilization of refrigerator cars began early, and on August 16 there were 4,000 cars held in readiness. Throughout the succeeding month an average of 3,000 cars were kept in waiting for the ripening. At 75 cents per car per day, this item of preparedness cost \$2,250 a day, or \$67,500 for the month.

Cool weather delayed ripening until, late in September and heroic efforts could scarcely meet demands for a few days. The "peak" of the harvest was far the heaviest known. During this rush week the daily movement was 362 carloads, as compared with 240 cars daily in the busiest week last year, an increase of 50 per cent. The figures for the entire season show that an average of 187 cars were moved daily in 1917, as against 135 cars daily for the heavy 1916 crop.

The shift of peach shipments this year to more distant markets is shown by percentages of the distribution of the crops of 1917 and 1916, by the railroad records, as follows:

	1916		1917	
	Cars	Per Cent	Cars	Per Cent
To New York State points.....	1,115	25	861	13
To New England.....	401	9	265	4
To Pennsylvania and points South.....	1,204	27	1,259	19
To Pittsburgh and points West.....	1,739	39	4,240	64
Total.....	4,459	100	6,625	100

The shipments to the west, it will be seen, were almost 2½ times as large this year as last.

Japanese Railroad Construction

The Imperial Japanese Diet has passed a bill authorizing the expenditure of \$4,980,000 for the extension of the Boryo and Giran railway lines in Taiwan. Of this sum \$996,000 is to be expended annually for a period of five years, the railways to be completed by the end of the fiscal year 1921. Operations are to be begun before the end of this month (September, 1917). The construction contemplated is the extension of the Boryo Line from Ako to Boryo, with a view to serving the agricultural interests along the plain which the line will traverse, and the extension of the Giran Line from Ilatto to Suwo. The Giran extension, which is chiefly through mountainous country, is expected to aid the development of coal mining in Zuiho and Chosokei districts, where, hitherto, operation has been unsuccessful because of the difficulty of getting the coal out. It is expected also that new veins of ore will be discovered.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

Rates on Idaho Lumber Not Too High

Western Pine Manufacturers' Association et al v. Cincinnati, Indianapolis & Western et al. Opinion by Commissioner Clark:

The fact that through rates are composed of the aggregates of intermediate rates does not in itself establish their unreasonableness. Rates on lumber and lumber products from the inland empire to central freight association territory not shown to be unreasonable, unjustly discriminatory, or unduly prejudicial. Minimum weights not shown to be unreasonable. (46 I. C. C., 650.)

Rice Rates Reasonable

Lake Charles Rice Milling Company v. Southern Pacific Company et al. Opinion by Commissioner Clark:

Rates on rough rice from California points to Lake Charles, La., and on clean rice from Lake Charles to trunk line and Atlantic seaboard points not shown to be unreasonable or unduly preferential or prejudicial. Charges on certain shipments which exceeded those that would have accrued on the basis of the aggregates of the intermediate rates found unreasonable and repatriation awarded. Fourth section relief denied. (46 I. C. C., 661.)

Order as to Increased Rate Procedure

The Interstate Commerce Commission on Wednesday issued its fifteenth section order No. 1, prescribing the practice to be followed by railroads in presenting applications for permission to file tariffs containing increased rates, as required by the recent amendment to the fifteenth section of the law. The order is practically the same as the tentative draft, described in the *Railway Age Gazette* of October 12, page 661, which was the subject of a hearing on October 15. The form of application prescribed contains space for a statement as to what steps have been taken to bring the application to the attention of shippers and receivers.

Illinois-to-Iowa Rates Reduced

State of Iowa v. Wabash Railway et al. Opinion by Commissioner Daniels:

Upon complaint that commodity rates between Peoria or Springfield, Ill., and Des Moines and other designated interior Iowa cities, are not in compliance with the fourth section order of the commission in *Des Moines Commodity Rates*, 34 I. C. C., 281; and that they are unreasonable and unduly prejudicial; *Held*, That while the fourth section order in the case referred to has in terms been complied with, the finding of the commission in that case has not been followed; that the maintenance of higher rates between Peoria or Springfield and the designated interior Iowa cities than between Peoria or Springfield and St. Paul is unduly prejudicial; and that the rates in other respects are not found unreasonable. Fourth section relief denied. (46 I. C. C., 703.)

New York Storage and Reconsignment Charges Justified

New York Produce Exchange (on behalf of flour dealers) v. Baltimore & Ohio et al. Opinion by Commissioner Clark:

Reconsignment charge of \$2 per car established as an incentive to the direct billing of carload freight to places of final delivery within New York lighterage limits, and having for its object the relief of the congestion and car shortage situation at New York, found justified. Rule that a shipper from an interior point in the United States must, as a condition precedent to the issuance of a through export bill of lading, guarantee the payment of such storage charges as may accrue at New York after the expiration of free time, found justified. Rule that carload freight moved to New York as domestic traffic and subsequently exported cannot be accorded the benefit of the more liberal storage charges and regulations applicable to export traffic, which rule was designed to prevent the circumvention of embargoes against the movement of freight to New York before ship space is secured, found justified. (46 I. C. C., 666.)

COURT NEWS

The steam railroads entering Washington, D. C., on October 19 filed injunction suits in the District of Columbia Supreme Court against four ticket brokers to restrain them from selling tickets at reduced rates. The court issued rulings on each of the brokers named requiring them to show cause on November 9 why they should not be enjoined from selling any railroad ticket issued by the plaintiff companies or their connecting lines.

Interstate Commerce Commission Sustained

The Circuit Court of Appeals, Sixth Circuit, refused to disturb a finding of the Interstate Commerce Commission that a through rate from Houston to Chicago was unreasonable, so far as it exceeded the sum of the local rates, the finding being supported by evidence, though the local rate from Houston to New Orleans, used as a basis of comparison, applied only to shipments destined to points beyond New Orleans to which no through rates were published; no other rate from Houston to New Orleans being shown, and there being no attempt to show any reason for any distinction between Chicago and other points beyond New Orleans.—*Morgan's Louisiana & Texas R. & S. Co. v. Isaac-Joseph Iron Co.*, 243 Fed. 149. Decided June 5, 1917.

Hours of Service Act—Excusable and Inexcusable Derailments

In an action for the penalty for keeping trainmen on duty more than 16 hours, the railroad company filed pleas admitting the overtime, but alleging that it was due to the derailment of cars and the necessity of clearing the track, and that the accident occurred when it was impracticable to substitute another crew. The Federal District Court, S. D. Florida, sustained demurrers to the company's pleas because they were silent as to the cause of the derailment, holding that if the derailment could have been avoided by ordinary foresight the accident could not be said to be unavoidable, and unless it was unavoidable it was no defense to the action brought.—*United States v. Charlotte Harbor & Northern*, 243 Fed., 772. Decided August 1, 1917.

Safety Appliance Act—"Nearest Available Repair Point"

In a suit for penalties under the Safety Appliance Act it was alleged that the Boston & Maine Railroad hauled over its road, from Gardner, Mass., westward to East Deerfield, a box car which was out of repair by reason of a coupler being missing from the A end of the car. The car, billed from South Mills, Me., to Lake Junction, N. Y., was in a train which left Boston during the night of August 23, 1916; it became defective and was left behind at Gardner, between 1 and 2 o'clock the next morning, with one drawbar pulled out. It was turned around and was attached by its good coupler, behind the caboose, on a freight train going west from Gardner at 7:40 a. m. on August 24. On this train it was taken to East Deerfield, where it was repaired. This was the movement on which the complaint was based. The car contained about 45 pieces of freight, including one cask of gasoline. Gardner is not a repair point for such defects as the car developed. The nearest such point was Fitchburg, 17 miles east from Gardner; East Deerfield is 38 miles west. The freight in the car was destined to points west. The government contended that the car ought to have been taken to Fitchburg, because the distance was shorter. The Federal District Court held that the word "available" in the phrase "to the nearest available point" in the statute cannot be ignored. Availability obviously depends, under the statute, on other conditions besides that of mere distance. Whether Fitchburg was, under all the circumstances, the "nearest available" point for the repair of this car was a matter of business judgment. Upon such a question, involving as it does many elements, the decision of the men in charge of the business, if made in good faith, is entitled to serious consideration. It was not shown to have been wrong in this instance. On some of the freight speedy delivery may have been important, and it did not appear that there was any car at Gardner into which it could have been transferred. Although the distance of the haul was 20 miles longer than that to Fitchburg, the car "gained on the voyage," and its presence did not appear to have substantially increased the risk of injury to employees. Judgment was entered for the defendant.—*United States v. B. & M.*, 243 Fed., 795. Decided September 22, 1917.

Equipment and Supplies

LOCOMOTIVES

THE CHILIAN STATE RAILWAYS is inquiring for prices on 20 locomotives.

THE PENNSYLVANIA EQUIPMENT COMPANY, 1420 Chestnut street, Philadelphia, Pa., is in the market for one second-hand American type locomotive with 16 in. to 18 in. by 24 in. cylinders, and a weight of from 60 to 75 tons; also for 5 second-hand 6-wheel switching locomotives, 3 with a tractive effort of 30,000 lb., and 2 with a tractive effort of 20,000 lb.

FREIGHT CARS

THE UNITED STATES GOVERNMENT is asking for prices on 10,000 freight cars.

WILSON & COMPANY, Chicago, are in the market for 200 refrigerator cars.

THE BARRET COMPANY, New York, is reported as inquiring for 100 8,000-gal. tank cars.

THE PENNSYLVANIA EQUIPMENT COMPANY, Philadelphia, is in the market for 2 second-hand box cars of from 30 to 50 tons' capacity.

THE ILLINOIS CENTRAL is asking prices on 1,000, 70-ton hopper cars and it is expected will ask for bids on 1,500 50-ton general service cars.

THE WESTERN PACIFIC, reported in the *Railway Age Gazette* of October 12, as asking prices on 1,500 freight cars, has withdrawn its inquiries for these cars.

THE CHILIAN STATE RAILWAY, reported in the *Railway Age Gazette* of August 3, as inquiring for prices on 400 stock and 600 box cars is now asking for prices on 330 box, 230 stock, 200 gondola and 240 flat cars.

THE UNION PACIFIC, reported last week as contemplating the purchase of 5,000 freight cars is now reported as contemplating the purchase of 500 flat cars, 1,000 hopper cars, 1,000 drop bottom gondolas, 1,000 single deck stock cars, 200 tank cars, 50 caboose cars and 1,000 logging trucks.

THE RUSSIAN GOVERNMENT, reported in the issue of October 19 as having issued inquiries for cars, has placed tentative orders for good cars as follows: American Car & Foundry, 10,000; Standard Steel Car Company, 10,000; Pressed Steel Car Company, 6,000; Seattle Car & Foundry Company, 3,000; Keith Car Company, 1,000. These orders may be changed to include a number of eight-wheel freight cars.

PASSENGER CARS

THE CENTRAL OF GEORGIA has ordered 7 passenger coaches, 2 parlor cars, 3 express, 3 combination coach and baggage cars and 2 combination baggage and mail cars from the Pullman Company. This order was reported in last week's issue as 16 cars.

IRISH RAILWAY DISPUTE SETTLED.—A conference held recently in Dublin resulted in a settlement of the Irish railway dispute. The agreement arrived at provides that the workers on Irish railways shall be placed in exactly the same position as workers on English railways. An extra bonus of 3s. (\$0.72) per week has been granted to the Irish railwaymen, and the whole bonus is to be converted into a war wage, with consequent increases for overtime and Sunday work.

TRADE OF THE PORT OF LONDON.—The annual report of the Port of London Authority states that the total net tonnage of vessels which arrived and departed with cargoes and in ballast from and to foreign countries and British possessions, and coastwise, during the year ended December 31 last was 24,976,437 tons as compared with 30,890,531 tons during the year 1915. Both totals are exclusive of the tonnage of vessels employed by the government in connection with the war.

Supply Trade News

Clyde F. Burns, managing editor of the *Railway Review*, Chicago, has resigned to become general manager of the Richey Construction Corporation, New Port Richey, Fla., which is engaging in the construction and management of public utilities.

L. F. Wilson, vice-president of the Bird-Archer Company, Chicago, who was reported in last week's issue of the *Railway Age Gazette* as having been called into active service as major in the second division of the regular army, informs us that this order has been rescinded.

Oscar F. Ostby has opened offices at 2736 Grand Central Terminal, New York, to handle general railway supplies. He has been appointed eastern representative of the Grip Nut Company, Chicago, and manager of sales of the Glazier Manufacturing Company of Rochester, N. Y., the latter company making a complete line of oil headlights, and reflectors and cases for all kinds of headlights.

Mr. Ostby has been one of the energetic members of the Railway Supply Manufacturers' Association, having been its president in 1915-16. He has been much interested in the locomotive headlight field in the interest of the International Acetylene Association, strenuously combating the passage of headlight laws in several states the requirements of which demanded the electric equipment only. He was born March 5, 1883, and received his education in the public schools of Providence, R. I. From 1901 to November, 1904, he was engaged in publicity work. Since then he has been connected with the Commercial Acetylene Railway Light & Signal Company and the Refrigerator, Heater & Ventilator Car Company, serving the latter company as general manager.

Major Robert H. Murray, formerly general manager of the Chicago Bridge & Iron Works, Chicago, is now in command of the first battalion, 311th Engineers, Camp Grant, Rockford, Ill. He first received a commission as captain, but following a period of training at Fort Leavenworth, Kans., was promoted to major.

The Walter A. Zelnicker Supply Company, St. Louis, Mo., has recently secured the services of W. H. Bramman, who is acting in the capacity of assistant to the president. Mr. Bramman before becoming associated with the Zelnicker Supply Company was connected with the American Carbon & Battery Company.

Warren R. Roberts, president of the Roberts & Schaefer Company, engineers and contractors, Chicago, has received a commission as major under the Quartermaster General as executive officer in charge of new emergency construction work during the war. Mr. Roberts left Chicago on October 22 to take up his active work and residence in Washington.

John C. Sullivan, engineer and contractor, and formerly assistant superintendent of the O'Rourke Engineering Construction Company, died at his home, in New York city, on October 23. As assistant superintendent of the O'Rourke Engineering Construction Company he had charge of the construction of one of the North River tunnels of the Pennsylvania railroad.

In connection with the 3½ per cent semi-annual preferred dividend recently declared by the Lima Locomotive Works, Inc., it is understood that the earnings of the company for the period covered by the dividend were about five times the dividend re-



O. F. Ostby

quirement, leaving a balance for the common stock at the annual rate of about 17 per cent. Business now on the books of the company aggregates nearly \$21,000,000.

Major P. G. Jenks, Quartermaster Officers' Reserve Corps and in civil life assistant to the president of the Standard Steel Car Company, Chicago, presented regimental and national colors to the Thirty-fifth Engineers at Rockford, Ill., on October 19, on behalf of car construction companies which have orders from the government. Very appropriately the presentation speech was made by Louis Pitcher, a civil war veteran, who exactly 53 years before (October 19, 1864) was color bearer in the Union army in the battle of Cedar Creek. The Thirty-fifth Engineers is a railway regiment which is being recruited for the purpose of doing car construction work on the American-operated lines in France.

H. P. Meredith, master mechanic of the Maryland and Delaware divisions of the Philadelphia, Baltimore & Washington, has resigned to go to E. I. du Pont de Nemours & Co. as engineer in charge of mechanical maintenance and shop methods, with headquarters at Wilmington, Del. He was born January 12, 1879, in Gloucester county, Virginia, and was educated in private schools in Virginia and public schools of Altoona, Pa. He entered the service of the Pennsylvania Railroad as a special apprentice in 1897. In 1901 he became motive power inspector of the Buffalo & Allegheny Valley division at Buffalo; in 1903 he was promoted to assistant master mechanic of Altoona machine shops, and on July 1, 1905, was promoted to the position of assistant to the general superintendent of motive power at Altoona. He was made master mechanic of the Baltimore division at Baltimore, Md., on May 1, 1910, and on October 15, 1914, was promoted to master mechanic of the Williamsport and Sunbury divisions, with headquarters at Sunbury, Pa. On July 1, 1916, he was promoted to the position which he has just resigned. He is a member of the American Society of Mechanical Engineers, the Master Car Builders' Association, and the American Railway Master Mechanics' Association.

Page Steel & Wire Company

This is the new name of the Page Woven Wire Fence Company, the change having been made because of the growth and diversification of the company's business. Beginning with wire fencing, the Page company has extended its activities so as to include many other products of high-carbon steel, including wire rods, rope wire and spring wire. The company also has exclusive licenses for the sale of "Armco" iron wire, made by the American Rolling Mill Company of Middletown, Ohio, and other specialties. E. C. Sattley, general manager of the Page Steel & Wire Company will have an office at 644 Union Arcade, Pittsburgh, Pa.; but correspondence for the different departments should be addressed, as before, to Monessen, Pa., Adrian, Mich., New York City or Chicago.

Anniversary of Joseph T. Ryerson & Son

Joseph T. Ryerson & Son, Chicago, will celebrate the seventy-fifth anniversary of its organization on November 1. The founder, Joseph T. Ryerson, came to Chicago in 1842 and located in a two-story brick building near Clark and Water streets. He secured a stock of \$30,000 worth of iron and began business as the accredited agent of Wood, Edwards & McKnight, of Pittsburgh. In 1879 he took his son, Edward L. Ryerson, into partnership, and upon his death on March 9, 1885, the business passed to his son. Edward L. Ryerson continued as president of the company until 1911, when he was made chairman of the board of directors. His sons, Joseph T. Ryerson, Donald M. Ryerson and Edward L. Ryerson, Jr., have entered the firm during the past 15 years and are now vice-presidents.

The Chicago plant of the firm has grown continuously in size with frequent changes in location to permit further expansion, and at the present time is located at Sixteenth and Rockwell streets. The plant is divided into two main sections, one division including a warehouse 500 ft. by 500 ft., housing heavy materials, such as large billets, plates and structurals, and the other a five-story office building and a warehouse 500 ft. by 500 ft., in which are stored bars, shafting sheets, tubes, rivets, bolts, nuts, boiler specialties, machinery, etc.

The eastern plant of the company occupies a 10-acre site on West Side avenue, Jersey City, at the junction of the Hackensack

river and Newark bay. The building is 245 ft. by 470 ft., with a floor space of approximately 137,000 sq. ft. The company acquired a St. Louis plant by purchasing the W. G. Hagar Iron Company, thereby adding to its own products a line of mill, mine and boiler-makers' supplies manufactured by the Hagar company. A new plant will be opened at Detroit, Mich., on November 1, to take care of the increased demand for quick shipments of iron and steel in the territory served by that city.

Anniversary of Taylor-Wharton Iron & Steel Company

The one hundred and seventy-fifth anniversary of the founding of the iron industry at High Bridge, N. J., which finally developed into the Taylor-Wharton Iron & Steel Company, was celebrated in that town on October 13. The date was also the 25th anniversary of the first making of manganese steel in America, the first heat of manganese steel having been run off by the Taylor Iron & Steel Company in 1892. The introduction of manganese steel into track work by William Wharton, Jr., & Co., occurred in August, 1894, a little over 23 years ago. The celebration was largely attended by officers and employees of the Taylor-Wharton Iron & Steel Company and its subsidiaries, and the entertainment features included a parade, speeches by prominent men, a band concert, a moving picture program, a clam-bake and dancing. An important part of the festivities was the presentation of gold medals to employees who had been in the service of the company or allied companies for 50 years or more, and silver medals to those with records of service of from 25 to 50 years.

The local deposits of iron ore, abundant timber for charcoal, and water power were the chief factors leading to the location of the iron industry at High Bridge. In colonial times Robert Taylor took over the management of the business, and from him it passed through five generations in a direct line of descent. In 1912 the Taylor Iron & Steel Company purchased William Wharton, Jr., & Co., Inc., Philadelphia, for the purpose of extending the use of manganese steel in track work. The present Taylor-Wharton Iron & Steel Company has five plants: the High Bridge plant, operated directly under the firm name and devoted entirely to the manufacture of manganese steel and other special steel castings; the Easton (Pa.) plant operated under the name of William Wharton, Jr., & Co., Inc., specializing in track work, such as frogs, switches, curves and track layouts for steam and electric roads, as well as all kinds of light and heavy iron and steel forgings for castings; the Philadelphia Roll & Machine Company, making rolls and rolling mill machinery, iron and steel castings, and machinery of a miscellaneous nature; the Manganese Steel Safe Company, Plainfield, N. J., and the Tioga Steel & Iron Company, Philadelphia, which produces light and heavy miscellaneous hammered and hydraulically pressed forgings, and is now turning out a heavy tonnage or rough machined and heat-treated forgings for 4-in. Navy guns.

TRADE PUBLICATIONS

INSULATING BRICK.—The Armstrong Cork & Insulation Company, Pittsburgh, Pa., has issued a folder describing tests made to determine the economy in fuel obtained by the use of Nonpareil insulating brick for boiler settings. One illustration is included showing the method of applying the insulating brick in the boiler setting. The tests showed that 63 per cent of the heat lost was saved by the use of this brick.

POWER REVERSE GEAR.—The Economy Devices Corporation, 30 Church street, New York, has issued bulletin No. 115 describing the type "B" Ragonnet power reverse gear, which is a new design recently placed on the market. The catalogue enumerates the advantages of the power reverse gear and explains the cushioning principle of the type "B" gear. A sectional drawing of the gear is included showing the names of the various parts of the gear.

LOCOMOTIVE FEEDWATER HEATING.—The Locomotive Feedwater Heater Company, 30 Church street, New York, has issued its first bulletin describing the advantages to be obtained by heating the feedwater for locomotive boilers. The bulletin points out the saving to be made in waste heat feedwater heating. Charts showing what economy may be expected by heating the feedwater with exhaust steam from the cylinders are given, and illustrations showing the application of the feedwater heating apparatus to locomotives.

Railway Construction

BUFFALO, ROCHESTER & PITTSBURGH.—Work is now under way near Punxsutawney, Pa., on the construction of a new engine terminal, a 16-stall roundhouse and auxiliary facilities. The work includes changing the course of a highway from the east to the west side of the tracks for a distance of over one mile and ten miles of additional yard track will be constructed. It is expected that the work will be finished by January next. The freight transfer platform at Punxsutawney and the Ganson street freight house at Buffalo are being enlarged.

CAMBRIA & INDIANA.—Work has been completed on a new extension from Revloc Junction, Pa., via Euclah, to Revloc, about 6½ miles.

CANTON & OHIO RIVER (ELECTRIC).—This company has been authorized to build, lease and operate an electric line from Canton, Ohio, to Wheeling, W. Va. The projected route from Canton is southeast via Osnaburg, Minerva, Malvern and Carrollton to Toronto, then south via Steubenville, and Martin's Ferry to Bridgeport, thence east across the Ohio river to Wheeling, about 100 miles. The promoters expect to develop a traffic in coal, manufactured goods and farm products. Milton Bejach, president; James D. White, secretary and treasurer, Pittsburgh, Pa.

CHICAGO, ROCK ISLAND & PACIFIC.—This road has awarded a contract to the Railroad Water & Coal Handling Company, Chicago, for a high pressure water system for the fire protection of its elevators at South Chicago.

ILLINOIS CENTRAL.—This company has awarded a contract to the Railroad Water & Coal Handling Company, Chicago, for a 600-ton coaling station at Kankakee, Ill. The structure will be of timber construction with a concrete substructure. Automatic machinery will be used throughout. A contract was also awarded to the same firm for a fire protection system for yards and shops at Nonconca (Memphis), Tenn.

OREGON SHORT LINE.—This company has awarded a contract to the Utah Construction Company, Ogden, Utah, for the construction of a line from Garland, Utah, south along the west bank of Bear river to Bear River City, Utah, 9.7 miles. It will connect the line from Corinne, Utah, to Malad, Idaho, with the line from Ogden, Utah, to McCannon, Idaho. The maximum grade will be 1½ per cent and the maximum curvature 3 deg. The grading will be light. The only structures to be built are 20 spans of trestle. About 60 per cent of the grading is completed.

The company has completed grading on a spur from Bakers, Utah, north 3.8 miles.

PELLA-LEFFLER SHORT LINE.—This company has been incorporated with \$300,000 capital stock to build a line from Pella, Iowa, to a junction with the Wabash, about 4½ miles. P. H. VanGorp, secretary and treasurer, Pella, Iowa.

PHILADELPHIA, BALTIMORE & WASHINGTON.—A contract has been given to the James McGraw Company for the grading and masonry work on the Chester & Philadelphia branch now under construction to Hog Island, 11.2 miles. Contracts for three small span bridges on the line near Chester, Pa., have been let as follows: For the superstructures of bridges over Darby and Crum rivers to the Bethlehem Steel Company and for the superstructure for Ridley river bridge to the McClintic-Marshall Company.

SHELBYVILLE & FRANKFORT (ELECTRIC).—The plans of this company call for building an electric line from Shelbyville, Ky., east, to connect with Clay Village, Peytona, Grafenberg and Bridgeport, about 20 miles. The work will include building four steel bridges and two power houses. Contracts are expected to be let in the near future, and construction work completed in 1918. The company expects to develop a traffic in farm products. E. H. Taylor, Jr., president, Frankfort, Ky.

SOUTHERN RAILWAY COMPANY IN MISSISSIPPI.—This company has authorized improvements to its passenger station at Columbus, Miss., consisting of the reconstruction of an umbrella shed with concrete pavement under it. The improvements will also include the erection of a new baggage room and ice house.

Railway Financial News

CENTRAL OF NEW JERSEY.—The New Jersey State Board of Public Utility Commissioners has approved an agreement of merger and consolidation between the Central of New Jersey and the following connecting railroads, which are all a part of the Central's system, but which have been operating under separate corporate names: Buena Vista, Carteret & Sewaren, Carteret Extension, Cumberland & Maurice River, Cumberland & Maurice River Extension, Freehold & Atlantic Highlands, Lafayette Railroad, Manufacturers' Extension, Middle Brook, New Jersey Southern, Navensink Railroad, Passaic River Extension, Raritan North Shore, Sound Shore, Toms River, Toms River & Barnegat, Vineland Railroad, Vineland Branch, West Side Connecting, and the West End Railroad Company.

ILLINOIS CENTRAL.—The directors have declared the regular quarterly dividend of 1½ per cent and an extra dividend of 1 per cent, the latter for the year 1917. Both dividends are payable December 1 to stock of record November 5.

MISSOURI, KANSAS & TEXAS.—See item under Court News, *Railway Age Gazette*, October 19, 1917, page 718.

MOUNT AIRY & EASTERN.—This 19-mile line operating between Mount Airy, N. C., and Kibler, Va., has been sold to Washington parties.

NEW MEXICO CENTRAL.—This road has been bought by the Federal Export Corporation of 115 Broadway, New York. It lies in a section of New Mexico that has recently been opened to oil developments. The line is 120 miles long, from Santa Fe, N. M., on the main line of the Atchison, Topeka & Santa Fe, south and southeast to Willard, 80 miles, where it crosses a branch of the Santa Fe, and thence to Torrance, where it connects with the El Paso & Southwestern. The Federal Export Corporation contemplates the electrification of the road or its re-equipment with internal combustion locomotives.

NEW YORK, NEW HAVEN & HARTFORD.—Authority to issue \$45,000,000 of new 7 per cent preferred stock was given the directors at a special meeting of the stockholders October 24. The proposed issue would take up floating indebtedness now represented by a like amount of one-year 6 per cent notes, collateral for which to the amount of \$96,512,516 (book value) has been pledged.

TENNESSEE CENTRAL.—At the fifth attempt to sell this road at auction, no bids were received, and the sale was adjourned to November 30.

WESTERN MARYLAND.—It is said John D. Rockefeller and closely allied interests have agreed to purchase the \$5,000,000 three year 7 per cent notes authorized by the stockholders at their annual meeting. It is understood that these notes will be issued in payment of loans made to the company by Mr. Rockefeller and his associates.

STRIKE IN ARGENTINA.—According to a press despatch, a railway strike of 23 days' duration which paralyzed the transportation system of Argentina was brought to an end on October 18. The strikers notified the president that they were not satisfied with a 10 per cent increase in pay granted by the railroad companies, but that they were resuming work as a mark of personal respect to the nation's executive.

CHEMICAL HEATER FOR SOLDIERS.—The Tech of Boston tells of an individual heating apparatus for soldiers which Colonel Robert L. Howze is now testing to determine its practicability. The heater is not larger than a canteen and it is claimed that it will keep hot for 36 hours and can then be recharged for another period. The heater is filled with a chemical fluid which is first heated by immersion in boiling water. The chemical action increases the heat to a high degree and maintains it for 36 hours. A new charge is a chemical substance no larger than a pea. The "stove" and fuel may thus be carried by a soldier in his haversack.

Railway Officers

Operating

J. C. Bailey has been appointed car service agent of the Desmoer & Lake Erie, with headquarters at Pittsburgh, Pa., succeeding F. A. Huber, resigned to go with another company, effective November 1.

W. C. Hamilton, trainmaster of the Copper Range, also has been appointed car accountant, with office at Houghton, Mich., succeeding G. H. Wescott, who continues in his position of general freight and passenger agent.

Frank Walker has been appointed trainmaster of the Springfield district of the Illinois Central, with headquarters at Clinton, Ill., succeeding Harry L. Moffett, granted leave of absence on account of ill health, effective October 8.

E. B. Kessler, assistant freight trainmaster of the Long Island Railroad at Jamaica, N. Y., has been appointed freight trainmaster vice W. E. Canning, promoted, and John Roe, assistant trainmaster at Jamaica, has been appointed assistant freight trainmaster, succeeding Mr. Kressler.

W. E. Fuller, special representative of the vice-president in charge of operation of the Chicago, Burlington & Quincy, with headquarters at Chicago, has been appointed superintendent of the Galesburg division, with office at Galesburg, Ill. E. J. Worden, superintendent at Galesburg, has been transferred to the La Crosse division at La Crosse, Wis., succeeding M. F. MacLaren, who has joined the Russian Railway Service Corps. Effective October 23.

J. W. Jones, superintendent of the Western division of the Wabash at Moberly, Mo., has been appointed superintendent of the St. Louis Terminal division, vice C. E. Ocheltree assigned to other duties. W. H. Eckard, superintendent of the Moberly division at Moberly, Mo., succeeds Mr. Jones, and L. W. Karnes, trainmaster at Decatur, Ill., has been promoted to superintendent of the Moberly division, with office at Moberly, Mo., vice Mr. Eckard.

O. R. Belcher, whose appointment as superintendent of the Nevada-California-Oregon, with headquarters at Alturas, Cal., was announced in the *Railway Age Gazette* of September 28, was born at Bryan, Tex., on October 7, 1881. He began railway work in July, 1897, with the Texas Central, afterwards the Missouri, Kansas & Texas of Texas, and was employed successively as section laborer, foreman, agent, train despatcher and conductor, until his recent appointment announced above.

F. H. Hammill, assistant general superintendent of the Chicago & North Western at Bonne, Ia., has been appointed general superintendent of the newly created northern district of the Union Pacific, consisting of the Nebraska, Wyoming and western divisions, with headquarters at Omaha, Neb.; and E. Stenger, general superintendent at Omaha, has been transferred to Kansas City, Mo., to become general superintendent of the newly created southern district, consisting of the Kansas and Colorado divisions, effective October 20.

T. F. Lowry, superintendent of the Rocky Mountain division of the Northern Pacific, at Missoula, Mont., has been transferred to the Montana division with headquarters at Livingston, Mont., to succeed B. O. Johnson, who has been granted a leave of absence to join the Russian Railway Service Corps. F. R. Bartles, superintendent of the Minnesota division with headquarters at Staples, Minn., has been transferred to the Rocky Mountain division to succeed Mr. Lowry. E. J. Hackenberg, trainmaster at Staples, Minn., has been promoted to superintendent at Staples to succeed Mr. Bartles. A. W. McClelland has been appointed trainmaster in place of Mr. Hackenberg. Effective October 20.

E. E. Nash, assistant general superintendent of the Chicago & North Western at Chicago, has been transferred to Boone, Iowa, succeeding F. H. Hammill, appointed general superintendent of the Union Pacific. H. M. Eicholtz, superintendent of the Chicago & North Western at Chicago, has been promoted to assistant

general superintendent vice Mr. Nash; B. E. Terpnung, superintendent at Belle Plaine, Iowa, has been transferred to Chicago vice Mr. Eicholtz; F. O'Brien, superintendent at South Pekin, Ill., has been transferred to Belle Plaine vice Mr. Terpnung; C. E. Helmer, assistant superintendent at Winona, Minn., has been promoted to superintendent at South Pekin vice Mr. O'Brien, and S. S. Long, division engineer of the Wisconsin division, has been appointed assistant superintendent at Winona, Iowa, vice Mr. Helmer.

W. B. McCaleb, superintendent of the Philadelphia division of the Pennsylvania Railroad, has been promoted to general superintendent of water companies to succeed the late George S. Cheyney; J. K. Johnston, superintendent of the Tyrone division, Tyrone, Pa., has been appointed superintendent of the Philadelphia division to succeed Mr. McCaleb; J. B. Hutchinson, Jr., assistant superintendent of the Pittsburgh division, at Youngwood, Pa., has been promoted to superintendent of the Tyrone division; H. H. Russell, division engineer of the Pittsburgh division, at Pittsburgh, has been promoted to assistant superintendent of the Pittsburgh division, and George C. Koons, assistant engineer of maintenance of way in charge of bridges and structures at Philadelphia, has been promoted to assistant superintendent of the New York division. Effective October 25.

J. M. Gruber, vice-president of the Great Northern, with headquarters at St. Paul, Minn., has assumed also the duties of general manager heretofore discharged by George H. Emerson, whom the Government has called to take charge of the Russian Railway Service Corps, and who has been granted an indefinite leave of absence by the Great Northern for that purpose. C. O. Jenks, assistant general manager at St. Paul, has been appointed assistant general manager of the lines west of Williston, N. D., with headquarters at Seattle, Wash. F. Bell, general superintendent at St. Paul, has been appointed assistant general manager of the lines from Williston, N. D., east, with the same headquarters. F. S. Elliott, general superintendent at Great Falls, Mont., has been appointed general superintendent of the lake district, with office at Superior, Wis., succeeding G. S. Stewart, given an indefinite leave of absence to enter the Russian Railway Service Corps. L. W. Bowen, assistant general superintendent at St. Paul has been appointed general superintendent of the eastern district, with headquarters at St. Paul, succeeding F. Bell, promoted. W. R. Smith, assistant general superintendent at Spokane, Wash., has been appointed general superintendent of the Central district, with office at Great Falls, Mont., in place of F. S. Elliott, transferred. P. F. Keating, superintendent at Whitefish, Mont., has been appointed assistant general superintendent of the eastern district, with headquarters at St. Paul, succeeding L. W. Bowen, promoted. John Sesser, superintendent at Superior, Wis., has been appointed assistant general superintendent of the central district, with headquarters at Great Falls, Mont., to succeed F. D. Kelsey, who has been transferred as superintendent of the Superior and Mesabi divisions at Superior in place of Mr. Sesser. F. J. Gavin, superintendent at Spokane, Wash., has been appointed assistant general superintendent of the western district, with the same headquarters, vice W. R. Smith, promoted. J. L. Close has been appointed superintendent of the Spokane division at Spokane, succeeding F. J. Gavin, promoted. M. C. LaBertey has been appointed superintendent of the Havre division, with headquarters at Havre, Mont., vice E. D. Woodcock, assigned to other duties. M. J. Flanagan, general master mechanic at Great Falls, has been appointed superintendent of the Kalispell division, with headquarters at Whitefish, Mont., succeeding P. F. Keating, promoted. Effective October 20.

Traffic

Frank I. Smith has been appointed commercial agent of the St. Louis Southwestern at Denver, Colo.

R. M. Dozier, assistant general freight agent of the Missouri Pacific at Omaha, Neb., has been transferred to Memphis, Tenn., effective October 15.

John B. Patterson, passenger agent of the Atlanta & West Point and the Western Railway of Alabama, at Montgomery, Ala., has been appointed district passenger agent, with office at Montgomery.

Lewis C. Mahoney, chief clerk in charge of Interstate Commerce Commission matters in the general freight office of the

Chicago, Burlington & Quincy at Chicago, has been promoted to assistant general freight agent in charge of the same class of work, with headquarters at Chicago, effective October 12. Mr. Mahoney was born on April 10, 1876, and entered the service of the Burlington on November 1, 1906, as a clerk in the general freight office at Chicago. He was later promoted to tariff clerk and then to chief clerk in charge of J. C. C. matters.

Engineering and Rolling Stock

H. P. Meredith, master mechanic of the Maryland and Delaware divisions of the Philadelphia, Baltimore & Washington, at Wilmington, Del., has resigned to go into other business.

O. B. Schoenky, superintendent of shops of the Southern Pacific at Los Angeles, Cal., has been appointed master mechanic of the Tucson division, with office at Tucson, Ariz., vice W. C. Petersen, transferred.

L. Jutton, division engineer of the Chicago & North Western at Madison, Wis., has been transferred to the Wisconsin division, with headquarters at Chicago, vice S. S. Long, and F. W. Hillman succeeds Mr. Jutton as division engineer at Madison.

H. W. Wagner, district engineer of the Atchison, Topeka & Santa Fe at La Junta, Colo., has been promoted to chief engineer of the eastern lines, with headquarters at Topeka, Kan., succeeding R. A. Rutledge. Mr. Rutledge has been transferred to La Junta as district engineer on account of ill health.

H. A. Macbeth, division master mechanic of the New York, Chicago & St. Louis, at Conneaut, Ohio, has been appointed assistant superintendent of motive power, with headquarters at Cleveland, and T. W. Coe, master mechanic of the Indiana Harbor Belt at Gibson, Ind., has been appointed master mechanic of the Nickel Plate at Conneaut, succeeding Mr. Macbeth.

F. Hodapp, road foreman of engines of the Baltimore & Ohio, at Flora, Ill., has been appointed supervisor of locomotive operation, Southwest district, with headquarters at Cincinnati, Ohio; B. F. Crolley, supervisor of locomotive operation at Cincinnati, has been relieved of jurisdiction over Southwest district, to assume position as supervisor of locomotive operation on Northwest district, with headquarters at Cincinnati; T. B. Burgess has been appointed supervisor of locomotive operation of the West Virginia district, with headquarters at Wheeling, W. Va., vice T. K. Faherty, transferred; C. H. Creager, road foreman of engines at Cincinnati, succeeds Mr. Hodapp; J. M. Mendall has been appointed road foreman of engines, with office at Benwood Junction, W. Va., vice W. F. Ross, deceased; and J. G. Kircher has been appointed road foreman of engines, with office at Parkersburg, W. Va., vice E. J. Langhurst, transferred.

A. C. Deyerell, superintendent of motive power of the Great Northern, with headquarters at St. Paul, Minn., has been given entire jurisdiction over the mechanical department. R. D. Hawkins, superintendent of motive power at St. Paul with jurisdiction over part of the mechanical department, having been given an indefinite leave of absence to enter the Russian Railway Service Corps, William Kelly, assistant superintendent of motive power at Spokane, Wash., has been transferred to St. Paul. Henry Yoerg, mechanical engineer, has been appointed assistant superintendent of motive power, with headquarters at St. Paul. W. R. Wood, mechanical valuation engineer, has been appointed mechanical engineer, with office at St. Paul, in place of Mr. Yoerg. J. J. Dowling, master mechanic at Delta, Wash., has been appointed general master mechanic of the central district, with office at Great Falls, Mont., vice M. J. Flanigan, promoted, to superintendent at Whitefish, Mont. T. J. Clark, master mechanic at Spokane, has been appointed general master mechanic of the western district, with the same headquarters, succeeding William Kelly, promoted. All changes were effective October 20.

R. H. Pinkham, division engineer of the Renovo division of the Pennsylvania Railroad at Erie, Pa., has been appointed division engineer of the Pittsburgh division; John Atlee, supervisor of the Pittsburgh division at East Liberty, has been promoted to division engineer of the Renovo division; G. W. Snyder, principal assistant engineer of the Western Pennsylvania division at Pittsburgh, has been appointed assistant engineer of maintenance of way to succeed G. C. Koons; W. T. Covert, division engineer

of the Philadelphia Terminal division, has been promoted to principal assistant engineer of the Western Pennsylvania division, with office at Pittsburgh; C. E. Brinser, division engineer of the Middle division at Altoona, has been promoted to division engineer of the Philadelphia Terminal division; A. W. McClellan, division engineer of the Williamsport division at Williamsport, has been promoted to division engineer of the Middle division; Robert C. Faries, division engineer of the Elmira division at Elmira, N. Y., has been promoted to division engineer of the Williamsport division; C. M. Wisman, supervisor of the New York division at Trenton, N. Y., has been promoted to division engineer of the Elmira division; J. C. Hackenberg, division engineer of the Allegheny division at Oil City, Pa., has been promoted to division engineer of the Maryland division, with office at Wilmington, Del., to succeed Division Engineer J. R. McGraw, who was granted a leave of absence, and E. G. Nyars, supervisor of the Baltimore division at Bowie, Md., has been promoted to division engineer of the Allegheny division. Effective October 25.

Purchasing

A. L. Cochrane, general storekeeper of the Denver & Salt Lake at Denver, Colo., has been appointed purchasing agent and storekeeper, vice C. N. Davids, resigned.

H. A. Anderson, special agent in the purchasing department of the Pennsylvania Railroad at Philadelphia, Pa., has been promoted to assistant purchasing agent; B. P. Phillippe, coal agent in the purchasing department, has been promoted to assistant purchasing agent, and D. T. Jones, stationer, has been promoted to assistant to purchasing agent.

Railway Officers in Military Service

M. F. MacLaren, superintendent of the La Crosse division of the Chicago, Burlington & Quincy, at La Crosse, Wis., has joined the Russian Railway Service Corps.

George H. Emerson, general manager of the Great Northern at St. Paul, Minn., has been called by the Government to take charge of the Russian Railway Service corps.

R. D. Hawkins, superintendent of motive power of the Great Northern, at St. Paul, Minn., has been granted an indefinite leave of absence to enter the Russian Railway Service corps.

M. C. Kennedy, president of the Cumberland Valley at Chambersburg, Pa.; J. A. McCrea, general manager of the Long Island at New York, and the following officers of the Pennsylvania Railroad at Philadelphia, Pa., have been granted leave of absence in order to join the American expeditionary forces in Europe: H. C. Booz, assistant chief engineer; C. M. Bunting, controller; W. H. Farraday, assistant purchasing agent, and I. A. Miller, chief accountant in the general manager's office.

OBITUARY

L. D. Heusner, assistant general passenger agent of the Michigan Central at Detroit, Mich., died at his home in that city on October 17.

J. A. Williamson, district passenger agent of the Baltimore & Ohio at Toledo, Ohio, died at that city on October 15, as the result of an automobile accident.

E. E. Mote, manager of the Pacific Car Demurrage Bureau, died at his home in San Francisco, Cal., on October 19. Mr. Mote was one of the most prominent men in the demurrage field, in which field he began his work several years ago at Kansas City, Mo. He was president of the American Association of Demurrage Officers in 1912 and 1913. As the chief agent in the administration of demurrage affairs in California he has been influential in one of the most important recent reforms in freight car service, namely, the introduction and promotion of the high rate (\$6 per car per day for two years, 1909-1911, and \$3 since 1911), by which delays and misuse of cars have been greatly reduced. Only a few weeks ago he issued a circular appealing for efficiency under war conditions, and containing a strong argument against the use of the "average agreement" in charging for delays to freight cars. He cited statistics to support his contentions. He had the satisfaction of seeing the three-dollar rate put in effect in New Mexico last year, and later in Colorado.

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GENERAL NEWS SECTION

* Illustrated.

The attitude—affable or the opposite—in which a ticket seller or a conductor deals with a passenger may have an important effect in making friends—or enemies—for the road. This has been the substance of innumerable admonitions, by circular and otherwise, to trainmen and station men. The same principle applies also in the case of men “higher up.” The Springfield (Mass.) Republican of recent date says:

Pleasing the Public in Non-Essentials

“The Edison Company has been attacked at a hearing in Boston before the gas and electric commission on the charge that that company maintained an extensive lobby at the state house and the city hall. Whatever the facts in the Edison case, it can hardly be denied that railroad and other public service corporations employ a large amount of legal talent in getting their claims presented to public bodies. When certain citizens appeared recently before the Massachusetts Public Service Commission to ask for the restoration of certain train service on the Boston & Maine, the railroad's case was presented, not by a representative of the operating or the traffic department, but by a lawyer. Yet a simple and businesslike explanation of conditions from a railroad officer would probably have left a better impression on the petitioners than a lawyer's explanation of a matter in which no point of law was involved.”

The impressions made on people's minds constitute the whole text of the Republican's little editorial. Not a very large matter, surely; but is not the suggestion just as significant as that relating to the ticket seller? Not that the lawyer was not affable; very likely he was excessively so; but the mere fact that a man is a lawyer, whose meat and drink is polemics, may often be sufficient to produce the unfavorable impression to which our contemporary alludes. The lesson of this little incident is for the superintendent and the general passenger agent: make yourself so fully and thoroughly competent to represent your department before commissions and other public authorities or assemblies that the general manager will never think of calling in the legal department to speak for you. Or, to put it another way, consort so constantly with the gentlemen of the legal department that you can appropriate for yourself all their finest arts! It is no answer to this to say that superintendents are men of action, while lawyers are men of words; there is no law forbidding the superintendent to be skillful both in actions and in words.

Because of a typographical error the *Railway Age Gazette* said in its editorial, entitled “Now Comes the Real Tug of War,” which was published in last

The Increase in Locomotive Efficiency

week's issue, that in July the railways handled “almost 10 per cent more ton-miles with each freight locomotive than they did in July, 1916.” The statement should have been that they handled almost 19 per cent more ton-miles with each locomotive. This figure calls attention to the increases which have occurred recently in locomotive efficiency. The number of ton-miles handled with each freight locomotive in 1916 was over 26 per cent greater than in 1915; but the performance of 1916 has been far surpassed by that of 1917. The Railroads' War Board was organized in the early part of last April. In that month the ton mileage per locomotive was 13.3 per cent greater than in April, 1916. In May the increase in ton mileage per locomotive over the same month of the preceding year was 15½ per cent; in June, 21 per cent, and, as already indicated, in July, 19 per cent. These increases in ton mileage per locomotive have been partly due to increases in the number of tons handled per train and partly to increases in the number of miles made per locomotive per day. The increases in the trainload over that for the corresponding months of last year have ranged from 6½ to 11½ per cent. The increases in the average number of miles made per locomotive per day have not been relatively so large, but they have been of much importance. In the months of April, May, June and July, 1916, the average miles made per locomotive per day never exceeded 66 miles. In the same months of 1917 the average mileage per locomotive per day never was less than 68.8 miles, and in June it was 70.7 miles, and in May, 71.3 miles. The shipping public deserves much of the credit for the increases in the average loading per car, and of course these have contributed to the increases in the average trainload, but the railways deserve all of the credit for the greater efficiency represented by the increases in the average number of miles run by each locomotive daily.

RIDER ON COMMERCE ACT AMENDMENT PRODUCES RATE TANGLE

THE war has led to such a general application of the principle of governmental price-fixing that the popular assumption is that it is something new. As a matter of fact, the railroads have been subject to price-fixing by federal and state governments for the past ten years. During that time the rate scales and adjustments of years upon which the commercial prosperity of the country was founded have been attacked and dissected to such an extent that hardly a trace remains of the railroad rates which were in effect in 1907. With a few exceptions, such as the "five per cent" rate case, the trend of rates has been downward in the past decade. The difficulties of the railroads have been intensified by the conflicting activities of the federal and state regulatory bodies. The same testimony and the same expenses incurred by a hearing before one commission must be duplicated before another. Frequently, the decisions of different commissions are far apart with resultant inconsistencies in rates. In this regard, the "five per cent" case is typical. In 1914 the Interstate Commerce Commission granted advances in rates after an investigation extending over a period of several months. The Public Service Commission of Indiana has not yet permitted the rates to become effective on intrastate business.

The acme of repressive regulation was reached recently when a rider was attached to the bill increasing the size of the Interstate Commerce Commission, which prohibits any advance in freight rates until the reasonableness of such an advance has been first passed on by the commission. The result of this amendment has been to prevent the completion of certain readjustments of rates which actually had been begun, with the result of throwing many tariffs into a snarl that has caused some glaring examples of unfair discrimination between communities and shippers. The rate tangle which has been created will add months of work to the already crowded docket of the overburdened commission.

Illustrative of the complications resulting from the new amendment are the iron and steel rates between Youngstown, Ohio, and Chicago, and between Pittsburgh, Pa., and Chicago. There are at present two sets of rates in effect from Youngstown to Chicago, one of which is higher than the rates from Pittsburgh. This is due to the fact that certain railroads carry special tariffs on iron and steel from Pittsburgh and Youngstown, while other carriers publish class rates covering those articles. On September 20 all class rates were advanced in Official Classification territory and the roads issuing commodity tariffs covering iron and steel from Pittsburgh and Youngstown have been unable to raise these rates to conform with the class rate advance because of the present necessity of securing the approval of the Interstate Commerce Commission. Application for such permission was filed with the commission prior to September 20, but, up to the time of writing, it has not yet been acted upon, with the result that iron rates from the iron producing districts in central Ohio and western Pennsylvania are in a very chaotic condition.

There are many other examples of rate inconsistencies resulting from the legislation referred to. Petroleum rates from St. Louis and Peoria to Detroit, Cleveland and Pittsburgh have been advanced while Chicago rates to the same cities have remained unchanged. Rates on lumber from Chicago to Detroit, Cleveland and Pittsburgh have been advanced, but St. Louis rates to the same points have not changed. Under the law as it stood before it was amended, these inconsistencies would not have developed, since, unless the commission formally interfered, the railways could have gone ahead and finished the readjustments of rates on which they had begun.

The passage of the provision in question is an example

of the sort of ill-considered, half-baked regulation to which the railways have been subjected ever since the era of regulation was entered. The representatives of other classes of industrial concerns have stood by without interfering apparently on the theory that it was "not their funeral." Now, however, that other classes of industries are being subjected to regulation, men in other lines of business may become able to appreciate better what slap-dash regulation means and be more disposed to co-operate with the railways in trying to put a stop to it.

DISCIPLINE IN ITS MORE DIFFICULT ASPECTS

A RHODE ISLAND correspondent, in another column, discusses the three disasters to passengers recently prominent in the news. The main issue is simple, without regard to the details of the antecedents; all railroads, however high the quality of their forces, as a whole, must be alert to detect men who lack the health or the moral self-discipline to keep awake in the cab; and all must expect always to have a percentage of men who never had and never will have the courage to tell the whole truth about a collision, if their own vital interest seems to be at stake. (In fact it takes unusual grit to tell unpleasant facts in many situations where the issues are far less important than the loss of one's job or reputation.)

With these two most familiar faults—falling asleep on duty and telling lies, in extreme circumstances—we may consider also the reckless habit of neglecting regular sleep (going to a ball game or joining one's wife on a shopping excursion, when the rest period happens at a time favorable to those diversions) and the combination of poor judgment and a too-high estimate of the value of money which results in going on duty too soon after a serious sickness. All these faults are alike in that they cannot be dealt with directly. Firemen cannot be depended on to report a sleepy engineer. No inspector can follow men when they are off duty. Equivocators cannot be cured of their vice except as their moral natures are educated. We are here dealing with the most elusive of the human weaknesses which the trainmaster encounters in the performance of his educational functions; imperfections which no printed rules will touch. The problem is to do whatever is possible to get men into that frame of mind where they will not desire to do the wrong thing; or more accurately, where they will, with definite and intelligent purpose, desire to do the right thing.

If we review what we have learned in the past concerning the solution of this problem we shall find it pretty well summed up under two heads: (a) Keep up the training of all employees, even the experienced, so that none shall get rusty on the rules, and (b) see that, always, between the officer and the employees there is a *good understanding*. The first indicates *what* is aimed at and the second indicates *how*; or, rather, the *how* as it relates to the finishing touches. The first may seem to be so obvious and elementary as not to need mention; but is it not often true that unfamiliarity (not ignorance) as regards a simple rule is the first weakness found in an employee who has failed at some point? The second point, a good understanding, is the first and the most important practical element in esprit de corps (which we talk about in theory) actually carried out in a tangible way. Until the officer and the employee understand each other well enough to have some degree of actual sympathy, there can be but faint assurance that the employee has acquired a usable knowledge of the rules, much less an intelligent determination to carry them out. Incidentally, a good understanding is the only eradicator of the strike microbe.

And what we have learned in the past comes pretty near to being all that there is to be learned now. We have learned the lesson but we have not learned it well enough. This article is not designed to bring out any new lessons, but to

call attention to old ones. If we were to go into details we might make the same mistake that is so often made in actual life in the railroad office; keep the attention too closely riveted on the elementary branches of the subject. The most direct injunction that the superintendent or trainmaster can take to himself in this matter is to put a hundred per cent more energy into the same kind of work that he is already doing. In that way he may carry himself and his pupils above the primary class, and broaden both the pupils and himself.

There is, however, one new suggestion; it is found in the brief address of C. H. Baltzell, a superintendent of the St. Louis-San Francisco, before the National Safety Council in New York City last month (*Railway Age Gazette*, September 21, page 521). Speaking of the safety-first propaganda as applied to men in train, yard and switching service, he said that it was a good thing to encourage athletics among these men, as a recreation; for the reason that the man who practices athletics is much more alert to take care of himself and avoid bodily injury in his everyday work. Why not adapt this advice to mental as well as physical work and recreation? Men who exercise their minds when off duty, in recreation or otherwise, will exercise them with better skill and effect when on duty.

RAILWAY MAIL PAY

IN a formal statement filed with the Interstate Commerce Commission early in March the Postmaster General stated that under the space basis of compensating the railways for carrying the mails, put in effect on November 1, 1916, and the tentative rates put in effect at the same time, the total compensation of the railways was \$3,225,405 a year greater than it would have been under the weight basis and rates previously applied. Similar information was imparted to the public in a press statement given out by the Post Office Department about the same time. Since then, however, something has happened to the \$3,000,000. It does not show up in the latest reports of railway earnings and expenses. Incidentally, the reasons why it does not may serve to explain why mail is sometimes received less promptly than formerly.

The Interstate Commerce Commission gave out the other day its usual monthly statement of railway earnings and expenses for the month of July and seven months of the calendar year. This showed very large increases in the revenues received by the railways for the transportation of freight, passengers, express and "all other transportation"—together with corresponding increases in all items of expense—but the revenues from mail traffic for the month showed a decrease from \$5,052,461 in July, 1916, to \$4,836,825 in July, 1917, or from \$22 to \$21 per mile. For the seven months the mail revenue was \$35,476,220 as compared with \$35,197,712 in 1916. This is an increase of \$278,000 or only from \$153 to \$154 per mile. Freight revenue per mile had increased from \$6,172 to \$6,900; passenger revenue from \$1,675 to \$1,877; express revenue from \$215 to \$259, and revenue from all other transportation from \$259 to \$278. Has all this increased volume of business been carried on without an increase in the amount of mail correspondence? Has the boasted parcel post failed to keep pace with the increases in other kinds of transportation? Perish the thought! For the calendar year 1916 the railways' revenues from mail pay were \$265 per mile as compared with only \$255 in 1915. Up to March of this year they still showed an increase. Something has happened since that time with the result that for seven months of the year the railways had actually received only \$278,000 out of the promised \$3,200,000 increase.

As a matter of fact, it has been promised ever since 1914, when the joint congressional committee, which recommended

the space basis of payment and the rates which went into effect tentatively last November, estimated that they would increase the railways' compensation by about \$3,000,000 a year. The railways have always been suspicious of the estimate, and have protested that the rates were too low, while the Postmaster General has asked the Interstate Commerce Commission to reduce them on the ground that they allow the roads to earn too much money.

What has happened to the \$3,000,000 has been exactly what the roads foresaw. In fact, some of the advocates of the law themselves had felt called upon to explain the joker to their colleagues in defending themselves against charges of too great liberality to the railroads. Formerly the railroads were paid for carrying the mail on the basis of weight, just as the post office department itself receives its pay on the weight basis. Under the space basis, so long advocated by the department, it pays the roads so much per car for each mile the car is hauled and has the privilege of putting as much mail in a car as it can get in. The railroads cannot object to this; it is exactly in accordance with their campaign to induce shippers to load freight cars to capacity. The difficulty is in the question of rates. The rates now applied were based on the former average loading of about 3 tons to a car, while the maximum capacity of a car ranges up to 20 tons. In other words, the post office department proposed, and got Congress to approve tentatively, a plan whereby it pays the railroads per car mile about what it used to pay for a 3-ton car, and then proceeds to take the mail out of two or three cars or trains and load it into one. This was explained by Representative Moon in the debate in the House on February 8, 1916, in the following language:

"But, you may ask me, if it is costing more by three or four million dollars, in the first place, to go to the space basis than to remain on the weight basis, why should we make the change? My answer is . . . your department can handle the cars in which they pay for the space and can so adjust the loading and unloading and the transportation as to recoup within a year or two every dollar that is lost by the change in the basis of compensation from weight to space."

The department has apparently arranged matters so that it can recoup even before the first year is up. The new plan had been in effect but a short time when the department issued its statement to the press that it was paying the railways at a higher rate per year than before, and for a time the railway mail revenues showed a slight increase. But this was not for long. A general readjustment of mail service was undertaken. Mail formerly handled in two cars on two trains was "consolidated" into one car on one train. On some trains the space formerly used by mail clerks to sort the mail en route became too valuable to be used for that purpose. The clerks were taken off, the space was filled with mail formerly carried on an earlier train and the sorting was done after arrival at the terminals. This reduced the expenses of the department and the revenues of the railways but it also delayed the mails. People who now receive letters on the second delivery that formerly arrived the first thing in the morning should not jump to hasty conclusions that the delay is caused entirely by the fact that the railways are hauling so many troops and so much government freight.

Undoubtedly, the heavier loading of mail cars possesses some compensating advantages to the railways. It is cheaper to haul one car loaded with 10 tons of mail than two cars holding 5 tons each. Moreover the entire question of mail pay rates is now before the Interstate Commerce Commission for determination, elaborate statistics are being gathered by both the roads and the department to aid it in its decision, and whatever rates the commission finds just and reasonable will be made retroactive.

The point is that the post office department has tried to

make the public think it has increased the railway mail pay when in fact it has reduced it, for no one believes that the volume of mail carried is not greater than it was last year.

Possibly the statement that the roads were being paid more was intended to soothe the considerable element that believes that railway mail rates have always been too low, while the effort to reduce the rates is for the benefit of the class, which probably includes more voters, that believes otherwise or that does not care whether the railroads are treated fairly.

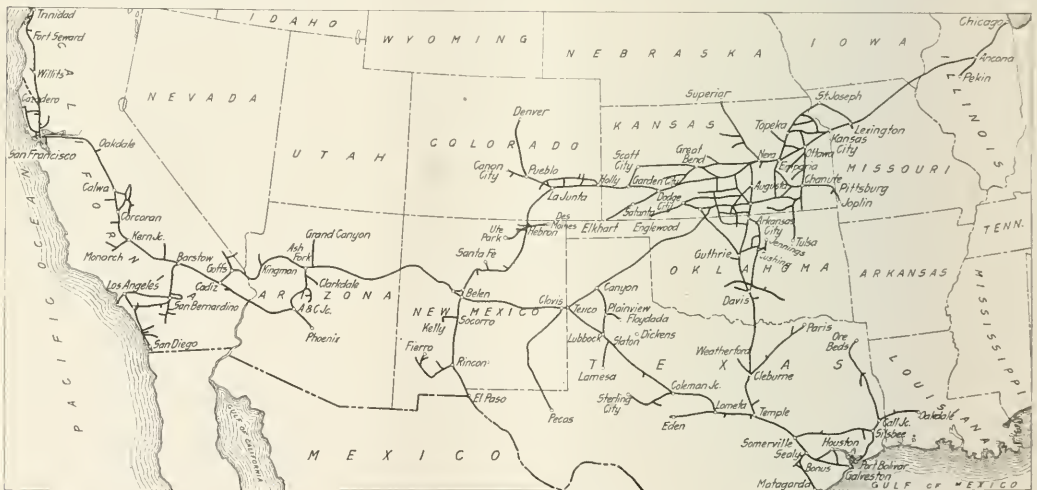
ATCHISON, TOPEKA & SANTA FE

THE amount required to pay interest on all of the outstanding bonds of the Atchison, Topeka & Santa Fe was less in the fiscal year ended June 30, 1917, by approximately half a million dollars than the amount required to pay the interest on the bonds outstanding 10 years before. In 1908 the interest requirements were \$12,579,000; in 1917, \$12,113,000. Since 1908 the Atchison has invested \$169,407,000 in additions, betterments and extensions, this being on top of an investment in railroad property of \$577,433,000 made prior to June 30, 1908. As an example of conservative financing, this is almost unique in American

The causes and conditions which have permitted increased investment to be followed by more than a proportionate increase in net available for profit on investment, and the manner in which new capital was raised for investment, although related both in their results and in their causes, should be studied separately.

The fiscal year ended June 30, 1917, was a record year both in gross and net earnings for the Atchison, Topeka & Santa Fe. Gross totaled \$159,627,000, comparing with \$137,070,000 earned in 1916, which year itself was far and away better than any previous year. Net available for interest and dividends was \$51,789,000, comparing with \$45,132,000 in 1916, which year again was better, as far as net was concerned, than any previous year in the company's history. In other words, up to June 30, 1917, the Atchison had not ceased to enjoy the full effects of the law of increasing returns on railroad investment which the majority of American railroads felt up to 1907 and which up to that time was generally considered as characteristic of well managed roads in this growing country.

In 1917 freight revenue amounted to \$111,809,000, an increase of \$20,377,000. Passenger revenue amounted to \$32,770,000, an increase of \$1,201,000. The Atchison in 1917 operated 11,270 miles of road, so that the average gross



The Atchison, Topeka & Santa Fe

railroad history. But even more remarkable is the fact that whereas so many roads have felt the law of decreasing returns during these 10 years and that the average return on all railroad investment during this time has been on the downward trend, the net on the Santa Fe has shown an increasing ratio of percentage earned on investment. Notwithstanding the enormous increase in investment, the great increase in rate of wages and cost of materials, and in fact of all costs of doing business, the Atchison earned net available for interest and dividends totaling \$51,789,000 in 1917, or at the rate of 6.93 per cent interest on its total property investment. Each of these two facts—the conservatism of its financing and its increase in earning power more than commensurate with the increase in investment—has a most important bearing on the value of Atchison stock as an investment; but in studying the economic aspects of the development of the property in their relation to the economics of railroad operation and development in general in this country, the two must be kept entirely separate and distinct.

revenue per mile of road was \$13,858. With an increase of \$22,417,000 in total revenue over 1916 there was an increase of \$12,603,000 in expenses, the total expenses in 1917 being \$96,334,000. Maintenance of way expenses were slightly less in 1917 than in 1916, due in part to the extraordinarily heavy maintenance expenses of 1916 necessitated by the Galveston flood, and in part by the scarcity of labor which necessarily limited maintenance expenditures. Maintenance of equipment cost \$25,273,000 in 1917, an increase of \$4,758,000 over the previous year. Apparently every effort was made to keep the same standard of maintenance of equipment as that adhered to in previous years and the increase in expenses represents the increased cost of material and of labor.

Transportation expenses amounted to \$45,911,000, an increase of \$7,629,000. Notwithstanding the fact that the second half of 1917 reflects the increased wages necessitated by the so-called eight-hour law and the great increase in fuel prices—both coal and oil—which have taken place, the

ratio of transportation expenses (the out of pocket cost of doing the business) to gross operating revenues has increased only slightly—from over 28 per cent to approximately 29 per cent. A ratio of transportation expenses to gross revenues of less than 30 per cent in these times of high labor costs and high material prices is truly remarkable. Adequate facilities, an adequate organization and a very efficient use of facilities are in general the explanation of this striking showing. The Atchison serves a country which has grown in population and in prosperity very rapidly. The railroad has expanded both extensively and intensively at a rate which has continuously kept facilities well ahead of the requirements placed upon them.

The policy pursued by the Atchison management and that pursued by the Pennsylvania Railroad are founded on the same principle. Both managements have attempted to develop their property with an eye to many years in the future. Pennsylvania was met with obstacles in the way of procuring additional terminal facilities, etc., that made its problem quite different from that of the Atchison. The phenomenal success of the Atchison must be attributed in great part to the accuracy with which President Ripley and his directors forecast the trend of the development of the country and the skill, foresight and effectiveness with which the railroad property was developed to conform with these forecasts. When compared with the mistakes that have been made in extensions and developments of some of the other southwestern roads the precision with which the Atchison built or bought new lines, added to its facilities here, built double track there, etc., seems almost uncanny.

The conservative and sound policy of financing which was pursued would have been impossible without the success of the management in developing new business and handling it at a cost which showed steadily increasing profits. On the other hand, it would have been easy to have pursued a different financial policy, and a full realization should be had of how important it is that the Atchison financed its constantly and rapidly growing needs through the sale of stock or convertible bonds, which in large part have been converted into stock, and through the expenditure of surplus belonging to the stockholders. In 1908 there was \$217,130,000 stock outstanding and \$315,454,000 funded debt outstanding. At the end of 1917 there was \$343,822,000 stock and \$288,809,000 bonds outstanding.

The Atchison is today, in credit and in cash resources, in a most enviable position. There are no loans and bills payable. Cash on hand amounted on June 30, 1917, to \$37,788,000, and time deposits to \$1,260,000. Materials and supplies, which are inventoried not at their present value but at their original cost, which was much lower than the present value, totaled \$18,981,000.

Is there a sign of a turn in the tide of affairs of the Atchison, Topeka & Santa Fe in its annual report for 1917? That is a question of vital importance and yet one which is quite impossible of authoritative answer. In 1908, with which year certain comparisons in these remarks have already been made, there was a quite startling drop in net available for interest and dividends, and 1907, the year previous, had been a year of great prosperity. Could anyone in 1907 have predicted the 1908 results? Could anyone in 1908 have predicted the results of the next ten years? The answer to the first question is comparatively easy. There were many people as far back as 1906 who foresaw the trend of general conditions and the management of the Atchison itself in 1907 was preparing quite effectively for the great depression which took place in business during that and the following year.

The answer to the second question cannot be definite, but the fact is that the Atchison went on with its program of improvements. There is no evidence now, in going back over the annual reports of the company, that President

Ripley lost faith in the future of his company or faltered in his program of keeping facilities ahead of the requirements thereof. On the other hand, it is almost impossible to calmly study present railroad conditions and not feel that even the Atchison cannot go on long showing increasing margin of safety to investors or even a continued margin of safety unless there is a change in general conditions. It may well be that 1917 is not the culmination of the history of the road. It may be that it is a high peak which will be succeeded by depressions and other high peaks, but it is difficult to see how certain general and fundamental conditions which are affecting other railroads can be for an indefinite length of time fended off by the Atchison, Topeka & Santa Fe.

Take the question of taxes alone. President Ripley estimates that it is probable that they will be \$12,000,000 for the calendar year 1917. In the fiscal year ended June 30, 1917, taxes amounted to \$9,871,000. In the previous fiscal year they amounted to \$6,210,000. In recent years they have averaged less than \$6,000,000. Here is an increase of 100 per cent. The increases in wage costs vary, and are not, of course, anywhere near 100 per cent, but on the other hand they are great enough so that it is almost inconceivable that a large enough gain in business can be handled with a small enough increase in number of employees to offset this higher cost, nor is it easily conceivable that heavier train loading, better car loading, greater number of miles per car per day and more effective use of facilities can at the present rate of increased costs offset the higher prices for materials. It is said of the late E. H. Harriman that he could see the downward trend of events, and of railroad prosperity in particular, after 1906 as clearly as anyone, but that he remained an optimist because of his entire confidence in his own ability to meet any conditions which might arise. It may be that Mr. Ripley and the Atchison are such strong swimmers that a tide which may bring disaster to the majority of railroads can be successfully breasted, but such a belief, notwithstanding the truly wonderful showing of the Atchison in 1917, must be founded on faith rather than on substantial evidence.

The following table shows the principal figures for operation in the fiscal year 1917 compared with 1916:

	1917	1916
Average mileage operated.....	11,270	11,247
Freight revenue.....	\$111,809,085	\$91,432,429
Passenger revenue.....	32,770,085	31,568,601
Total operating revenues.....	156,179,121	133,762,392
Insurance of way and structures.....	19,119,336	19,518,635
Maintenance of equipment.....	25,273,169	20,514,960
Traffic expenses.....	2,780,823	2,755,736
Transportation expenses.....	45,910,505	38,281,054
General expenses.....	3,494,122	2,904,040
Total operating expenses.....	96,333,569	83,730,960
Taxes.....	9,870,634	6,210,366
Operating income.....	49,951,675	43,779,993
Gross income.....	53,399,966	47,087,123
Net income.....	39,209,073	32,579,735
Dividends.....	19,250,325	18,690,965
Appropriated for additions and betterments.....	19,875,211	7,000,000

NEW BOOKS

Railway Connections and Junction Points. By R. H. Gray. 341 pages, 4 in. x 6 3/4 in. Bound in paper. Published by H. K. Cammann, 24 Market Place, Baltimore, Md. Price \$1.50.

This little handbook shows, in compact form, the passenger and freight connections of about 150 of the principal railroads of the country, symbols being used to aid the reader in quickly distinguishing between freight and passenger connections; between places where there is a track connection and those where there is none, and to show other data. The book is printed in rather small type, but even at that the New York Central's connections fill more than seven pages. The Central connects with the Lehigh Valley, for example, at 22 places; with the Wabash at 18, and the Pere Marquette at 11, etc. The Seaboard Air Line connects with the Atlantic Coast Line at 63 places. The Southern, the Southern Pacific and other large roads show equally ponderous lists.

The Chicago & North Western and the Chicago, Milwaukee & St. Paul probably take the medal; the stations of these roads are in neighborly (or unneighborly) juxtaposition at no less than 123 places. These are all shown, in alphabetical arrangement, under each of the two roads.

Locomotive Handbook. Compiled by the American Locomotive Company. Bound in leather, 195 pages, 3½ in. by 6 in. Published by the American Locomotive Company, 30 Church street, New York. Price 75 cents.

The locomotive designer has always felt the need of a compact and concise source of information on the fundamentals of locomotive design for ready reference. The American Locomotive Company has done much to supply this need in this Locomotive Handbook which has just been published. Heretofore the locomotive designer has been compelled to refer to material published in various places to get the information he desired on locomotive design, or else possibly to refer to rather cumbersome notes compiled by himself. The Locomotive Handbook will, therefore, fill a real need.

The book opens with a brief description of the American Locomotive Company. This corporation has a full working capacity of 3,000 locomotives per year and employs 20,000 men. This is followed by formulas and tables giving the tractive effort of both simple and compound locomotives. The next subject considered is Train Resistance, the material being contributed by F. J. Cole, chief consulting engineer of the American Locomotive Company. It includes data on the resistance of freight and passenger cars of different weights and at different speeds, together with information showing how the results of tests check with the values given in the handbook. A comparison of the resistance of four and six wheel trucks is made and interesting information is included regarding the effect of a stop in increasing resistance. All phases of the subject are considered, such as velocity grades, acceleration, weather conditions, track resistance, etc.

About eighteen pages are devoted to the subject of locomotive ratios; this was also written by Mr. Cole and is based substantially on bulletin 1017 issued in January, 1914, by the American Locomotive Company. Illustrative examples are given to show how the information given under this head is to be used. Both saturated and superheated steam locomotives are considered. Following this is a section of about eight pages which gives the efficiency of longitudinal seams, stresses in staybolts and crown stays, method of bracing the back head and front tube sheet, the shearing stresses on rivets, etc.

Valuable information is also given on counterbalancing and fuel oil, the counterbalancing information being taken from the 1915 proceedings of the American Railway Master Mechanics' Association. Ten pages are devoted to the federal rules on locomotive inspection and testing.

The balance of the handbook contains methods used by the American Locomotive Company in the design of axles, crank pins, frames, piston rods, helical springs, elliptical springs, location of gage cocks for various grades over which the locomotive operates, piston thrust, etc. Information in tabular form is also given regarding the proper pressures for mounting wheels and piston rods. Several tables are included showing the effective area of staybolts, the proper location of tires on driving wheels, standard U. S. screw threads, properties of saturated and superheated steam pipe threads, wire and sheet metal gages, moduli of rectangular and circular sections, decimal equivalents, speed-second table, tangent deflections, metric unit and U. S. equivalent tables, etc. Information is also given regarding valve setting, including instructions for setting the Walschaert valve gear.

Much time and a great deal of time have been exerted in the compilation of the information published in this book and it will be of considerable assistance to railroad men interested in locomotive design.

Letters to the Editor

THE WEARY AND THE UNTRUTHFUL

PROVIDENCE, R. I.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The North Branford (Conn.) collision of trolley cars has a lesson for us, has it not?

The report of the Connecticut Utilities Commission on this collision, which has recently been issued,* discloses a good deal of loose practice; irregular working hours, weak or worthless supervision, and absence of necessary rules. The natural comment of the steam-railroad man will be that this collision has no lessons for him; but is this so certain? The steam roads do, indeed, have the 16-hour law to restrain them, and the stern logic of costly collisions in the past has taught them the need of constant and vigilant supervision of all train operations; but the spirit of the 16-hour law is often violated by them now, the same as in former years; and many superintendents, probably the great majority, have to confess (to themselves) that the actual supervision of the personnel on their division is far below their ideals.

The steam-road officer who allows men habitually to work as close to the 16-hour limit as is practicable may not be very different, judged by final results, from the trolley-road officer who works men up to a limit fixed by himself; for, from the standpoint of the supervising officer, 16 hours is a very long day. (This is not saying that it is always dangerous for men to be on duty for that length of time. For the individual, in a particular instance, it may or it may not be excessively long. In countless thousands of cases, trainmen in good health and with the proper spirit, working under favorable conditions, have remained on duty, running trains at moderate speeds, for 16 hours, with no bad results.) And, disregarding, for the moment, all rules and technicalities, we have in this North Branford case two conditions which must be dealt with everywhere: (a) men who go on duty when tired in body, or absorbed, mentally, in something outside their work; and (b) men whose explanations of their dereliction, after the event, are of such character that everybody doubts or denies their truth. In the cold but convincing phrase of the old-time superintendent, saddened as he is by experience, men of all kinds will try to lie out of a bad scrape. Or, in more refined language, many men in all classes are found to lack the courage to tell the truth about their own delinquencies.

Very bad collisions have not been so frequent of late; and, if constant agitation of railroad dangers is the only way of keeping railroad superintendents and trainmen fully alert, it may be that we are not now as alert as we should be; but I need not remind your readers that the lessons are still needed. Even while we read of this trolley collision we have the report of a rear collision at Earlville, Illinois, September 16, where the engineman was asleep. Seven passengers were killed. Does not this require the application in steam road service of the most searching lesson of the North Branford case? Again, Kellyville, Oklahoma, with 25 killed (September 28), would seem to illustrate deficient discipline and education as poignantly as the sleeping trolley conductor at North Branford.

WHATCHEER.

FAST TRAIN RUN IN IRELAND.—On the conclusion of the visit to Cork of the Irish Convention a special train was run from that city to Dublin, which covered the 170 miles in 174 minutes, including a stop of ten minutes at Mallow.

*See *Railway Age Gazette*, October 12, page 656.

A Study of the Car Interchange Situation

Empty Mileage and Proper Maintenance Important Factors in Distribution Plan. Standard Designs Necessary

By Samuel G. Thomson*

THE various codes for car service and interchange rules which appeared in the issue of the *Railway Age Gazette* of August 17, page 279, and which were part of a contest for the best suggestions for a new code, are valuable contributions to this subject and contain much material for further thought. This subject involves the most important transportation problems before the railroads today, and should be kept alive by the active discussion of just such men as have contributed to this contest, in order that all may have the benefit of the other fellow's view. Every railroad in the country should have men in their organizations who are studying the broader use of our railroad car equipment, in addition to their own local transportation problems and the interchange of cars with their immediate neighbors.

Without attempting to review the various details of the above mentioned codes, let us consider whether they embody the correct principles, for it is along this line that present discussion should be encouraged; since the formulation of details will be of no avail until the principles are first clearly established and mutually agreed upon.

HOW MANY CARS SHOULD A RAILROAD OWN?

Each railroad should find it profitable to own, with a reasonable margin of safety, sufficient cars of each kind to take care of the normal business which originates and is distributed on its lines, and also to contribute its fair share of cars to its usual joint business over through or distant routes. With this number of cars, each railroad could do its share in the transportation service of the country and would take care of the normal demands throughout the year during periods of normal business activity. But we must provide for the periods of unusual stress and extra seasonable rushes of traffic. To meet this, we may ask whether efficiency and economy would not best be served by combining the service of like kinds of equipment of several roads some of which might otherwise be idle, rather than require each railroad to own sufficient cars to meet their extra service. The answer would seem to be in the affirmative, which means that railroads should own sufficient cars for average rather than for excess needs. This refers to a class of cars for certain uses or to the railroad's total car equipment.

Car Quota Plan.—The quota is used as a basis for car distribution by all of the codes referred to above except the joint-ownership plan of Mr. Smith. The following question then suggests itself: Is the need for transportation on a given railroad equal at all times to the supply afforded by the cars a railroad should own? The car quota advocates infer by their arguments an affirmative answer to this question, since they make it easy for the railroads to maintain their quota of cars and make it hard for them to do anything else, thus assuming that the quota corresponds to transportation needs at all times. The conclusion of the previous paragraph answers: "No," to this question—i.e. that the needs for transportation are not constant, and that the railroad's quota is a supply of home and foreign cars suitable to meet the general average of their needs, rather than their variable needs.

Will actual conditions shed any light on this subject?

Some railroads own many more cars than their share, while others fall far short. However, let us consider the average railroad where the number of cars owned, or its quota, closely approximates the average number of cars to be found on its lines during the year or over a period of years. Will we not find on this railroad that the quota is not so directly related to the number of cars which it actually has on its lines during the various seasons of the year? This relation of quota to needs is also complicated by the nature of the road—whether it is a terminal or a distributing railroad, a through trunk line or an originating feeder line. Does it not seem, then, that our car distribution system should encourage flexible variation to meet the seasonable requirements rather than lay down certain regulations which will have a tendency at least to maintain artificially at all times a given number of cars? We also find that during the longer periods when cars are in great demand the quota supply does not meet the needs, and that under normal conditions and during slack times the railroad manager is not so much interested in having the use of his quota or even his own cars, particularly if another road could use some of his allotment to better advantage and if the adjustment would produce unnecessary empty mileage. If, then, the average need for transportation over a year or a number of years, being approximately constant, does not meet the varying seasonable demands or even periodic changes, it would seem that the quota should not be the basis for a code of car-service rules, particularly with railroads which have a large portion of their cars going off their lines.

The quota basis for car distribution assumes that car ownership be disregarded. The intent of this plan might be to include as much recognition of ownership as possible in making adjustments, but in practice the result would mean a wide dissipation of cars from their owners, and the return of owner's cars would become almost negligible, since adjustments are intended to be made with any cars which may be most easily obtained. The automatic tendency to maintain the quota of cars would also cause considerable unnecessary empty mileage which the plan is intended to prevent.

It is, of course, generally recognized that each railroad is entitled to the possession of cars equal to its ownership; but may we not add a proviso and have it read: A railroad is entitled to the use of the number of cars equal to its ownership, if it is not to be equitably compensated for its own cars when used by others. Is not then the quota argument a question of justice rather than a plan for furnishing a proper car supply, and is not the answer: To eliminate the question of rights by arranging for proper compensation—rather than to add complication by trying to adjust the operation and distribution of the cars to meet these rights? Does not this question of quota disappear altogether, if some plan were devised to compensate each railroad manager equitably for that part of his own cars which he must loan to the other fellow, i.e., so that he would profit just as much from them as if he were permitted to use them himself? It is true that, in times of stress, a railroad's quota and perhaps more would be needed in order to take care of the business demands, which is the desire of every executive. But this satisfying of the transportation needs is hardly a matter of the rights of ownership; so that perhaps the quota is not a good measure of the necessities of the situa-

* Mr. Thomson was formerly superintendent of motive power and rolling equipment of the Philadelphia & Reading. This article is a continuation of his discussion on this subject which appeared in the *Railway Age Gazette* of July 20, page 109.

tion, since the stress might better be relieved by the combined quotas of several railroads through the agency of a central distributing bureau, which will be required in any event and with any system. Such a bureau or central committee probably would meet emergencies by entirely disregarding the quota plan, and in making seasonable adjustments might find itself acting more often in opposition to the quota regulations than with them.

We see, then, that the quota plan is rather a question of rights of ownership than a basis for car service; also, that it is not a good measure of the variable seasonable needs, that it would have a strong tendency toward the separation of the car and its owner, and would cause some unnecessary empty mileage, all of which features would be objectionable in any new system that may be evolved.

EMPTY CAR MILEAGE

Empty car mileage is a tremendously costly factor in railroad operation, and the illisiveness of this problem is ably brought out by J. L. Payne, comptroller of statistics of the Canadian railways, in the August 31 issue of the *Railway Age Gazette* on page 383. In this article he shows how difficult it is to locate any important factor which directly affects the periodic variations in the percentage of empty-car mileage to total mileage. His figures indicate that these variations are not due to changes in the volume of traffic, to the size of the train-load or car-load, to the varying conditions on different railroads, or to long and short hauls. However, regardless of the difficulties, we all agree that this empty-mileage incubus, which, like the poor, we must always have with us, is one of the fundamental operating problems to be improved in the development of our car-service and interchange rules. A thorough study of it may help us to evolve a code which will reduce empty-car mileage to a minimum.

Effect of Car-Supply on Empty Mileage.—This phase of the problem was not included in Mr. Payne's analysis; but perhaps a study of the resultant effect of owning an extra amount of equipment above normal demands, and its opposite—the effect of operating with a very close margin or with a shortage of equipment—might reveal a close relation between car-supply and empty-car mileage.

It is evident that the smaller the margin of cars with which a railroad can efficiently meet its traffic conditions, the greater will be the return on the capital invested in equipment; but this is not all of the story. We must also consider whether or not a certain increase in equipment would help the service, and what the net financial result would be in owning a larger number of cars, which in turn might be found to reduce operating expenses by reducing empty-mileage. This phase of the subject must be approached from a country-wide viewpoint, since it is obvious that scattered local increases in car equipment might not perceptibly affect the empty mileage in the respective districts, whereas the result of all railroads operating with an increased quota of cars might be appreciable. We know that a general increase in equipment beyond normal requirements, with properly controlled distribution, would not at least increase empty-car mileage, and usually would result in always having more cars "to move toward home under load." As a general proposition then, except in so far as congestion and limited track facilities affect car distribution, an increase of available cars might be found to be effective in diminishing empty mileage.

We may assume that there is an exact number of cars for each road which would give the best operating and economic results, including in this calculation the car's earning power and the cost of handling it empty, as well as the cost for interest, repairs, and depreciation. If the above inference holds true—that more cars might result in less

empty car mileage—then it would be interesting in this connection to consider or attempt to estimate just where an increase in equipment above normal requirements would reach a point where the total of the interest on the investment of the extra cars, the cost of maintenance, depreciation, etc., would over-balance the savings realized by not having so many empty cars to handle. This might be a good subject for a committee of the American Railway Association, and they might take as their first investigation: The present cost of handling empty-cars, without any reference to the effect of increases.

Some might say that these figures would be estimates only, and that the problem is too involved to be worth the effort. In view, however, of the fundamental importance of the empty-car as a transportation problem, this hardly will be accepted as an answer, and the railroads should take upon themselves the responsibility of determining their present empty-car mileage costs as accurately as possible, even if they do not wish to go further and include the effect of equipment increases on empty mileage. In such a study it would be possible to approximate from the transportation and maintenance accounts, with possibly the addition of some supplementary statistics, a very close estimate of the actual expense involved in the handling of empty cars. These figures would be most interesting if brought down to the point where the railroad manager could accept them as very closely representing actual conditions. It may be desirable to postpone the investigation of the effect of increases in equipment until our car-service and interchange system becomes more settled, since the requirements for each railroad and the resultant effect of their co-operation is dependent upon whether we have a system of interchange with railroad ownership as a basis, a general pooling system, an independent corporation ownership or some intermediate compromise.

Convertible Cars.—Convertible types of car, and the adaptation of the usual kinds to other than their regular uses are kindred subjects which enter here as important factors in decreasing empty mileage and consequently in making car service more efficient. The desirability for progress along these lines needs no argument, and it only requires to be kept constantly in the minds of railroad managers, in order that they may have harmonious and continuous co-operation between their mechanical and transportation departments so as to develop equipment which will most economically meet service requirements.

Operating Maxims, Antidotes for Empty-Car Mileage.—"Move cars toward home under load" is, of course, an ideal maxim to keep before us at all times and under all conditions. This will accomplish wonders in eliminating empty mileage; and it infers that the car has a home. Unfortunately, however, the origin and the distribution of traffic on each railroad and throughout the country only permits of partial application of this rule. However, it always should be a guiding principle. We might add to this rule the following as a corollary: "Move cars away from home under load rather than toward home empty." This should apply when the handling road is not in the same community as, or does not have a direct connection with, the owner of the car; but it would first require that the various railroads have in service a good proportion of cars of the same design and with interchangeable repair parts. This latter requirement is worthy of careful thought.

STANDARDIZATION

The distribution of cars regardless of ownership is a most desirable method of operation—if it does not involve over-balancing serious difficulties. It could be accomplished more satisfactorily, and the various shops throughout the country would soon be better able to repair any car which comes along, if the railroads among themselves

were more favorably disposed toward a general standardization of equipment and were making more actual progress toward that end. This is the direction in which we must look for practicable development such as will permit a disregard of ownership without greatly increasing repair costs, and also attain the advantages of reducing empty-car mileage by a more flexible use of cars.

This may sound revolutionary to our old way of thinking. Yes, but these are radically changing times. It is quite possible and entirely practical for a few of the larger railroads to make a start in this direction. The movement only needs leadership. The fundamentals of railroad mechanics and operation are quite similar the country over, and there is not the necessity that many are wont to believe for the existing wide diversity of practices and designs to meet varying conditions. Improvements can be developed, competition encouraged and individuality fostered by the "one-design" plan. It means co-operative use of well-proved practice, the result of which will be less diversity and less frequent changes.

The following is pertinent from the New York Sun: "An airplane man in the financial district was asked why, with all their resources, England, France and Italy together had so far been unable to do more than hold even with Germany in the air, and were waiting for the United States to clinch supremacy. His answer, in view of the Liberty motor, may be interesting. His opinion was that Germany is second only to the United States in learning how to standardize, and this, with remarkable resourcefulness and skill in repairing every machine, no matter how badly smashed, that falls within her lines, had enabled her so far to hold her end up."

How about the freight car that "falls" on our railroad lines? Are the railroads living up to the reputation we have gained in other fields of activity? The pooling of ideas has built up the motor industry, and the war has given the "standardization plan" a wonderful impetus in the construction of the craft that are to travel under and on the seas and through the air. Why not standardized freight cars on land? If our railroad men will accept the thought that in interchange, "common cars" means "common design," this soon would be accomplished, and the government will have no incentive to buy standard cars or to order adherence to uniform plans and specifications.

The M. C. B. Association has accomplished much in developing some generally used standards, and the American Railway Association actually has built a few sample cars, but there must be more of a general movement among the railroads toward the putting into actual operation of several types of standardized cars of the same design with completely interchangeable repair-parts, before we are able to consider as an economical method of operation any of the schemes involving the disregard of railroad ownership and "country-wide repairs" of cars. Government ownership or joint-ownership by an independent corporation would have an excellent feature in bringing about a very rapid adoption of the standardization of cars throughout the country. But the railroads can own the cars themselves and accomplish the same thing—if they will.

CAR REPAIRS

The plan for common ownership of cars by an independent corporation, as suggested by Mr. Smith, in the above mentioned article, has one great objection, in that it removes the incentive for proper maintenance which is always present under a system where the one who uses and repairs the car also owns it. It would seem therefore that an independent corporation ownership, and even a general pooling arrangement of any kind which disregards railroad ownership, is a step in the wrong direction as far as proper maintenance is concerned; also that any code

of rules which is formulated to embrace the proper handling, use and distribution of the cars without giving due consideration to the conditions which will result in the best maintenance will fall far short of the mark.

All of the suggested codes, except the one by Mr. Fisher, disregard the ownership of cars, or make it secondary in their plans for distribution. The above argument, then would also seem to be pertinent to them. Any plan for interchange which has a tendency to render the cars "homeless for repairs" will be a step in the wrong direction until the railroads actually accomplish a much higher degree of standardization among themselves than is now the case.

Proper repairs and economical maintenance of cars is a much larger factor in this car service problem than most people seem to appreciate; so that those who plan for an ideal use and distribution of cars by increasing the distance between the proprietor and his property, first of all had better provide in their plan some *economical* method whereby the car they wish to use will always be ready for service when needed and will be safe to handle. It would seem therefore, from a practical standpoint, that we will be almost compelled to fall back on the railroad ownership plan; also, that we should introduce some incentive to keep a sufficient proportion of the car supply in the hands of the owner for proper maintenance, and to find some way of doing it with a minimum empty-car mileage. Our mechanical railroad officers can appreciate what a hopeless confusion would result from the general application of a system which disregarded these principles of ownership and maintenance and which caused a promiscuous distribution of "homeless" cars throughout the country.

In considering any system which involves the pooling and distribution of equipment without regard to ownership, we may become deceived from the present excellent transportation results which are being effected to meet war conditions. To guard against this, we must look a few years ahead to see where we will land under pool-operation with reference to the mechanical, carrying and service efficiency of the cars themselves, appreciating at the same time that the present pooling methods of disregarding ownership in the distribution of cars are only effective with a relatively small proportion of the total railroad equipment. Unless some plan is introduced into our new code which will give the owner a chance to maintain his standards, the hopelessness of the situation is apparent to all mechanical railroad men, and even to the manager or superintendent who is familiar with foreign-car troubles on his line and with the annoyance of having his yards filled with foreign cars waiting for repair material to be shipped across the country.

Some may argue that foreign cars should be fitted up with any kind of material which will make them safe to run, which is often done to meet emergency. Under such method as a general practice, the mechanical superintendent again will appreciate what the hopelessness of the situation would be a few years hence. Another road's standards might not be safe for his cars, and the judgment of the car inspector and outlying repair-gang would be substituted for the calculations of the drawing room. An inspector's free choice of repairs to an arch bar or truck frame would lead to disaster; and the haphazard substitution of door fastenings, for example, would bring on a resultant confusion which, although not necessarily dangerous, would be like mixing cats and dogs of the undomesticated varieties.

The standard construction of each car, whether good or bad, must be maintained by the workmen as the only practicable shop rule to insure safe repairs. The drawing room must authorize all departures and re-designing. We must maintain the car's own standards or use standardized cars. There is no middle ground of safety. Another point against the repairing of foreign cars with any kind of material in

order to keep them moving—even if the repairs were safely made and the design improved—is, that in creating an atmosphere of utter disregard for standards it would greatly increase repair costs. These increased costs would be excessive if the railroads were not able to carry spare parts for repairs which exactly fit the greater majority of cars going through their shops. Each job would soon become a “cut and fit” operation, and the economy of interchangeability would be lost. In fact, at this very time, when we are most enthusiastic about the great things that are being accomplished in transportation by only a limited pooling of cars from all railroads, there are not many who are talking loudly about the reduced freight car maintenance costs; and many of those who have considered this phase of the matter are dismissing the fact that repair costs have tremendously increased, by the well-worn-out answer: “high cost of material and labor.” Exactly so; but as soon as they begin to look a little further, they need not be surprised to find, that the material is costing much more because it is requiring larger quantities of it for cutting up and forging by hand into odd shapes to fit foreign cars, and that the labor is costing more because the “cut and fit” job by hand for foreign cars is requiring many more hours of pay. Miscellaneous foreign car repairs must be made largely on a day-work basis in order to be entirely fair both to the company and to the workmen. This loss in the use of standard parts for repairs, as well as a partial loss in the use of the piece-work system, is a very ominous thought to the well-informed, when they consider the adoption of a scheme for operating “common cars” in a country-wide pool.

Some may say that the present pooling system is showing so much greater earning power and capacity per car that the railroads can afford to pay greater repair bills. Yes; but let us give the new pooling system “a run for its money” for a couple of years, before we say much about the *net* saving per car; and then let us work for a couple more years under the old plan, with a more favorable Public and Shipper and more lenient Government inspection to deal with, before we publicly advertise our preference for the new pooling system in affording increased capacity per car, or in supplying cars in good order and ready for service when needed.

It would be most interesting for the railroads to analyze their present freight car repair costs at some of their shops or on certain divisions in order to determine the cost of repairing foreign cars relative to the cost of repairing their own. These figures would be startling, and the gradual mounting of the expense curve from month to month would be most interesting to watch as we continue to broaden out our present practice into a country-wide pooling system. The effect of any general decrease or increase in the average cost of materials could be accounted for, thus leaving a resultant curve which would give us some indication of the effect of adopting generally throughout the country a system in which the disregard of individual ownership of cars was a large factor. The great rise in actual cost of material and the percentage increases in the rates of wages are, of course, great factors in our present increased repair costs. This is not so serious, since it will have to come down again, at least part of the way; but the other factor in our present increased repair cost—the foreign car—is inherently connected with the operation of the pooling system, and on this account its effect on costs will keep on increasing, as a larger proportion of cars gets further and further away from the care of their owners.

CONCLUSIONS

In summing up we find a large number of fundamental principles involved, as well as kindred subjects to be developed, before we can arrive very far in outlining a practical code for car service and interchange. In this article, some criticism has been ventured concerning the several

codes which have been very ably worked out and which contain much good material. Certain principles in opposition to these codes have been defended with the view of trying to arrive at some unanimity of opinion, such as will form the basis for a start.

On the constructive and practical side, it may be interesting to consider the writer's previous suggestions which appeared in the *Railway Age Gazette* of July 20 under the head of “Some Constructive Thoughts on Car Interchange,” the substance of which is as follows: Railroad ownership of cars; proper compensation for ownership regardless of the user of the car; greater progress toward standardization, and minimum empty mileage. These suggestions were made with the thought of first seeking the correct principles to follow, and then evolving gradually from our present system, a workable set of general regulations amply supported by accurate statistics obtained from a thorough study of present conditions. Some practical suggestions were also included in this article looking toward the developing of such statistics as would afford proper information for the regulation of an equitable per diem rate for loaned cars, and such as would compensate the owner wherever the car might be used.

The information we now have at hand makes it seem that the old method of compensation for car hire is the simplest and the best, that is: to settle on a basis of car ownership, rather than on a quota basis or through the agency of an independent owning corporation. Our immediate investigations should develop a proper system for adjusting the per diem rate so that each railroad would be compensated equitably for its investment in the cars which are loaned to other roads. We should study every means for reducing empty-car mileage, including the development of convertible types of cars and the best ways of adapting the usual types to other than their regular uses. Our new statistics should show whether or not the increasing of the car supply has any effect in diminishing empty mileage, and if it has, should show in net figures, whether it is better for the railroad to own an increased number of idle cars and make less empty-car miles, or to operate with less equipment and make increased empty-car miles. In regard to the maintenance of equipment, it seems desirable to keep as large a proportion of cars as possible in the hands of the owner. As for operation, the railroads should take immediate steps to get a reasonable proportion of standardized cars into service as soon as possible, and then arrange to “move cars toward home under load,” or, when the car is far from home, in the opposite direction under load rather than home empty. A central bureau or board of railroad men should have general supervision of car distribution. They could direct the movement of cars to and from their owners when the natural movement was not promoting economic use and proper maintenance of the cars, and they could act in times of stress when unusual shifts of equipment become necessary in order to meet the local demand in various localities.

Our summary may be condensed into three questions which should assist in focusing the various problems towards a satisfactory conclusion, as follows: Shall we reduce empty mileage by disregarding ownership and thus improve the service of the present supply of cars at the expense of increased repair costs, or shall we keep down the repair costs by returning owner's cars and then improve the service by increased investment in cars at the expense of greater capital charges and increased idle cars and empty-car miles, or should the railroads get together of their own accord in rapidly putting into service standardized equipment having interchangeable repair parts so that the benefit of the two former alternatives gradually could be realized—in that the car supply thus could be improved by a flexible-distribution plan of generally serviceable standardized cars, which

would at the same time keep down the cost of repairs and not require much empty return mileage to the owner?

The Duty of the Railroads.—The above treatise may suggest to those in everyday touch with these problems some lines of thought for further development, and perhaps bring out better ideas which may differ in substance. Suggestions will be most valuable which are developed in sufficient detail to apply in a practical way to our present codes, and thus put the railroads in the position of having something actually started which will meet the new demands. This development must be the product of railroad experience; and our railroad minds must reveal the most desirable practice rather than wait for Governmental agencies to point out an arbitrary way. It is not a subject to be disposed of in the rush legislation of a closing Congress, or to be determined by law-makers who cannot appreciate or who are in no way familiar with the technicalities of the problem. Expert discussion by our railroad men should precede the enactment of law, rather than remaining dormant to invite the passing of legislation embodying general theories in accordance with popular demand and which may force a further burden upon the railroads. The recent Esch-Pomerehne amendment of the act to regulate commerce may yet, as a by-product of the war, prove to be a great hardship, and its enforcement may be unconstitutional in taking cars from one road and turning them over for the use of another, unless a proper system is evolved to compensate the owner equitably for his cars when they are arbitrarily loaned to another.

This general subject should be argued by our railroad men among themselves and through the columns of the railroad journals as a matter of self preservation, so that when the war is over they will not find themselves blindly following the dictates of some left-over war measure, or adapting themselves to the theories of the platitudinarian. No brand new or revolutionary practice will spring up suddenly, unless, perchance, it is forced by governmental agency on account of a lack of preparedness on the part of the railroads themselves in not being ready when the time comes to put into actual practice such principles and methods as will meet the new demands.

A plea is here entered for our railroad managers to begin an active standardization movement, and then with their car service and interchange experts vigorously to continue their study in the development of the broad principles involved, so that they can start right in at the next meetings of the M. C. B. Association and of the American Railway Association to work out a gradual transformation in the details of the present codes for interchange and car service. These codes today embrace the best that our railroad experts have been able to produce. They are the result of years of conscientious study and service, and contain much in detail which must be used as the basis for a code to meet the change which is taking place in the transportation world. Principles can be revised to meet the new demands, but which need not cause the discard of all the working detail which is the resultant of our best experience. Adherence to railroad ownership in our car distribution would save much of our present practice which can be broadly expanded and supplemented so as to meet the most fastidious demands of our new national transportation.

EXEMPTION FOR BRITISH RAILWAY SLOPMEN.—The Railway Executive Committee has informed the British National Union of Railwaymen that the director of recruiting has agreed that, until further notice, skilled men from railway shops, notified to the war-office for release, who are not required for mechanical or craftsmen's work in the army, will be returned to the railway companies, and will not be posted for combatant duties in line regiments.

ELECTRIC SECTION ADDED TO A MECHANICAL INTERLOCKING PLANT

The Delaware, Lackawanna & Western crosses the Pennsylvania at Bailey avenue tower, about three miles east of Buffalo, N. Y. This crossing is spanned by an overhead bridge carrying the main line of the Lehigh Valley and just north of the tower a highway bridge on Bailey avenue crosses over the Pennsylvania tracks. On account of the large amount of interchange freight handled between the Lackawanna and the Pennsylvania at this crossing, it was decided to add a double track wye connection south of the Lackawanna and east of the Pennsylvania tracks. A large part of the freight is hauled by the Pennsylvania over the Lackawanna main tracks from Bailey avenue to East Buffalo, a distance of about 1½ miles. From this point the trains run about 9½ miles over the Black Rock branch of the Lackawanna to a connection with the Grand Trunk. Previous to the installation of this wye, it was necessary for northbound Pennsylvania freights to back into the Lackawanna interchange tracks over a single-track connection. This arrangement not only blocked the crossing, but also congested the traffic on the interchange track.

Before the wye connection was installed, the old mechanical interlocking plant simply protected the grade crossing. This plant was operated by a 40-lever Saxby & Farmer interlocking machine with 18 levers operating signals, 11 levers operating switches, nine levers operating facing point locks, and two spare levers. The signals were of the lower-quadrant mechanical type. The high signals were slotted and pipe-connected, while the dwarf signals were wire-connected.

On account of the size of the new wye connection, it was not advisable to enlarge the old interlocking machine. Nevertheless, from a construction and maintenance viewpoint, it was desirable to utilize as much of the old apparatus as possible. To do this a 40-lever, style S-8, electric section was added to the old 40-lever mechanical machine, 38 of the mechanical and 33 of the electric levers in the new electro-mechanical machine being used for the operation of the 71 switches and signals.

This type of plant, while it is the first one of its kind on the Lackawanna, is giving good service on the Pennsylvania, and is entirely satisfactory for a busy layout. A recent count shows a total of 5,600 lever and 223 train movements per day at this plant. Of the 223 train movements, 43 were passenger and 180 freight.

The tower is of two-story frame construction, steam heated, and equipped with electric lights. In addition to housing the interlocking apparatus, the tower is used as a block station by the Pennsylvania for protecting traffic beyond the interlocking limits.

The electro-mechanical machine is located on the second floor of the tower. The electric levers of the S-8 machine are fastened in an iron frame above the mechanical locking bed. Each of the electric levers is connected to the locking bed by vertical iron rods, which actuate the mechanical locking. An indication lock is provided, preventing a signal being cleared under improper conditions. An electric lever locks each mechanical lever operating a switch or derail. Where a crossover requires two mechanical levers, on account of the distance from the tower, one electric lever locks both. The locking of levers 035L and 036L is so arranged that lever 036L must be operated in advance of 035L. This is done so that it will not be necessary to stop Lackawanna trains on the railroad or trolley crossing and to assist the trains over the grades on either side of the tower. Slow-speed signal 040L is given a separate number in order to permit switching movements to be made when Pennsylvania trains are on the crossing.

Above the machine, and supported from the ceiling by

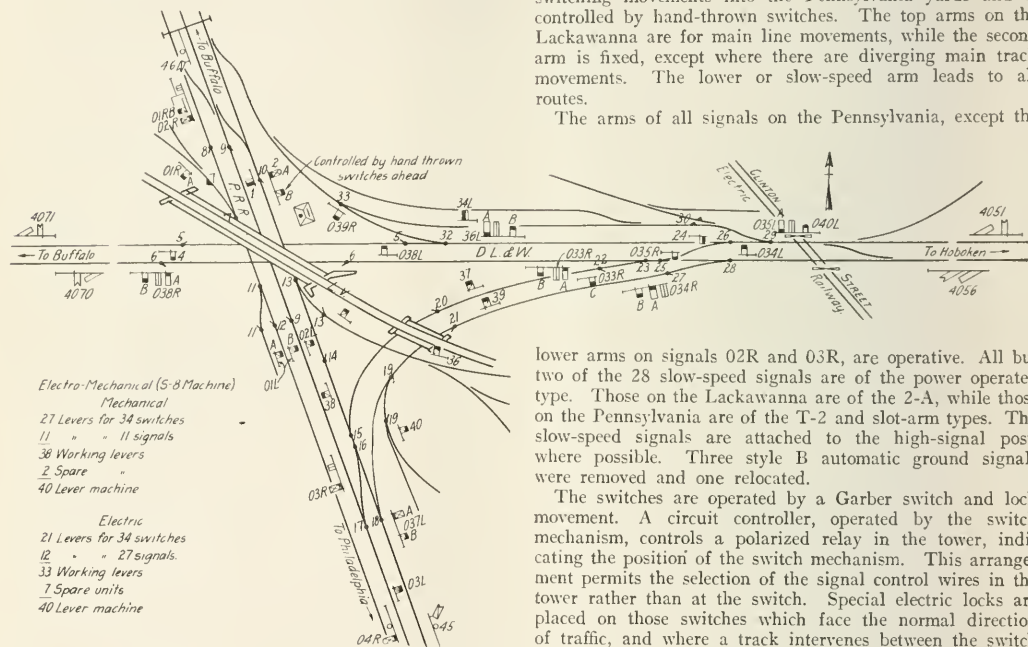
angle irons, is the illuminated track model. The model board, made in the signal repair shop at Hoboken, is of $\frac{1}{2}$ -in. ebony asbestos board, and shows the various tracks, track circuits and signals. The clear position of each signal and the condition of each track circuit is repeated on the model board by a $1\frac{1}{4}$ -watt, 12-volt, candelabrum type electric lamp that is operated on a 6-volt circuit. About 80 lights repeat the various signal and track indications. Two manipulation charts, mounted on the side of the model board, assist the towerman in picking out the proper levers for the indicated movements.

The line relays and the signals, in the limits of the interlocking, are operated from a 14-cell, 18-volt, type A-6, 225-a. h. storage battery. Outside the interlocking limits 16 cells of BSCO battery operate the distant signals, while 12 cells operate the line circuits. Three cells of BSCO battery, connected in multiple, operate each of the 40 track circuits. A fixed resistance unit, varying from 0.1 to 0.3 ohms,

Standard approach, detector and route locking circuits are used. Several clockwork time releases are provided in connection with the approach locking circuits on the high signals. A trap circuit is installed on the dead section of track at the Clinton street trolley crossing, just ahead of signal 035 on the Lackawanna. Several telephones, attached to the signal cases and located at convenient points, permit communication with the tower.

The signals on the Lackawanna are of style B, two-position, lower-quadrant type, while those on the Pennsylvania are of the style B and T-2, three-position upper-quadrant types; except that the distant signals are two-position, upper-quadrant, operating from 45 to 90 degrees. The normal position of the distant signals is at 45 degrees. The style B signals on the Pennsylvania are equipped with the proper attachments for giving the necessary upper-quadrant indications. Pennsylvania signals 04R and 2 are used as block signals. The lower arm on signal 2 is used for switching movements into the Pennsylvania yards and is controlled by hand-thrown switches. The top arms on the Lackawanna are for main line movements, while the second arm is fixed, except where there are diverging main track movements. The lower or slow-speed arm leads to all routes.

The arms of all signals on the Pennsylvania, except the





Tenryugawa Bridge (19 200-ft. spans), Tokaido Line.

The Progress of the Japanese Railroads*

Part 2—A Discussion of Track, Roadway, Signal Standards, Locomotive and Car Practice and Administration

By Sukehiko Goto

Civil Engineer for the Imperial Government Railways, Tokyo, Japan.

THE standard gage of the Japanese railways is 3 ft. 6 in. and the spacing of tracks is normally 12 ft. center to center, although 13 ft. is used on some of the main lines and 14 ft. on electrified lines. The side and vertical clearance, as shown in the diagram, are very small. The standard roadbed on tangent tracks is 16 ft. wide with ballast sections as shown on the typical cross section. The ruling grade is usually 2½ per cent. The rails are mostly 60 lb. or lighter, but renewals on main lines are being made with 75-lb. rails of A. S. C. E. section. Originally the English bull head rails were used, but these are no longer in track.

Timber cross ties are used, usually of chestnut wood. The standard dimensions are 5½ in. by 8 in. by 7 ft. On tangent level tracks 14 or 15 ties are laid to the 33 ft. rail or 13 or 14 to the 30 ft. rail. On some of the less important lines only 12 ties are used. An exception to the above standard is found on the Abt rack railway, where steel ties have been installed. The bridges consist principally of steel truss and plate girder spans, having a maximum span length of 300 ft. These are designed for a live loading corresponding to Cooper's E-33, E-40 and E-45.

In contrast with conditions in America the local stations in Japan usually serve a dense population, calling for a considerable amount of railway business. In consequence practically all stations must be supplied with rather extensive track and station facilities. Station platforms follow the English standard and are as a rule two feet above the top of the rail. Station buildings are usually of wood construction. Engine houses formerly followed the English rectangular design of brick construction, but the American roundhouse type has been adopted in recent years. The diameter of turntables is usually 60 ft.

Single track lines predominate, but the Tokaido and other heavy trunk lines are double track with a few sections of

four track lines. On not a few sections of the system daily train movements amount to 30 or more on single track and 60 or more on double track. This heavy traffic density is made possible by the short distance between stations which generally averages between three and four miles.

	Mileage of tracks in operation on December 31, 1915
Single track	5,000 miles
Double track	734 miles
Through tracks	1 mile
Four tracks	16 miles
Six tracks	4 miles
Total main line.....	5,755 miles
Yard and side tracks.....	2,277 miles
Total all tracks.....	8,840 miles

The number of stations including all block stations is 1,537.

Switching in Japan is generally done by the usual drilling method, and it is only within recent years that gravity classification yards have been taken into consideration. The first hump yard to be placed in operation is at the Tabata station in the northern suburb of Tokyo, which forms the largest classification yard in the country. It is one and one-half miles in length and contains 24 miles of tracks. Twenty-four hundred cars can be handled through this yard in a day. Work is now in progress on a similar yard for the Shinagawa station which will be much larger.

GRADE REDUCTION

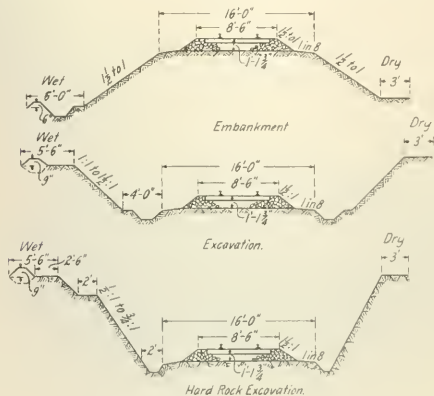
Owing to the mountainous character of a large part of the Japanese islands, railway location has been difficult in many portions and has entailed the use of heavy grades and sharp curvature. Grades of 3½ per cent and curves of 9 deg. are common, and in the case of the Abt rack line over the Usui pass a 6½ per cent grade was used. On the Kagoshima line, a large number of switch backs were required.

As traffic increased, it has been necessary to resort to reconstruction with a view to reducing gradients and improving the alignment. The most important reconstruction work has been done on the Tokyo-Kobe line, particularly the

*Part 1—A general account of the history, growth, organization and traffic of the Japanese railways appeared in the *Railway Age Gazette* of October 12, 1917, page 646.

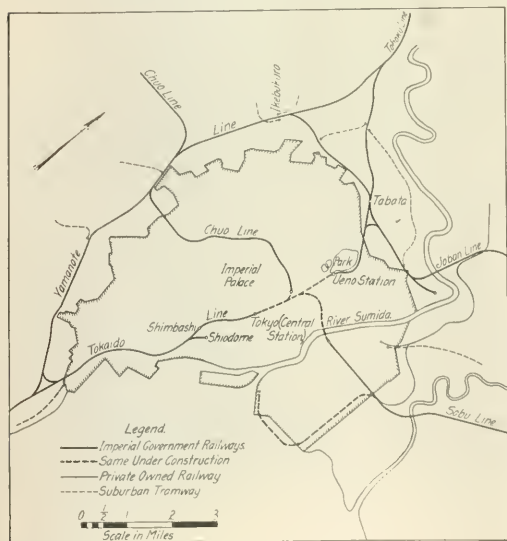
between the two railway systems was by means of the Yamanote belt line, a line of low capacity which has become greatly overtaxed with increased traffic.

The construction of the connecting line through the center of the city with a single station to serve both railroads was



Roadbed Sections

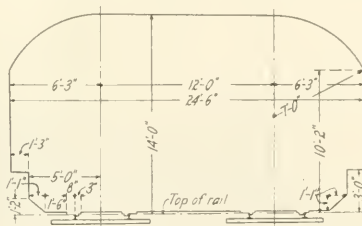
under consideration as early as 1896, but little was accomplished other than the purchase of some of the property until after the Russo-Japanese war of 1904-05. The central station was completed in 1914 as well as a portion of the connecting line, while the rest of it is still under construction. The completion of the new station has made it pos-



Map of Tokyo and Vicinity

sible to transform the old Shimbashi station into a freight terminal, and in this connection it is planned to make extensive terminal developments in the vicinity of the southwestern entrance to the city, where a considerable area of land has been made available by reclamation from Tokyo bay.

The connecting line referred to above is an elevated structure carrying four tracks, two of which are used for suburban service and two for through train service, operated by electric traction and steam respectively. Except for a small portion of the line, the tracks are carried on masonry and steel viaducts, concrete or brick arches spanning between masonry piers being the standard construction with steel plate girder structures supported on steel columns for the

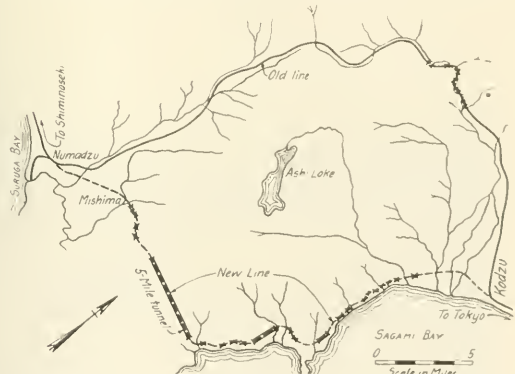


Standard Clearance Diagram

street subways. The floor thickness was reduced to a minimum by the use of half-through girders with solid floors.

SIGNALING

The safety system on Japanese railways has very much in common with that in use on English roads. Traffic on main lines is handled exclusively under the block system, the manual block instrument being used on double-track lines and the tablet controlling block apparatus on single-track lines. The electric lines are protected by automatic



Map and Profile of the Hakone Pass Project

signals of the Hall type. Semaphores are in general use on main lines, while disc signals are used on sidings. The important stations are provided with mechanical interlocking, while at smaller intermediate stations, where traffic is not heavy, a very simple interlocking method is in use.

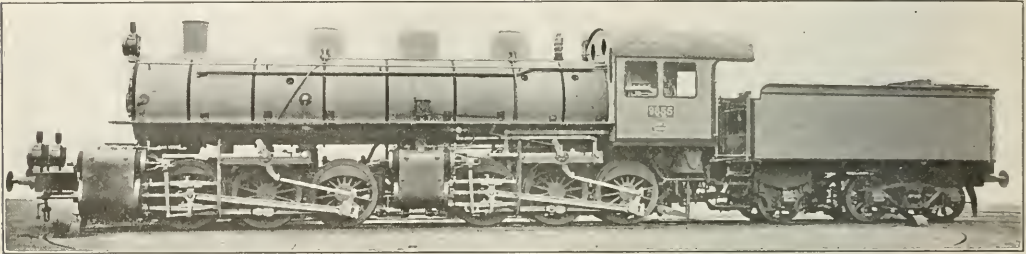
Siemens & Halske's interlocking apparatus, designed for use with the block system, has recently been installed between Kyoto and Kobe, one of the heaviest traffic sections of the steam lines in Japan, where the number of daily train movements is 60 and more, and where the interlocking and block systems in use on the other steam lines were found inadequate to insure safety.

LOCOMOTIVE PRACTICE

In the initial stage of the Japanese railways all the construction work was undertaken by English engineers, and

throughout the system. A further advance in this direction was represented by 4-4-2 and 2-6-0 types, which were installed in 1911 on certain of the main trunk lines on which these locomotives are now generally in use for through passenger service.

The freight locomotives of the tank type consist mainly of 0-6-0, 0-6-2 and 2-6-2 wheel arrangements, the number of 2-6-4 and 4-6-2 types being very small. In the closing years of the era of Meiji a number of 0-10-0 type engines were designed for use on heavy grades. Among the freight engines, with tenders, 2-6-0 types claim the bulk of the stock,

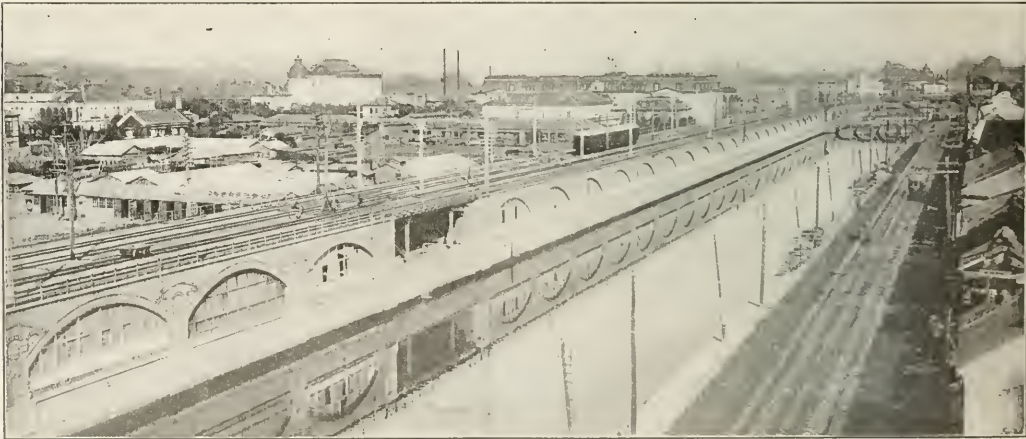


Mallet Type Locomotive of German Make

the locomotives in use were imported exclusively from England. That country long maintained a place as the guide of railroading in Japan, monopolizing the supplying of equipment for many years. From 1887, however, motive power of American and German manufacture began to come in and toward the close of the period under review the locomotives made in America claimed a far greater proportion of the whole stock than those of England. A few engines were also imported from Switzerland, while others were built

the remainder being of the 2-8-0 and 2-8-2 types. Toward the closing years of the Meiji era, the demand for 2-8-0 types increased and a number of 0-6-6-0 Mallet compounds were ordered from the United States.

Only a few locomotives were designed specially for service in yards. The greater part of those now employed in this work are engines which have been transferred from freight service when increases in traffic rendered them no longer capable of handling the road work. With the in-



Track Elevation in Tokyo

in workshops in Japan. However, these were insignificant in number as compared with those introduced from England, Germany and America. It may be noted that, while Japan has never failed to keep up with the latest standards of locomotive practice in the Occident, she has done practically nothing for which she could claim originality.

The wheel arrangement for tank locomotives in passenger service has gradually advanced from 2-4-0 to 2-4-2, while that for the tender type passenger engines has developed from 0-4-2 to 4-4-0, the latter type being the most common

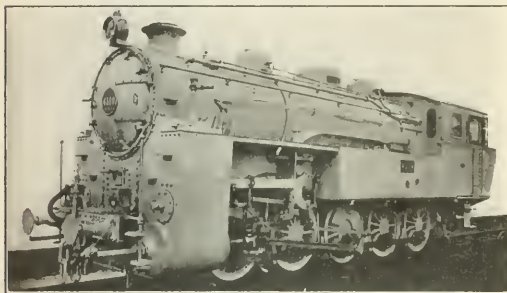
crease of train load, not only 0-4-0, but 0-6-0 locomotives of the smaller type were found inadequate for switching purposes, and in consequence a number of 0-6-0 of larger type and 0-6-2 engines were withdrawn from the main line service for use in large yards.

Like the Americans, the Japanese have failed to realize satisfactory progress with compound engines which are looked upon as the natural and most efficient form of locomotive in Europe. The first compound locomotive installed upon Japanese railways was put to work in May, 1893. A

small number of additional compound engines were added year after year, but the stock of this type was by no means great, totaling only 54 out of a total of 2377 in 1912. The reason why the compound principle as applied to the locomotives has failed to commend itself to Japanese practice lies in the fact that its structure is extremely complicated. Japanese railways are diversified by the presence of a great number of grades, and this fact makes it impossible to work the compound engines to advantage, while in addition various difficulties attend the design of four-cylinder compounds adaptable to the narrow gage railways.

Japan has adopted superheated locomotives extensively. Occidental practice has been applied here, although it is interesting to note that about 1902-3, when the Schmidt superheater was coming into general use a smokebox superheater was manufactured for trial purposes in Japan, but the test did not develop the desired results. The adoption of the Schmidt superheater in Japanese railways dates from 1911, when some engines ordered from Germany were put in service on the State Railways. These were followed by other locomotives ordered from America.

Because of English influence the continuous vacuum brakes were adopted and are now in general use. Locomotives on the Hokkaido Colliery Railway were equipped with Westinghouse compressed air brakes, but these were sub-



Largest Tank Locomotive in Japan

sequently taken out of service for the purpose of standardizing the operating equipment on the State Railway system. The rack rail locomotives over the Usui Railway are provided with band and counter-pressure brakes.

From the first, couplers of the English pattern were employed on the Japanese railways not only for locomotives imported from England but also for those imported from other countries. The English types were also used in Kyushu which is separated from the main island by the Shimono-seki strait, while, in the Hokkaido, automatic couplers of American type were adopted by the government lines. Apart from the fact that the English type compels men to go between cars, the maximum tractive capacity of the coupler of this description is anything but adequate, and it is not unlikely that the limitation upon its strength may finally hamper the necessary development of the motive power itself. Viewed in this light, the American coupler is judged as a decided improvement upon the English. The only disadvantage inherent in its structure is that the coupler does not admit of being partially remodeled, and the trouble of wholesale reconstruction involved in the remodeling of the coupler has so far deterred the railway management from bringing about the important reform, save for a slight improvement effected in the matter of strength.

FUEL

Fuel for use in locomotives was at first furnished mainly by coal of high quality produced in the islands of Kyushu

and Hokkaido. After years of careful inquiries into the relative merits of products of various localities, the railway management has succeeded in effecting an important saving in this item of cost by the wise selection of coal of the kind which is at once economical and efficient.

About 1898 a trial use was made of oil, and it gave good satisfaction, while emitting very little smoke. These advantages coupled with the low price which generally obtained at that time, induced the railway management to adopt oil in part of the engines employed on the Usui, the Shin-Etsu, and the O-U lines. However, as a result of the gradual rise in the price of oil, the use of liquid fuel was found uneconomical and was discontinued.

In the initial stages of Japanese railways all locomotives were imported from England through the medium of English merchants and were operated by English engineers. It is true that during 40 years of railway development marked progress was made in the matter of speed, tractive power, design and material, but for all that, Japan failed to reach a state of independence as regards a supply of equipment. The greater part of the stock in use on the State and private railways was represented by engines ordered from abroad. They were built in accordance with the specifications of the Railway Board with respect to the general arrangement and the dimensions of the principal parts, but Japan was dependent solely upon the design and workmanship of foreign mechanics for the details.

From about 1893 spasmodic attempts were made to manufacture locomotives at more than one railway shop in Japan, but these shops, originally designed for the repair of engines, were inadequately equipped for manufacture. It was not until 1896, with the establishment of the Kisha Seizo Kaisha in Osaka, that the corner stone was laid for the locomotive industry in Japan. The nationalization of the railways gave no small impetus to the work of car-building in Japan, and in 1908 the Kawasaki Dockyard Company commenced building locomotives at the branch plant at Hyogo. By 1910-11 the two foregoing plants attained a state of great efficiency in the matter of workmanship as well as capacity. The result was the gradual shrinkage of foreign imports and in 1912 the entire order of new engines for the next fiscal year was given to these two plants.

The steady progress made in the building of locomotives at home encouraged the manufacture of parts and appurtenances, and at present this has also reached a stage of independence, although the country is still dependent upon foreign manufactures for the supply of materials. Because of the efforts of the railway authorities in helping forward Japan's locomotive industry more than \$2,000,000 was kept at home through the stoppage of foreign importations of engines.

RAILWAY RESEARCH WORK

Technical test work on Japanese railways began in 1907 when a laboratory was created to conduct tests and experiments on cement, volcanic ashes, fuel, paints, oils and fats and all other kinds of railway materials with a view to furnishing proper guidance to purchasing officers. In 1912, the scope of work in the laboratory was extended to cover technical research on all matters relative to railway materials. Special attention is paid to articles of Japanese production with the idea of fostering domestic industry. Still more appreciable are the results of investigation with a view to the improvement of railway materials.

A second laboratory was established in 1912 with the object of investigating the physical properties of railway materials. The functions of this laboratory are to make tests upon the principal items to be purchased to investigate specifications for purchase; to test the efficiency of finished materials; and to examine the rejected materials and trace the cause.

A locomotive testing plant was constructed in 1911 to de-

termine the proportions of locomotives and parts best suited for the narrow gage lines of the railways, and to ascertain the relative values of the different kinds of coal. The plant is of practically the same pattern as that of the Pennsylvania Railroad at the Louisiana Purchase Exhibition. During 1914-15, 19 tests were conducted on the efficiency of locomotives in addition to the making of chemical analyses of 137 kinds of fuel and the trial burning of 46 kinds of coal.

In view of the prospective shortage in the supply of the Japanese chestnut timber which represents the bulk of cross tie material for the railways, technical research was started regarding possible substitutes. Some 40,000 ties of Japanese chestnut, obtuse ground cypress and 10 other kinds of timber were procured, and after crosscutting, were laid in the different tracks in order to ascertain their actual service.

EDUCATION

In order to meet a growing need for technically-trained help it was decided in May, 1909, to provide an institution to give vocational education to railway employees. A number of district institutes were established in the different divisions for the purpose of instructing young employees in practical knowledge directly bearing on outdoor work, while a central institute was created at Tokyo to cover railway technology of a higher character. Students were selected by examination from among the employees in the general offices and among graduates of the district institutes, special care being taken in filling up the classes with students possessed of reliable character and practical ability as demonstrated in their actual service.

Although the institutes showed very satisfactory results, the arrangements of their courses developed a tendency toward purely academic exercises rather than the practical study of railroading. Accordingly, the regulations of both the central and district institutes were revised in 1913 to establish a more emphatic distinction between the two, the first being devoted to the scientific study of railway business in general, and the latter to teach and train apprentices for a term of six months in practical station and engine house service. The central institute was divided into four courses, business, mechanical, electrical and English language, while the school term was extended to 18 months.

Accompanying the classroom work, the students are taken on excursions at frequent intervals, making a round of visits to various tourist points and manufacturing centers where they observed the relation of business to freight traffic. Special attention was paid to acquainting the students with general features of railways as the minds of railway employees are too liable to run in the narrow grooves defined by the scope of their immediate duties.

Dormitories were provided to train the students in regular habits under the charge of a special inspector, so that they may learn to qualify themselves for the life of co-operation essential to railway service in which the maintenance of discipline among the rank and file is of no less importance than in the army.

The roll of students at the central institute for 1914-15 included a total of 134, while 80 were graduated. During the same year the district institutes graduated 2,002 students, of which 357 took the regular business or technical course and the rest took special instruction—328 for conductors or stationmen, 667 for firemen, 45 for motormen, 439 for telegraph operators, 64 for car inspectors and 182 for enginemen.

SAFETY FIRST IN JAPAN

"Safety First" work on Japanese railways is still in a primitive stage. In September, 1913, an accident prevention committee was organized in the Railway Board under the supervision of the vice-president to investigate accidents and make suggestions for preventing their recurrence. About that time the existing local safety associations were reorganized and unified so that the co-operation among

the units might be fully insured. Separate meetings of the working forces are held monthly at various points on the line to discuss safety matters and various divisional meetings are also conducted.

Each employee is subjected to a physical examination at the time of his employment, and in case of enginemen and firemen the examination is made regularly once a year. A number of experts are sent around to deliver lectures on sanitation to employees, and circulars and bulletins on sanitary and medical matters are distributed from time to time. Special attention is paid to the provision of sanitary arrangements for workshops.

RELIEF ASSOCIATIONS

Relief provision was maintained under the old regime, but the sums allowed were inadequate. After the nationalization of the leading private railways a relief association was organized based on a labor insurance system. Under the new arrangements a material increase was effected in the grants made in case of injuries sustained in the discharge of duties, while death and old age benefits were fixed at graded rates determined in consideration of age, wages and tenure of service. Lastly the allowance of refunds of the subscription was provided for in case of withdrawal from service. The stock fund of the association consists of subscriptions from the members and an annual government subsidy to the amount of 2 per cent of the aggregate earnings of the members.

Membership is compulsory or optional, according to the nature of the service. The roll of the association on March 31, 1915, shows 105,854 members, of which 94,402 were compulsory members, 534 optional members and 10,918 of a special class. There are several grades of grants, depending upon the seriousness of the injury, varying from an amount equal to wages for a period of one year and seven months to two years and six months, to an amount equal to six months' wages. The government furnishes medical attention and hospital services free to railway employees injured on duty.

TRAIN ACCIDENTS IN AUGUST

The following is a list of the most notable train accidents that occurred on the railways of the United States in the month of August, 1917:

Collisions						
Date	Road	Place	Kind of accident	Kind of train	Kil'd	Inj'd
1.	Norfolk & W.	Rippon.	bc	F. & F.	2	5
1.	N. Y. N. H. & H.	Williamst.	bc	F. & F.	0	15
5.	Chicago M. & St. P.	Milwaukee.	bc	F. & F.	5	0
8.	N. Y. Central.	Geneva.	xc	F. & F.	2	0
15.	Ches. & Ohio.	Mead's.	xc	F.	0	1
15.	Southern Pac.	Hayden, Nev.	bc	F. & F.	4	0
15.	M. K. & Tex.	Vatauga.	bc	F. & F.	2	0
19.	Penn.	E. Pittsburgh	xc	F. & F.	3	2
21.	N. Y. Central.	Albany	xc	F. & F.	0	0
24.	Peoria & E.	Mansfield	bc	F. & F.	2	11
24.	M. K. & Tex.	Wilton, Mo.	bc	F. & F.	1	1
30.	Ky. & Ind. Term.	Louisville.	bc	F. & F.	0	1
Derailments						
Date	Road	Place	Cause of derailment	Kind of train	Kil'd	Inj'd
2.	Balt. & Ohio.	Frederick.	neg.	F.	2	4
5.	Central Ga.	Hatcher's.	washout	D.	.	.
7.	Natchez, U. & R.	Urania, La.	unx	F.	5	0
17.	N. Y. Central.	Gouverneur.	derail	F.	2	0
20.	N. Y. N. H. & H.	Hartford.	acc. obst.	D.	0	2
20.	N. Y. N. H. & H.	Saybrook J'n.	acc. obst.	F.	0	0
22.	Toledo & O.	Lime City.	unx	F.	1	27
330.	Gulf Coast L.	Chopla, La.	derail	F.	2	4
31.	Southern	Constitution.	derail	P.	1	1
Other Accidents						
Date	Road	Place	Kind of accident	Kind of train	Kil'd	Inj'd
11.	Western Md.	Connellsville.	boiler	F.	0	2

1 Abbreviations and marks used in Accident List:
 bc, Rear collision; bc, Butting collision; xc, Other collisions—b, Broken—d, Defective—unf, Unforeseen obstruction—unx, Unexplained—derail, Open derailing switch—ms, Misplaced switch—acc. obst., Accidental obstruction—malice, Malicious obstruction of track, etc.—boiler, Explosion of locomotive on road—fire, Cars burned while running—P, or Pass., Passenger train—F, or Ft., Freight train (including empty engines, work trains, etc.)—Asterisk, Wreck wholly or partly destroyed by fire—Dagger, One or more passengers killed.

The trains in collision at Rippon, W. Va., on the 1st were through freights, and 4 engines and 10 cars were wrecked. Two firemen were killed and 5 other trainmen were injured. The wreck took fire but the fire did but little damage. The collision was due to the concurrent failure of trainmen and an operator. The men in charge of the northbound train overlooked a meeting order and an operator failed to display his stop signal.

The trains in collision at Willimantic, Conn., on the 1st were an eastbound passenger train and a locomotive without a train, running west. The collision occurred within yard limits and both trains were moving at moderate speeds. Fifteen passengers were slightly injured. The light engine was not running under control as required by rule.

The trains in collision at Milwaukee, Wis., on the night of the 5th were through passenger trains. Both engines were damaged. Five persons were killed: the engineman of Train No. 3 and four trespassers riding on the end of the mail car of Train No. 58.

The collision at Geneva, N. Y., on the 8th occurred within yard limits. Two light engines moving south collided with another light engine moving north. Two employees were killed. The cause of the collision was a mistake in hand signaling; the men in charge of the southbound engines (173 and 1785) acted on a motion from a switch tender which was intended for engine No. 3783.

The train involved in the collision at Mead's, Ky., on the 15th was westbound passenger No. 23. The train collided with a car standing on the main track which had escaped control on a mine track, where it was being moved down grade by mine employees. The engineman was injured and about 25 persons in the coaches were slightly hurt by broken glass. The car had escaped from the mine track because of the failure of a derail to stop it. The derail was spiked to an unsound tie and the car pushed it to one side.

The trains in collision on the Southern Pacific at Hafed, Nev., on the 15th were eastbound extra freight No. 2516 and a westbound local freight. Both engines and ten cars were wrecked. One engineman, one brakeman, one other employee, and one trespasser were killed. The eastbound train had passed a distant signal at caution but had not been promptly brought under control; and the westbound had encroached on the right of the eastbound, trying to reach Hafed when there was not time to do so.

The trains in collision at Watauga, Tex., on the evening of the 15th were a northbound passenger and a southbound freight. The freight had been brought to a stop and was being backed into a side track. The engineman and fireman of the passenger train were killed and four passengers were injured.

The trains in collision at East Pittsburgh, Pa., on the 19th were an eastbound through freight and another freight which was switching on the main track. Ten cars were wrecked and the conductor, engineman and one brakeman of the through freight were killed and two trainmen were injured. The cause of the collision was disregard of a stop signal by the through freight.

The trains in collision at Albany, N. Y., on the 21st were an eastbound "hill pull," a light engine and a "yard pull." Three locomotives and several cars were damaged. The "hill pull" became uncontrollable on a steep descending grade and collided with a light engine, which was not in motion, and this in turn struck the "yard pull," near North Pearl street. As the "hill pull" departed from West Albany yard, a knuckle opened on the west end of fourth car, and, following this the angle cock was closed to enable trainmen to release the air brakes. When the train was recoupled it appears that the brakeman neglected to open the angle cock and the men in charge of the train neglected to test the brakes, thus leaving the train with insufficient brake power.

The trains in collision at Mansfield, Ill., at 1 a. m. on

the 24th were eastbound passenger No. 44 and a following freight train. The passenger train was standing at the station, and the rear car, a sleeping car, was wrecked. Two passengers were killed and 11 were injured.

The trains in collision near Wilton, Mo., on the 24th were westbound freight No. 93 and eastbound freight No. 72. Both engines and two cars were damaged. One trespasser was killed and one injured. The cause of the collision was that train No. 72 had become more than 12 hours late (thus losing its right to the road) and had not been protected by flag. The westbound train had stopped.

The trains in collision on the Kentucky & Indiana Terminal at Louisville, Ky., on the 30th were a passenger train of the Baltimore & Ohio, drawn by a locomotive of the Kentucky & Indiana Terminal, and a freight train being pushed by a locomotive of the Illinois Central. The engine of the passenger train and three cars of the freight were wrecked. The fireman of the passenger train was injured.

The train derailed near Frederick, Md., on the 2nd was an eastbound freight. Two trainmen were killed and four were injured. A car in the middle of the train was derailed, and fell in front of a westbound freight which was passing at the time and 18 cars were derailed. The car in the eastbound train was buckled and knocked off the track when the slack was closed up by two pushing engines.

The train derailed near Hatcher's Station, Ga., on the evening of the 5th was passenger No. 20. The first three cars were thrown off the track at a washout and a passenger coach was ditched. The injuries are all reported slight.

The train derailed on the Natchez, Urania & Ruston, near Urania, La., on the 10th was a freight train loaded with logs, descending a grade. The locomotive was overturned and five persons were killed. These were a woman and three children riding on the locomotive and the engineman, the engineman having been scalded fatally while trying to release the woman and children from beneath the overturned locomotive. The cause of the derailment is reported as not ascertained.

The train derailed near Gouverneur, N. Y., on the 17th, was a northbound freight. The engine was thrown off the track at a derailing switch and fell down a bank; and the engineman and fireman were killed.

The train derailed on the New York, New Haven & Hartford, Valley division, at Hartford, Conn., on the 20th was a northbound passenger. The engine was overturned and the engineman and fireman were injured. The derailment was caused by a plank which had been placed as a barrier by street repairers, and had been knocked down onto one rail of the track.

The train derailed near Saybrook Junction, Conn., on the 20th was an eastbound locomotive with no cars. It was thrown off the track and overturned at a crossing by striking an automobile. The engineman and fireman escaped with slight injuries. Out of 9 persons in the automobile, 8 were killed.

The train derailed at Lime City, Ohio, on the 22nd was an excursion carrying the Columbus Retail Grocers' Association. The engine was overturned, and a traveling fireman, riding in the cab, was killed. Twenty-five passengers and two trainmen were injured. The derailment was caused by spread track. An officer of the road writes that "just what spread the track is as yet undetermined, a peculiar feature being that the track was spread not only at the point of derailment, but for a distance of some 300 feet beyond the point where the train finally stopped. This spreading, of course, could not have been caused by the derailed train, as it did not pass over this 300 feet of track. Whether this spread was caused by a loose wheel, or something dragging on some train which passed ahead of the derailed train, is as yet undetermined. Another peculiar feature is that eight trains had passed over this track in the

preceding 12 hours, and the engineers in charge of these trains all testify that there was nothing noticed to indicate that there was anything wrong with the track. Of these eight trains, three were passenger trains."

The train derailed on the Gulf Coast Lines, near Cholge, La., on the 30th was castbound passenger No. 2. The derailment was due to the breaking of a switch as the train passed over it. The first two cars were overturned. One passenger was killed and the conductor, engineman and four passengers were injured, the conductor fatally.

The train derailed near Constitution, Ga., on the 31st was local passenger No. 4. The engine and the baggage car were overturned, and the engineman and fireman were seriously scalded. The engineman subsequently died of his injuries.

The train involved in the accident near Connellsville, Pa., on the 11th was a westbound freight. The boiler of the locomotive exploded and the engineman and fireman were injured.

Electric Car Accidents.—Of the 12 serious accidents on trolley roads in August, two had fatal results; the butting collision at North Branford, Conn., August 13, in which 19 persons were killed, and a derailment at Wellsley Hills, Mass., on the 26th, when one man was killed.

SPEED "LAWS" HAMPER RAILROAD EFFICIENCY

It is well known how both railroads and shippers have co-operated to meet the emergencies created by our entrance into the war. Typical of the carriers' response to the needs of the nation was the united action of the railroads within five days after the declaration of war to merge the transportation lines of the country into one great operating organization. No less important in contributing to the increased carrying power of the railways have been the effective efforts of shippers throughout the nation to diminish delay in handling cars and to load them to maximum capacity. It has remained for T. J. Foley, vice-president in charge of operation of the Illinois Central, to point out the great loss in transportation efficiency caused by unreasonable speed restrictions imposed upon the carriers by many cities and towns throughout the country. In a letter addressed to trainmen and enginemen Mr. Foley estimates that if the speed restrictions were abolished the railroads of the country could haul 4,373,952 additional freight cars a distance of 100 miles, or 75,023,520 additional tons of freight a distance of 100 miles in the course of a year. In this letter Mr. Foley said in part:

"It would seem that the only slack left in the railroads is the slack which the people themselves, who are asking for maximum efficiency, have placed in them. Little impediments to operation, in the aggregate, constitute great obstructions. For instance, on the Illinois Central system there are 480 speed restrictions. Practically every hamlet, town and city has its speed restriction, the great majority of which are six miles an hour for freight trains. These restrictions, in many instances unreasonable in the extreme, constitute an enormous burden on interstate commerce. On the main line of the Illinois Central between New Orleans and Chicago there are 91 places where the speed of freight trains is restricted, either by ordinance or state law, the total distance embraced in these restrictions being 57 miles. There are 48 places where passenger trains are required to reduce speed to six miles per hour. Between Omaha and Chicago there are 36 speed restrictions for freight trains and the same number for passenger trains. Many of the places where trains are required to slow down to six miles an hour are mere villages.

"The loss of time resulting from complying with unreasonable speed restrictions on the Illinois Central system is equivalent to a day's work of 49,883 men in each year. This waste is particularly burdensome at this time when the

shortage of labor is a tremendous handicap to efficient operation. Ten thousand more men could now be used on the Illinois Central system if they were available. Complying with these restrictions means the waste of 361,533 tons of coal per year, of the value of \$758,030 at present prices. It means the waste of 10,021 locomotive days in each year, and there is an unprecedented shortage in locomotive power. It means the waste of 248,522 freight cars for one day in each year. Figuring this waste, due to unreasonable speed restrictions, another way, I find that if these speed restrictions were abolished, the Illinois Central could haul 99,408 additional freight cars 100 miles per year with the same number of locomotives and men, or it could haul 1,705,080 additional tons of freight a distance of 100 miles with the same number of locomotives and men. Assuming that speed restrictions throughout the United States average the same per 1,000 miles of track as they do on the Illinois Central system, there are 21,200 speed restrictions in the United States. Complying with these speed restriction laws means the loss to the country of 2,203,210 men for one day in each year. It means the loss of 15,967,840 tons of coal of the value of \$33,479,570. It means the loss of 442,550 locomotive days in each year, and the loss of 10,934,968 freight cars for one day in each year. It means that if these unreasonable speed restrictions were abolished the railroads of the country could haul 4,373,952 additional freight cars a distance of 100 miles, or that they could haul an additional 75,023,520 tons of freight a distance of 100 miles in the course of a year. In these calculations, no allowance is made for the loss of time and money occasioned by pulling out draw-bars and damages to equipment on account of slowing down and starting up heavy freight trains, and railroad men will understand that this loss is considerable.

"I have not heard that there is disposition anywhere to co-operate with the railroads by removing unreasonable speed restrictions. Shippers have taken a lively interest in co-operating with the railroads in increasing their efficiency, but the authorities in the villages, towns, cities and states have not done anything. Perhaps this is because they have not been asked to do so. I think it would be meet and proper for you gentlemen to discuss this matter with the people whenever you have an opportunity.

"Speed restrictions are intended to make it safer for pedestrians and occupants of vehicles, both horse-drawn and motor-propelled, regardless of the inconvenience to transportation. It is thought by many that if trains are required to go through towns slowly and softly, with enginemen and trainmen on the lookout, that there will not be so much danger of accidents. The effect of this is to educate the public to become careless about railroad tracks. There ought never to be anything done towards teaching the public that railroad tracks are safe. The public ought to be taught that they are dangerous in the extreme, and the more dangerous they are the more care will be taken by the people themselves to avoid accidents. The idea of placing responsibility on the railroads for safety at railroad crossings is wrong. Crossings considered the most dangerous, we know from experience, are the scenes of fewer accidents than crossings considered comparatively safe. If speed restrictions were removed, in my opinion, accidents would not increase, because the people would become educated to look out for themselves at railroad tracks, instead of depending upon others to look out for them."

JAPAN GETS BIG STEEL SUPPLY FROM U. S.—Japan's imports of iron and steel from the United States in September, 1917, touched a new high record. In that month \$13,000,000 worth of iron and steel bars, plates and sheets was imported, compared with less than \$10,000,000 the previous month. This is the first time that iron and steel imports exceeded cotton imports into Japan from the United States.

Conversion of Freight to Switch Locomotives

Engines Which Were Considered as Practically Obsolete Are Rebuilt and Adapted to Modern Service

By W. H. Hauser

Mechanical Engineer, Chicago & Eastern Illinois.

THE Chicago & Eastern Illinois has an engine class containing sixteen 12-wheel freight engines which were built in 1897 and 1899. When these were first placed in service they were considered among the largest in the country. The size of freight equipment has increased so

be made simply by removing the engine truck and the rear pair of drivers. In the case of our 12-wheelers, however, this conversion had never been considered as the engines were not designed to permit proper weight distribution if this simple plan of conversion were followed. It was found



Fig. 1—The Twelve-Wheel Locomotive Before Conversion

greatly, however, that for some time past these 12-wheelers have been relegated more and more to odds and ends of service, with their obsolescent day fast approaching. More recently they frequently have been used in a sort of semi-switching and road service but not with entire success due to their long rigid wheel base. They are well built engines,

necessary to change the wheel spacing in order that the proper wheel loads might be obtained.

One of these engines both before and after conversion is shown in Figs. 1 and 2. It will be noticed that the converted 6-wheel switcher is in general a better looking engine than the original 12-wheeler. Many characteristics of the

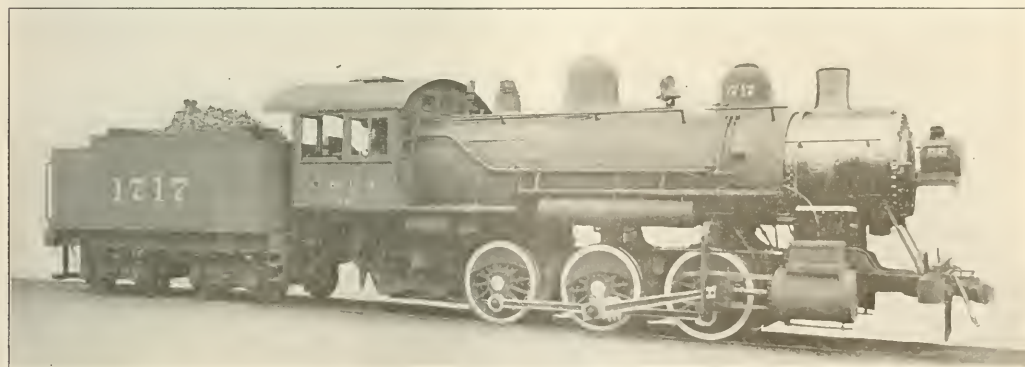


Fig. 2—The Converted Six-Wheel Switcher

however, except for the type of firebox, which is of the O-G type, very narrow and 10 ft. 6 in. long.

On account of growing need of switching power it was proposed to change some of these 12-wheelers to 6-wheel switchers. The idea of converting freight engines with four pair of drivers and an engine truck to 6-wheel switchers is not a new one as it has been practised by other roads where the engines were so designed that the change could

engines are similar, as is to be expected, but some of the more important are quite dissimilar as will be noted below:

	Before conversion, 12 wheeler	After conversion, 6 wheel switch
Service	Freight	Switch
Traction effort	35,400 lb.	35,400 lb.
Weight in working order	175,500 lb.	160,660 lb.
Weight on drivers	144,050 lb.	160,660 lb.
Weight on leading truck	35,050 lb.	.....
Weight of engine and tender in working order	292,390 lb.	263,160 lb.

	Before conversion,	After conversion,
	12 wheeler	6 wheel switch
Wheel base, driving	15 ft. 6 in.	12 ft.
Wheel base, total	25 ft. 4 in.	12 ft.
Wheel base, engine and tender	54 ft. 7 in.	45 ft. 2 in.
Weight on drivers ÷ tractive effort	3.36	4.53
Simple cylinders, diameter and stroke	21 in. by 26 in.	21 in. by 26 in.
Driver wheel diameter	55 in.	55 in.
Boiler, style firebox	O-G	O-G
Boiler, working pressure	200 lb.	200 lb.
Firebox, length and width	126 in. by 41 in.	126 in. by 41 in.
Flues, number and outside diameter	288—2 in.	288—2 in.
Heating surface, flues	2,045 sq. ft.	2,045 sq. ft.
Heating surface, firebox	197 sq. ft.	197 sq. ft.
Heating surface, total	2,242 sq. ft.	2,242 sq. ft.
Grate, length and width	126 in. by 41 in.	94 in. by 41 in.
Grate area	5,250 sq. ft.	26.8 sq. ft.
Tender, weight light	42,500 lb.	41,000 lb.
Tender capacity, water and coal	6,000 gal.—13 tons	5,000 gal.—10 tons

In converting, the locomotives data covering actual or computed weights were collected for the entire locomotive and its various parts. It was found that by lengthening the distance between the second and third drivers by 17 in. and by shortening the distance between the first driver and the center line of the cylinder by the same amount that the weight on all three pair of drivers would be very evenly divided—in fact, more evenly than is frequently the case

this frame as compared with taking down the entire frame and welding it by the blacksmith fire method follows:

Cut and weld with Oxweld	Taken down, cut, welded and replaced by the blacksmith fire method
\$112	\$387

There are other minor items in connection with the change in the design of the locomotives such as a new and heavier guide yoke brace and a new cast steel guide yoke. The main rods were shortened 17 in., while the side rods between the second and third drivers were lengthened 17 in. The spring rigging had to be altered but to offset this was the salvaged old springs and the fact that repairs and renewals have had been necessary with the old spring rigging anyway. When the first engine was placed in service it was found that owing to the size of the firebox the firing had to be watched with the greatest care, in fact too closely to permit of economical operation. The engines had always been free steamers in freight service when properly fired, but when placed in switch service they became too erratic. After a few trials this trouble was overcome by disconnecting and laying firebrick over three of the front

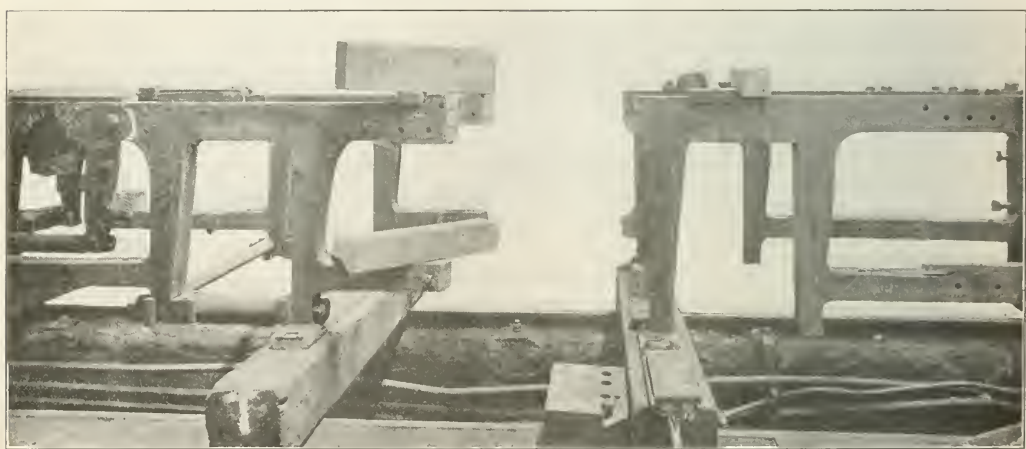


Fig. 3—The Frames Ready for Welding in the Additional Material Between the Second and Third Drivers

with newly built six-wheel switchers. Below is shown a table of these weight distributions:

	Twelve wheeler, before conversion	Six wheeler, after conversion
Engine truck	35,050 lb.	50,900 lb.
First pair drivers	35,050 lb.	57,800 lb.
Second pair drivers	35,250 lb.	52,000 lb.
Fourth pair drivers	35,100 lb.	

The method followed in changing the frame was quite novel and interesting. The upper and lower front frames were removed and delivered to the blacksmith shop. Six holes were plugged and welded in the blacksmith shop in the rear end of both top frames in order to match with the holes in the top front tongue of the main frame, while the rear end of the lower front frame was straightened and cut off to fit. The main frames were cut with the Oxweld torch between the second and third drivers and separated and 17 in. of each of the front upper main frame tongues were cut off by the same means.

Fig. 3 shows how the frames looked after the blacksmith and machine work had been completed and they were ready for welding in the 17 in. pieces between the second and third drivers. These pieces were welded in with the Oxweld torch. The finished job had a neat appearance. Cost figures covering the Oxweld method of cutting and welding

grates and building a wall 27 in. high at the rear end of these brick. Since doing this five of the converted engines have operated with great success and the others are to be converted as conditions permit.

The total cost of the extra work attendant on converting a single engine and over and above the general repairs and credits obtained for material removed was approximately \$450. The converted engines have been very successful in service both from a mechanical and operating standpoint.

BRITISH LABOR LEADER OPPOSES EIGHT-HOUR DAY DEMAND.—Speaking recently, J. H. Thomas, the general secretary of the National Union of Railwaymen of England, said that it was painful for him to have to oppose a demand for an eight-hour day, but he could not allow 370,000 men to be involved by 30,000 engineers. He had been put in a false position. The moral of the recent agitation was to show the absolute futility of sectional unionism. Approximately 143,000 railwaymen had enlisted, 5,000 of whom had made the great sacrifice. Thousands were already back, and many more would return, shattered in mind, body and spirit—mental derelicts. His conception of leadership was not to lead from behind, not to consider whether a thing was popular or not, but having made up his mind a thing was right or wrong, to act regardless of personal consequences.

A Study of Wood Preservatives and Marine Borers

A Description of Experiments to Determine Effectiveness of Creosote Oils in Preventing Attacks on Piling

By C. H. Teesdale

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L. F. Shackell

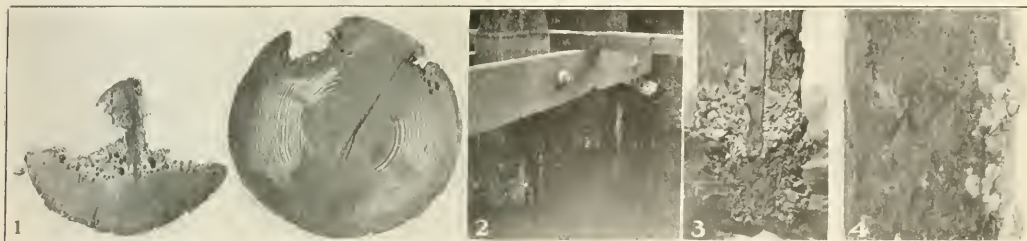
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IT is impossible for one unfamiliar with marine shipping to appreciate the immense annual losses occasioned by the attacks of marine borers against wooden structures—boats' bottoms, harbor piling, and so forth. In the worst infested regions of the Atlantic, Pacific and Gulf coasts unprotected piling will not, as a rule, stand up for more than a single season. The economic losses do not stop with the destruction of wooden structures; for in certain situations their replacement often involves tedious work and much more expense than does their original installation. For instance, it is not infrequently necessary to remove a section from the roof of a warehouse in order to replace destroyed foundation piling.

For hundreds of years search has been made for an efficient protective against the attacks of marine borers. Dur-

ing a considerable portion of the wharf from which it was taken. In this last case the piles were exposed to the weather on the bank for one year before being driven, which may have been responsible for the short life in service.

There is an element of uncertainty in all except, perhaps, the heaviest treatments. Coal-tar creosote is a highly complex mixture of organic compounds (no two creosote oils being identical in composition), and methods of analysis are limited mainly to fractional distillations carried out under arbitrary conditions, together with determination of a few physical constants. Furthermore, it has not been known whether the effectiveness of a creosote oil against marine borers is due to its toxic constituents, to its viscosity, to high-boiling, practically non-volatile compounds, or to some combination of the foregoing. The development within recent



(1) Section of a Creosoted Longleaf Pine Pile Destroyed by Teredo at Gulfport, Miss. Left-hand Section Taken at Surface of Water and Right-hand Section Taken at Mud Line. (2) Creosoted Longleaf Pine Piles Badly Damaged by Teredo After Four Years' Service at Gulfport, Miss. (3) Creosoted Longleaf Pine Pile Badly Attacked by Sphaeroma After 12 Years' Service at Mayport, Florida. (4) Section of Creosoted Longleaf Pine Pile After 4 Years' Service at Brunswick, Ga.

ing the past 50 years the use of creosote oils, particularly those obtained from coal tar, has made great headway; until at present impregnation under pressure with coal-tar creosote may be considered a standard method of preserving piling. This method is, however, expensive, and its effectiveness by no means invariable. For example, 12 years is about the average life obtained from piling given an 18-lb. treatment and installed at Pensacola, Fla., and it is the practice of one of the railroads to use a tile protection around creosoted piles where renewals are very expensive. The sections in Fig. 1 were taken from a creosoted longleaf pine pile destroyed by *xylotrya* at Gulfport, Miss., and removed in 1913 after 11 years' service, the cause of failure probably being uneven penetration; Fig. 2 shows the condition of wharf piling at the same place after four years of service, and is typical of about 50 per cent of the piling in the structure driven at the same time. Fig. 3 shows a pile badly damaged by *sphaeroma* at the mouth of the St. Johns river at Mayport, Fla., after 12 years' service. It was in somewhat worse condition than the average piles in the structure of which it is a part. Fig. 4 shows the condition of creosoted longleaf pine piling after four years' service at Brunswick, Ga. This pile shows heavy attack by *limnoria* in the creosoted portion, and is typical of

years of a ready market for individual constituents of creosote—the phenols, naphthaline, tar bases, and so forth—has led to the widespread use against marine borers of oils from which these constituents have been removed in part so that the composition of the oils must be widely different from that of the straight distillate oils used 20 to 50 years ago, and it is uncertain how the effectiveness of the oils is impaired. It is these oils, however, that have furnished the service data on which the reputed effectiveness of creosote oils in general has been based.

For a number of years the United States Forest Service has been investigating methods of treatment and the efficiency of various preservatives, taking records on actual service tests, in an effort to overcome this destruction of timber by marine borers. At the same time the United States Bureau of Fisheries has been studying the life histories of the various borers. Since 1914, these bureaus have been working jointly on the problem, and have published annual reports of progress made, this being the third such report.

The first series of tests was started in 1911 and 1912 with treated specimens of southern yellow pine, each about six inches in diameter and two feet long. Specimens treated with coal-tar creosote fractions were installed at Pensacola, Fla., Gulfport, Miss., and San Francisco, Cal., and speci-

mens treated with various other preservatives were installed at Gulfport and San Diego. A second series of tests was started by installing additional specimens in 1914 and 1915. The pieces treated with coal-tar creosote fractions in 1911 were given an absorption of 18 lbs. per cu. ft. and the later ones an absorption of 8 lbs. per cu. ft.

SUMMARY OF TESTS IN ALL LOCATIONS AFTER 5 TO 6 YEARS' SERVICE.

Preservative.	No. of specimens.	Condition.					
		No attack.	Very slight attack.	Slight attack.	Medium attack.	Severe attack.	Very severe attack.
Fraction I.....	16	..	..	..	..	..	..
Fraction II.....	16	..	..	..	..	..	..
Fraction III.....	16	..	..	..	..	..	..
Fraction IV.....	16	..	..	..	..	..	..
Fraction V.....	16	..	..	..	..	..	..
Coal-tar creosote.....	20	..	..	..	..	..	..
Copperized oil.....	8	..	..	..	..	..	..
Water-gas-tar creosote.....	8	..	..	..	..	..	..
Hardwood tar.....	8	..	..	..	..	..	..
Timber asphalt.....	8	..	..	..	..	..	..
Untreated.....	24	..	..	..	..	..	..

Comparing the results obtained on the five fractions of creosote, it was noted that there was a progressive increase in resistance to attack as the boiling point of the preservative was raised. Thus, all of the specimens treated with Fraction I were either severely attacked or destroyed, while only one treated with Fraction V was destroyed. Those treated with coal-tar creosote were about comparable to those treated with Fraction IV. The high boiling water gas-tar creosote was almost as effective as coal-tar creosote. Of the other preservatives used, copperized oil, hardwood tar, timber asphalt, and Spiritine were not at all effective. Hence, it is concluded that products of petroleum and of the distillation of hard and soft woods are not effective in preventing attack by marine borers.

The later experiments indicate that low boiling water gas-tar distillates are ineffective. Zinc chloride or copper salts added to crude oil were of little value, while ferric chloride or copper salts added to creosote considerably increased the resistance, especially to limnoria attack. Naphthalene added to creosote decreased its resistance to the borers, especially limnoria. While the results indicate that additions of tar to creosote reduced the resistance to attack, this was due to the fact that the tar increased the difficulty of penetration, and, with the low 8-lb. absorptions, resulted in narrow poorly penetrated strips near the surface, in which the borers obtained a start. Where the specimens were well treated, the general surface conditions indicated that tar increased the resistance to attack to a considerable extent. Ferric acetate solutions were of no value.

The shipworm, xylotrya (often confused with a less common relative, teredo), is perhaps the most destructive borer in American waters, and though a microscopic organism at the time of its entrance into a piece of wood, it may attain a length of several feet and a diameter of an inch. Widely different from this mollusc is the tiny crustacean borer, limnoria, which rarely attains a length above one-eighth inch, and yet because of vast numbers is fairly destructive. In spite of the great structural differences between these two forms, their reactions toward creosote poisons were strikingly similar. This was determined from the following summary, which applies equally to both xylotrya and limnoria. Over 1,000 specimens of xylotrya and more than 12,000 limnoria were used.

The preparations investigated consisted of the creosote and creosote fractions used in the above described service tests; a series of creosote light oils; a series of tar acids; a series of tar bases, and a series of crystalline coal-tar hydrocarbons. The light oils tested were benzol, toluol and a mixture of the isomeric xylols. The tar acids consisted of

phenol, orthometa—and para-cresols and alpha—and beta-naphthols. The samples of mixed tar bases consisted of four fractions obtained by the Hempel distillation of crude bases. The temperature limits of these distillates were, respectively, 94 to 167 deg. C., 170 to 210 deg., 210 to 250 deg., and 250 to 315 deg. Experiments were also made with a sample each of pure pyridine and of synthetic quinoline. The crystalline hydrocarbons studied were naphthalene, acenaphthene, phenanthrene and anthracene.

1. The toxicity of creosote fractions *decreases* as the boiling point rises; that is, the creosote and its distillates, arranged in the order of decreasing toxicities, are: Fraction 1, fraction 2, creosote, fraction 3, fraction 4, fraction 5. The high toxicity of fraction 2, which was solid with naphthalene, was probably due mainly to tar acids.

2. The creosote light oils are definitely poisonous to the borers. Benzol is the most, and xylol the least toxic. The toxicity of toluol lies between these two.

3. The tar acids are all highly poisonous to the borers. Their toxicity steadily *increases* with a rise in molecular weight; that is, arranged in order of increasing toxicity, they are: Phenol, the cresols and the naphthols. The three isomeric cresols, which exert practically the same degree of toxic action, are about twice as poisonous as carboic acid; while the two naphthols, also equally toxic, are ten or more times as poisonous as phenol.

4. Tar-base fractions all show a high toxicity for the borers; and this toxicity *increases* with a rise in the boiling point of the fractions. Pure quinoline, boiling at 239 deg. C., is several times as poisonous as pyridine with a boiling point of 115 deg. The toxicities of the tar bases are fairly comparable with those of tar acids of approximately the same boiling points.

5. In comparison with the tar acids or bases or even the lighter hydrocarbon oils the solid hydrocarbons of creosote are only very slightly toxic. Arranged in the order of decreasing effectiveness, they are: naphthalene, phenanthrene, acenaphthene and anthracene. Naphthalene is perhaps five times as toxic as anthracene.

It has apparently been assumed that the more poisonous a creosote oil is the more effectively will it prevent attacks of marine borers. It will be noted, however, that the conclusions drawn from these direct toxicity tests, especially with reference to creosote and its fractionates, are diametrically opposed to the conclusions drawn from the service tests above; that is, the highest boiling fraction, which was the least poisonous, stood up the best in actual service. But it does not follow that some of these observations must be inaccurate, nor that toxicity is not a factor in the preservative action of creosote oils. It seems worth while to consider this point in some detail, if only to show how involved is this problem of marine borers.

The data for the first six preservatives indicate that the practical efficiency of these preservatives is a function of the high-boiling constituents that each contains. For example, Fraction I, which was the least effective, had a residue above 225 deg. C. of 8.1 per cent; whereas Fraction V, the most effective, had a residue above 320 deg. C. of 89.8 per cent. Coal-tar creosote, with an efficiency between that of its lowest and its highest-boiling fractions, had a residue above 320 deg. C. of 25.8 per cent. Now, it is not improbable that the high-boiling, relatively non-volatile constituents tend to prevent the loss of lower boiling, poisonous substances. With such an assumption, it is easy to reconcile the apparently conflicting results of the service tests and the toxicity experiments.

Although the writers are convinced that the proportion of high-boiling constituents in a creosote oil is a large factor in determining its value for marine work, they are also inclined to believe that other though more obscure factors may

play an important part. It seems possible, for instance, that the tar acids and bases, which were found to be the most poisonous constituents of creosote, may be combined chemically in a creosote to form relatively non-poisonous compounds. Another and perhaps more reasonable assumption is that the high-boiling acids (e. g. naphthols) and bases (e. g. quinolines), which are readily miscible with high-boiling neutral creosote oils, but only slightly soluble in sea-water, will be found to have a very low coefficient of distribution between the neutral oils and the sea-water in comparison with lower boiling acids (e. g. phenol) and bases (e. g. pyridine), which are much more soluble in sea-water. The writers expect to test these assumptions experimentally in the near future.

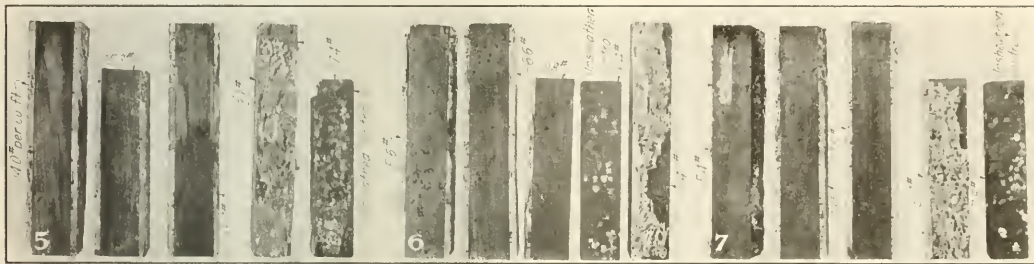
Users of creosoted piling have been greatly puzzled occasionally on observing shipworms boring through heavily creosoted wood. The writers have themselves seen this; but on following the burrows back, have very frequently found that the point of beginning the attack was at a spot which had received, if any, only very superficial treatment. These observations furnished the basis for a series of service tests to determine whether shipworms would pass from untreated into treated wood; and, if so, whether the type of treatment would determine the extent of their attack.

Rectangular sticks of sap loblolly pine, about 3 in. by 3 in. by 36 in., finished on all sides, were treated at the

5 to 7. The last shows that naphthalene, alphanaphthol, phenol and benzol, in the proportions in which they were present, were ineffective in these service tests. Perhaps the most striking point, however, about these tests was the fact that in each of the sheathed specimens treated with creosote or its fractionates the borers passed from the untreated sheathing into the cores; whereas the unsheathed controls in this group were unattacked.

The interpretation of these unexpected results lies in the peculiar life history of the shipworm. The latter invariably begins its attack on wood as a free-swimming larva, microscopic in size. At this time it is readily killed by traces of poisons which may leach slowly from the surface of unsheathed creosoted specimens. But when such a larva has once obtained a foothold in the wood, it undergoes a radical metamorphosis and grows with great rapidity, so that it may attain a size thousands of times that of its larval state in two or three weeks. This great increase in size is accompanied by a corresponding increase in resistance to creosote poisons; so that shipworms, which by some chance have obtained a foothold, may ultimately be enabled to burrow with apparent impunity through heavily treated wood.

The value of high-boiling coal-tar creosote oils for this purpose may be considered as established, but further investigation is necessary to establish the value of specifying high-boiling acids and bases in oils for marine work. A



(5) Sheathing Experiments. Heavy Treatments With Most Toxic Creosote Distillate—Fraction 1. No. 5 Unsheathed Control. Sheathing Practically Destroyed. Attack on Treated Cores, Though Definite, Is Rather Superficial. No Sign of Attack in No. 5. (6) Light Treatments, With Straight Creosote of Medium Toxicity. Depth of Borings Average $\frac{1}{4}$ inch. No. 4 Not Attacked. (7) Light Treatments with Least Toxic Creosote Distillate—Fraction 5. Attack on Treated Cores Fairly General, But For Most Part Extremely Superficial. No Sign of Attack in Unsheathed Control.

Forest Products Laboratory with creosote I and the several fractions. A series of treatments was also made with special preparations as follows: (a) Benzol, 90 per cent; (b) re-sublimed naphthalene, 25 per cent, in gas oil; (c) pure phenol, 5 per cent, in gas oil; (d) alphanaphthol, 1 per cent, in gas oil; (e) gas oil. After treatment the majority of the sticks were sheathed completely with untreated half-inch sap pine boards secured from the same source as the treated wood. The sheathing was surfaced on the side in contact with the treated core, and was secured to the latter with brass screws. One specimen in each treatment was left unsheathed as a control. The purpose of the sheathing was merely to serve as bait for the microscopic free-swimming shipworms, and later as shelter for the borers until they should attain a size sufficient to render them easily observable. The main object of these experiments, however, was to study the reactions of the borers on reaching the treated cores.

The specimens were shipped to the U. S. Fisheries Station, Beaufort, North Carolina, and were installed in Beaufort Harbor in the middle of June, 1915—about five weeks after treatment. They were allowed to remain in the sea-water for six months, and were then taken up and examined.

The results of these tests are illustrated in part in Figs.

liberal content of acids and bases would do no harm, and if these results have practical significance, they strongly indicate that they would increase the effectiveness of an oil.

The following specifications were adopted at the 1917 convention of the American Wood Preservers' Association and provide a distillate oil containing more high-boiling constituents than any previously adopted for use in pressure treating plants. While it was intended for treating paving blocks it is also the best specification thus far adopted that could be used for piling. Such an oil need be used only in the most heavily infested waters. At least 22 lb. per cu. ft. should be injected.

The oil shall be a distillate of coal-gas tar or coke-oven tar. It shall comply with the following requirements:

1. It shall not contain more than 3 per cent of water.
2. It shall not contain more than 0.5 per cent of matter insoluble in benzol.
3. The specific gravity of the oil at 38 deg. C. shall be not less than 1.06.
4. The distillate, based on water-free oil, shall be within the following limits:
 - Up to 210 deg. C. not more than 5 per cent.
 - Up to 235 deg. C. not more than 15 per cent.
5. The specific gravity of the fraction between 235 deg.

and 315 deg. C shall be not less than 1.02 at 38 deg./15.5 deg. C.

The specific gravity of the fraction between 315 deg. and 355 deg. C. shall be not less than 1.10 at 38 deg./15.5 deg. C.

6. The residue above 355 deg. C., if it exceeds 10 per cent, shall have a float-test of not more than 50 seconds at 70 deg. C.

7. The oil shall yield not more than 2 per cent coke residue.

8. The foregoing tests shall be made in accordance with the standard methods of the American Wood Preservers' Association.

SUMMARY

1. The economic losses due to the activities of adult shipworms can never occur as long as treatments of wood for marine structures are able to prevent attack by the microscopical and apparently insignificant shipworm larvae.

2. Heavy treatments with a proper type of creosote will still prove inadequate as long as areas of superficially treated sapwood, heartwood, knots, and so forth, are left exposed for the lodgment of shipworm larvae.

3. It appears that a proper creosote oil for marine work should contain a large proportion of constituents boiling above 320 deg. C., as well as considerable amounts of high-boiling tar acids and bases.

SAFETY AT HIGHWAY GRADE CROSSINGS

The general use of cautionary highway crossing signs (corresponding to distant signals on railroads), the most notable improvement that has been made in crossing safety for many years, is now provided for by law in eight states, namely: California, Connecticut, Illinois, Maine, Massachusetts, New Hampshire, Oklahoma and Vermont.

This and other interesting information concerning grade crossings and trespassing may be found in the report of the committee on these subjects, which was presented at the meeting of the National Association of Railway Commissioners at Washington, October 16. Bills providing for the signs have been presented to the legislatures in a number of other states. Most or all of the laws which have been passed contemplate the fixing of these signs at 300 feet from the tracks. New Hampshire, which was the pioneer state in this matter, reports that the cautionary signs are already in use, but that they are not of the same design as that later adopted or approved by the association. In Vermont the situation is similar to that in New Hampshire. In Connecticut the sign must be furnished by the railroad, but will be set by the city or town. In California, the law requires vehicles approaching grade crossings of railroads to run not faster than 15 miles an hour. Tennessee has a law requiring drivers of automobiles to come to a full stop before crossing tracks. Texas requires them to slacken to six miles an hour at all crossings except those protected by gates or flagmen. The State of Washington has passed a law requiring automobiles carrying passengers to stop before crossing tracks.

The painting of black and white diagonal stripes on crossing gates, and the use of disks instead of flags by crossing watchmen are now regular practice on many railroads in many states.

This report is the most comprehensive review of the grade crossing question which has come to our notice. As to protection of crossings it refers to the action of the association last year, which resulted in joint action (through committees) with the American Railway Association, and the adoption of important standards. On the subject of elimination of grade crossings the report summarizes some figures which show the enormous magnitude of this problem. There are, in 22 states which have replied to a circular, over 110,000

grade crossings. Basing the calculation on the data received, the committee estimates that in the whole United States there are 200,000 grade crossings; and that at these crossings about 2,000 persons are killed each year. In the 22 states reporting, it appears that only ten per cent of the crossings are protected by gates, flagmen or bells. In a number of states a good deal of progress has been made in the elimination of grade crossings. The leaders in this movement are Connecticut, Illinois, Massachusetts, New Jersey, New York, Oklahoma, Oregon, South Carolina and Wisconsin. Massachusetts, with only about 2,000 miles of railroad, has spent, since 1890, about \$42,000,000 on this work. In Illinois, the work, not begun so early, has involved the expenditure of \$55,000,000, a large share of which was spent within the city of Chicago. New York, with four times as many crossings as Massachusetts, has spent only a little more money, namely, \$44,000,000.

Estimates of what it would cost to eliminate all of the crossings in a state are made in a few cases, running up into the hundreds of millions, of course. In California, the estimate averages \$30,000 to each crossing; in Colorado, \$40,000; in New York, \$48,000, and in Wisconsin, \$25,000.

The committee thinks that every state ought to have a law requiring railroad companies to make some progress in the elimination of crossings every year; and, generally speaking, it is believed that the cost should be divided about equally between the railroads and the public, as is the case in New York. The laws, action and policy of the several states in regard to the elimination and protection of highway grade crossings are set forth in a full abstract, filling 26 pages of the committee's report.

Trespassing, which subject was added to the committee's field of work last year, is treated briefly, attention being called to the fact that the only point of contact between grade crossings and trespassing lies in the fact that the crossing makes the rights of way of the railroads easily accessible to trespassers. The lack of respect for railroad property, which developed in many communities in the early days, still remains; and the American record in the matter of trespassing on tracks is disgraceful. Many states have no adequate laws forbidding trespassing on railroads, and in the thirteen states which have such laws it is common knowledge that trespassing has not been stopped.

The committee sent out a circular of inquiry and found that only in four states do the laws forbid trespassing on rights of way, as distinguished from trespassing on trains; and only one state, Pennsylvania, claims that the laws are strictly enforced. The replies to this circular are summarized in tabular form in an appendix. The almost universal neglect of the statutes on this subject leads the committee to say that the outlook is discouraging. The railroads are fully alive to the situation, and in many cases have been exceedingly active, endeavoring to prevent trespassing; but the public authorities are indifferent. There is a widespread belief that anti-trespass laws are passed at the behest of the railroads, not to protect human lives and limb, but to protect railroad property, and to permit corporations to infringe or seek to infringe upon the liberty of the individual. An educational campaign is necessary to dissipate this erroneous notion.

The committee recommended the passage of federal legislation to eliminate trespassing, but the convention did not adopt the recommendation. The committee thinks that a statute could be framed which would be enforceable either by the federal authorities or by state and local authorities. Aside from this, about all that can be done is to continue the present efforts at publicity and general education of the people. The chairman of this committee is James Blaine Walker, New York Public Service Commission, New York City; and the other members are R. C. Bacon, C. C. Elwell, Alex. Gordon, F. J. Miller, John G. Richards, and B. W. Waltermire.

Priority Regulations for Railway Materials

The Methods of Procedure in Securing Supplies and the Extent to Which They Will Affect the Railroads

BECAUSE of the unprecedented demand of the various government departments for iron and steel and their products, for ships, docks, munitions and other supplies for the army and navy, and for construction and other purposes in connection with the war, and because of the unusual needs of the railways and other industries for work urgently necessary in carrying on the war, together with the certainty that non-essential demands on the available capacity must in part, at least, be subordinated to the most urgent requirements, it has been necessary to devise a system of priority to determine the relative precedence in which orders shall be filled.

The determination of relative priority has been placed in the hands of the Priorities Committee of the War Industries Board of the Council of National Defense, located at Washington. Judge Robert S. Lovett, chairman of the executive committee of the Union Pacific, is chairman of this committee and has also been appointed by the President as director of priority of transportation, to administer the powers conferred upon the President by the priority of shipments law. The other members of the committee are: Major General J. B. Aleshire, George Armsby, Rear Admiral N. E. Mason, Edwin B. Parker, J. Leonard Replogle, Rear Admiral A. V. Zane, and R. T. Demsey, executive secretary.

The operation of the priority system must inevitably have an important bearing on the work of railway supply companies and upon even the operation and maintenance of the railways as well as upon their plans for improvements, because the scarcity of materials and supplies necessary to railway work is such that it will be necessary to secure priority orders in order to obtain what is required and precedence must be given to the orders and to the work deemed most essential to the successful prosecution of the present war.

The Priorities Committee has recognized the indispensable character of the service being performed by the railways and has generally followed the practice of classifying requests for priority for railway materials as next in importance to actual war orders.

Directions prescribing the principles to be followed in determining priority were made public in Circular No. 1 issued by the Priorities Committee on September 21, giving instructions as to priority in orders and work for all individuals, firms, associations and corporations engaged in the production of iron and steel and in the manufacture of products thereof. About 25,000 copies of this circular were sent to manufacturers in all parts of the United States, requesting them thereafter to observe the regulations and to give priority in accordance with certificates to be issued by the committee. The circular was signed by Judge Lovett and was approved by the Secretary of War and of the Navy.

Heretofore applications for priority orders have been made direct to the Priorities Committee, but the subcommittee on materials and supplies of the Railroads' War Board, H. B. Spencer, vice-president of the Southern Railway, chairman, which has been keeping in close touch with the work of the Priorities Committee with reference to railway materials and has also conducted investigations as to the needs of the railways for materials and supplies, has now developed a plan by which applications by railroads for priority certificates for work in which they are interested will be sent direct to the office of the subcommittee in Washington and will be handled by it with the Priorities Committee.

The general plan of the priority system is described in Circular No. 1 as follows:

DIRECTIONS AS TO PRIORITY

During the war in which the United States is now engaged, all individuals, firms, associations, and corporations engaged in the production of iron and steel and in the manufacture of products thereof are requested to observe the following regulations respecting priority, viz.:

1. All orders and work shall be divided into three general classes, Class A, Class B, and Class C, with various subdivisions of Classes A and B, indicated by a suffix number, thus: Class A1, A2, A3, A4, etc., and Class B1, B2, B3, B4, etc.

2. Orders and work in Class A shall take precedence of orders and work in both Class B and Class C, and orders and work in Class B shall take precedence of orders and work in Class C, irrespective of the date the orders were received; and orders and work in Class A1 shall take precedence of orders and work in Class A2, etc., and Class B1 shall take precedence of Class B2, etc.

3. Class A comprises war work: that is to say, orders and work urgently necessary in carrying on the war, such as arms, ammunition, ships, etc., and the materials required in the manufacture of same.

4. Class B comprises orders and work which, while not primarily designed for the prosecution of the war, yet are of public interest and essential to the national welfare, or otherwise of exceptional importance.

5. Class C comprises all orders and work not embraced in Class A or Class B, and no certificate of the Priorities Committee will be required therefor. Any order for work or material not accompanied by a certificate in substantially the form set forth on page three of this circular, to the effect that the work or material falls within Class A or Class B, should be treated as an order for work in Class C.

6. All materials required in the manufacture of an article or in the prosecution of any work will be entitled to take the class of such article or work unless otherwise specified in the certificate covering the same.

7. Certificates in the form set forth on page three of this circular will be issued by the Priorities Committee upon application therefor, specifying the classification of the order or work, and priority should be given accordingly in producing and furnishing the material or supplies, or in manufacturing and delivering the article. Certificates of a subsidiary nature will be issued upon request for the furnishing of material and articles required in manufacturing the article or prosecuting the work ordered.

8. All orders placed prior to the date hereof by or on behalf of the War Department or Navy Department of the United States or the United States Shipping Board Emergency Fleet Corporation should be classed as subdivision A1 of Class A, unless otherwise ordered by the officer placing the order or by the Priorities Committee; and all orders for arms, ammunition, and other military supplies and equipment placed prior to the date hereof by or on behalf of the nations associated with the United States in the war in which it is now engaged should be classed as subdivision A2 of Class A unless otherwise ordered by the Priorities Committee.

9. All orders placed after the date hereof should be classed as Class C unless covered by certificates of the Priorities Committee or other written directions of the said committee.

The form of application for a principal Class B priority certificate (Form P C 7) is as follows:

[illegible]

(e) Applications (Form P C 9) for subsidiary certificates covering materials, articles, or work required in the manufacture of articles or in the prosecution of work in connection with which a principal Class B certificate shall

The first concern of the committee has naturally been to secure expedited delivery of the vast supplies of materials urgently required to fill government orders or to make it possible for some subsidiary contractor to proceed with work needed to complete government orders. To a considerable extent the paramount needs of the government have resulted in delaying or setting aside orders placed by the railways or have made it impossible for companies holding contracts from railways to secure materials required to fulfill their contracts. In some cases railways have voluntarily postponed their own requirements to give way to

work considered more urgent. In the case of locomotives precedence was given by direction of the Secretary of War, before the priority system was put into effect, in the following order: For the United States government, for the French government, for the Russian government, and for American railways. Of 968 locomotives turned out by the builders between June 1 and the first part of October, 353 were for the United States or foreign governments, and of the 4,120 locomotives on order, 2,490 were for the United States or foreign governments.

However, since the priority plan has been put into effect recognition has been given to the necessity of keeping the railways in a condition to meet the demands upon them for transportation and railway materials in general have been considered as entitled to Class B 1 rating, providing the reasons for requesting priority justify such a rating in each particular case.

This is the highest rating that can be given to anything which is not included under the head of actual war work.

All applications are passed on individually, however, and

sub-contractor or concern that furnishes some of the contractor's supplies necessary for the completion of the principal contract.

For example, a road that has ordered cars, delivery of which is delayed by inability of the car builder to obtain steel, might ask for a principal certificate for the car builder. The latter in turn, if given a principal certificate, might then request a subsidiary certificate to enable the company from which it must obtain some of the car equipment to secure raw materials. Possibly the completion of an order for cars might be delayed by the difficulty of securing some comparatively unimportant item of equipment. If a priority order covering a comparatively small amount of work would enable the cars to be put into service promptly a Class B1 order would undoubtedly be issued, and the fact that actual war orders were given precedence would not necessarily delay the work until the war orders were completed if the B1 order could be worked in with them. On the other hand, if a steel mill had delayed delivery of plates to a car builder in order to complete an urgently needed order for the War Department or the Shipping Board the cars might be delayed. If a railroad needed materials to complete a signal installation and could show that it was handling a large volume of war traffic which would be facilitated by the signal installation, it would have no difficulty in securing a Class B1 order, but if the road were not able to show that the signal installation would directly expedite war traffic or if the equipment was desired for a road which would not be completed for some time a lower rating would undoubtedly be given.

The sub-committee on Materials and Supplies has recently reported that railways generally have been obtaining sufficient metal for their needs, except that there have been some delays, particularly as to rail.

WASHINGTON CORRESPONDENCE

WASHINGTON, D. C., October 31.

An unmistakable war order pertaining to transportation, one that will curtail if not eliminate industries and operations not considered essential to the winning of the war, was issued by Judge Lovett, the priority agent on October 27.

It requires all railroads, beginning November 1, to deny the use of open top cars, except platform cars and cars in work service, for the transportation of materials and supplies, other than coal, for the construction, maintenance, or repair of public or private highways, roadways, streets or sidewalks; for the construction, repair or maintenance of theatres, or other buildings to be used for amusement purposes; materials and supplies, other than coal, for the manufacture of pleasure vehicles, furniture or musical instruments; or for the transportation of passenger vehicles, furniture or musical instruments.

This limitation upon the use of gondolas, President Wilson has been convinced, is necessary for an augmentation of the coal supply. For the lack of coal to keep her ammunition factories going, Italy is now being forced to relinquish the Austrian territory which she conquered in May and August.

It is estimated that by forbidding the uses named, the coal movement can be increased 600,000 tons a week. The testimony which caused the President to authorize the issuance of the order tended to show that coal production is being kept down by the inability of the railroads to provide more cars, and that that inability resulted from the carelessness of some railroad officers, and from the obstinacy of consignees who, notwithstanding protests, loaded out coal cars which they had emptied instead of allowing them to be returned without delay to the mines.

The order, by its terms, suggests that the open-car com-

Principal Certificate No. B to be held by who requests that Subsidiary Certificate

Issue to

APPLICATION FOR SUBSIDIARY CLASS B PRIORITY CERTIFICATE

..... 191

Priorities Committee, War Industries Board,
Council of National Defense, Washington, D. C.

GENTLEMEN:

You are hereby requested to issue a Class B Priority Certificate subsidiary to your Principal Priority Certificate, No. B, the requested Subsidiary Priority Certificate to cover an order or contract dated for

placed with for delivery

The execution of this order is necessary for the completion of the contract undertaken by this applicant for which the above-mentioned Principal Priority Certificate was issued for the reasons following:

.....

Yours truly,

(Contractor holding Principal Priority Certificate No. B)

Form PC 1 (7)

rated according to their merits, so that a request from a road that could show that the materials were needed for a purpose that would have a direct effect in enabling it to handle war traffic would be classed as of greater importance than a similar request from a road that could not show so direct a connection with a war emergency.

A railroad which has placed contracts for materials, supplies or equipment, delivery of which has been delayed by inability of the contractor to obtain needed materials or parts, applies for a principal certificate covering its contract, giving the reasons why it is needed and stating that it is able to secure the needed materials, supplies or articles only by being accorded priority. After a principal certificate has been issued the contractor may in turn request a subsidiary certificate covering materials that may be needed by some

modities at present deemed most important are coal, coke, ore, limestone needed in blast furnaces, sugar beets, sugar cane, sorghum and other raw materials for use in the metal, sugar and fertilizer industries, and other commodities necessary for the national defense and security.

While it is called priority order No. 2, it does not follow the form of No. 1. The first order directs that preference be given to lake cargo coal. This one does not say that the railroads shall give preference and priority to coal, coke, etc. On the contrary, it says they "shall deny the use of" gondolas for the purposes indicated. That language was determined upon only after considerable discussion among the transportation men (who really suggested the limitation). Under an order to give preference, it was suggested by those who advocated the "shall deny" form, too much discretion is left with a commercial agent or a yardmaster, who may be anxious to acquire the good will of a big shipper. For illustrative purposes, consider this situation: A manufacturer receives a car of coal. Then he says to the railroad man, "I have a load of paving brick going to Hilltown, ten miles from the mines, and on the direct route to them. I will unload, and load this car before you can get the yard crew to take it away, and I know the bricks will be taken out instantly when it arrives at Hilltown. If you don't let me load them, I'll hold this car 48 hours, and it will not get back to the mines as soon as it will if you allow me to use it for the brick."

The receiver of the coal has a right to hold the car for 48 hours without incurring penalties. Under the terms of the first priority order, the railroad man would have a discretion, perhaps not a legal one, but nevertheless a discretion. Under No. 2, there is no discretion. The railroad "shall deny the use" of open top cars, with the exceptions mentioned, for anything other than the metal, sugar and fertilizer industries and for commodities necessary for the national defense and security.

While the order says "the President has come to the conclusion," etc., the fact is that the transportation men in the Government service are the ones who reached the conclusion and persuaded the President and Dr. Garfield, the Fuel Administrator, to adopt it. Judge Lovett, acting through George W. Kirtley, his executive officer, the members of the Sheaffer committee, and E. H. DeGroot, Jr., and A. G. Gutheim, the commission's division on car service, are the men who devised this plan for so materially increasing the country's coal supply. It is almost a certainty that the order will put a stop to the road-building programs in all the states. Ohio, according to the information reaching Washington, has been using 6,000 cars of road-building materials every week. Another bit of information upon which the car service men worked is that a big automobile manufacturer shipped 60 per cent of his output in coal cars.

The order will be enforced to the letter. If the interdicted industries and operations can survive by using other kinds of cars, they may continue during the war, but not otherwise. Inasmuch as the President's power to grant preferences and priorities is undisputed, it is believed that the method by which he accomplishes the result will not be scrutinized with fault-finding eyes by the courts.

Issuance of the second priority order, as distinguished from the lake cargo coal order; the order for the fueling of various railroads and the diversion of lake cargo coal to any preferred destination during the 24 hours beginning at midnight of October 28; and the appointment of two railroad men, G. N. Snider of the New York Central and Arthur S. Learoyd of the Delaware, Lackawanna & Western, made known in Washington on October 25, indicate, it is suggested, a growing recognition by the powers that be, that fundamentally the winning of the war depends on the full utilization of American railroads. Mr. Snider is to be the

head of the Fuel Administration's transportation department, and Mr. Learoyd is to have charge of the distribution of anthracite coal.

ADVANCED RATE PROCEDURE

The Interstate Commerce Commission, on October 27, consolidated the various investigation and suspension cases created by the tariffs filed immediately after the decision in the Fifteen Per Cent case, canceled the hearings therein, and set them down for hearing in connection with the re-opened Fifteen Per Cent case, technically known as Ex Parte No. 57. What, if any, particular meaning is to be attached to this consolidation is not very clear. There have been intimations that the Commission, in re-opening the Fifteen Per Cent case, intended to take the initiative in that matter out of the hands of the Eastern carriers and keep the proceeding under its own control. How accurate an appraisal of what is in the recesses of the minds of commissioners that may be has not been disclosed. George Stuart Patterson suggested the consolidation and postponement of hearings until such time as the carriers might complete more satisfactory tariffs, about sixty days from the time when he was speaking, October 17. There can be no detailed hearing on any of the suspension cases, six in number, on November 5, the day set for the hearing in the re-opened case. Details can be given in only one, a hearing for which was set on November 1. No time for detailed justification has been allowed in the others. The most that can be said is what has already been told the old suspension board, now known as the Fifteenth Section Board, namely, that some of the tariffs in question overcome the objections set forth in the report on Ex Parte No. 57 as to the destruction of market relationships, and that a fair reading of the reports in the big case and the Central Freight Association decision, authorize the others. About the only other showing that can be made is that expenses are rising much faster than revenues; that net earnings are decreasing and the return on property investment is smaller than ever because large additions have been made to capital.

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Photo from Underwood & Underwood, N. Y.

Transporting Wounded Men on Light Railway—British
Official Photograph from the Western Front

Erie Barge and Car-Float Service at Chicago

The Completion of a New Freight House Marks the
Close of Four Years of Successful River Transportation

THE recent opening of a new freight station on the Chicago river at Webster avenue, constitutes a valuable addition to the Erie's facilities for handling eastern business by barge and car float between their rails and the northern section of Chicago. It is also an indication that the river service inaugurated by the Erie four years ago is increasing in scope and importance. The main freight terminal at Fourteenth and Clark streets was then disadvantageously situated for the solicitation and handling of

Under conditions existing prior to the summer of 1913, it was necessary for the shipper and receiver of l. c. l. freight over the Erie to team to the road's freight house at Fourteenth and Clark streets, on the south side of the city, to the universal freight stations of the Illinois Tunnel Company in the loop district or to stations of terminal roads on the southwest and west sides. An additional disadvantage lay in the fact that six of the universal freight stations handled outbound l. c. l. freight only. All of these stations were at



Float Bridge at Webster Avenue
Tug and Car Float at Erie Street
New Webster Avenue Station

Tug and Barge at Erie Street
Tug Landing Car Float at Float Bridge
Gasolene Locomotive Working at Erie Street

traffic consigned to and originating in the north and north-west sections of the city. In order to compete more effectively with other roads, it decided to extend its terminal facilities into that field by utilizing the river. The construction of river freight stations and the launching of a barge and car float service was a new venture for a railroad in Chicago, but a steady increase in business ever since the inception of the service has justified the judgment of those who advocated that means of entering this territory.

such a distance from the northern and northwestern sections of the city as to discourage l. c. l. traffic over the Erie. The road was also handicapped in the solicitation of carload traffic, for although freight routed over the Erie could be shipped to or from the north side by way of connections, it had to undergo the delay incident to switching across the city and passing through interchange yards.

The first river freight station, known as Erie street station, was opened at Erie and Kingsbury streets in August,

1913; in the following month a station was opened on a site at Market and Washington streets, known as Market Square station, which had previously been used by the Erie Railroad Lake Line. It was not until May 1, 1915, that the first Webster avenue station was opened. For a time the Erie rented a float bridge at Robey and Twenty-seventh streets, where cars were transferred to and from its rails, but later a float bridge was constructed by the Erie at Eighteenth street, close to its Fourteenth street freight house, shortening the river haul.

The river service has not only proved attractive to shippers and receivers in the north and northwest sections of Chicago, but has been taken advantage of by industries with dock facilities located on the river. All kinds of all-rail freight, except coal and coke, both in c. l. and l. c. l. lots, are handled at the freight stations, while river industries may ship or receive freight in quantities of 10,000 lb. or more. At present the Erie's river equipment consists of two tugs, four car floats and five barges. Two of the floats have a capacity of four cars each and the two others have a capacity of eight cars. The barges carry from five to six carloads of break bulk freight each, according to the commodities loaded. The tugs operate both day and night.

The Market Square station was abandoned on April 30, 1916, when the lake service was discontinued, so that the Erie has now but two river freight houses. The improvements at Webster avenue, more than compensate for the loss of the station at Market and Washington streets. The new facilities include a brick freight house with a track capacity

livered some time this year, was requisitioned by the government.

The river service has built up a large business for the Erie on the north side of the city, because it has greatly expedited the handling of traffic to and from that territory. There is no longer any incentive for shippers and receivers to favor other roads because of long team hauls through the city to Erie stations, or because of delay to c. l. shipments in switching across the city. In the handling of c. l. freight routed over the Erie fully 48 hours have been saved. In-bound cars are delivered at the river stations on the day of arrival in the city and outbound cars are handled just as quickly. The freight houses have proved especially convenient to certain adjacent industries which formerly had to haul their products considerable distances by team to stations of other roads. Shippers of heavy and bulky products have found the Erie stations especially advantageous. The territory served by the river stations is by no means confined to shippers and consignees in their immediate vicinity, but extends north and northwest to the limits of the city. It is difficult to trace accurately the dividing line between the zones served by the two freight houses, but, speaking roughly, the division may be placed at North avenue, an east-and-west thoroughfare, about a mile and one-half south of the Webster avenue station, and two and a quarter miles north of Erie street station.

The traffic handled on the river includes almost every kind of freight. Among the commodities carried by the barges and car floats for industries with dock facilities are merchandise, cheese, coffee, hides, cocoanuts, beer, canned goods, egg case fillers, sugar, cement, soap, tanners' extract, rubber, bicarbonate of soda and charcoal. Among those handled in carlots at the stations are merchandise, tin plate, caustic soda, hides, matches, paper, leather, wool, barrels, soap, oil, brass, glass, pianos and iron and steel articles.

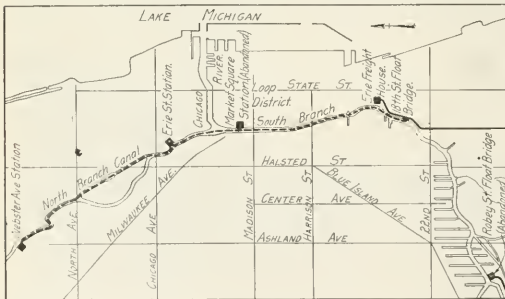
RAILWAY REGIMENTS' TOBACCO FUND BEGINS TO GROW

The railway supply concerns of the country have begun to respond generously to the request for subscriptions to the Railway Regiments' Tobacco Fund. Up to October 31 fifty-two concerns had subscribed \$10 a month each, making a total which had been subscribed of \$520 a month. In addition a contribution of \$25 has been received from the Barco Manufacturing Company, Chicago. In only a few cases have companies made replies declining to subscribe.

While the start made in raising the fund is gratifying, the amount which has thus far been subscribed is, of course, far short of the total which it is desired to raise. In fact, it is only about one-eighth of the fund which is needed, as the estimated cost of an adequate supply of tobacco for all the railway regiments exceeds \$4,000 a month. The committee in charge of the fund, of which F. A. Poor, president of the P. & M. Company, is chairman, therefore hopes that responses to the request for subscriptions will come in more rapidly and in larger number from now on. As previously announced, checks should be made payable to "John R. Washburn, treasurer," and forwarded to "Samuel O. Dunn, secretary, Railway Regiments' Tobacco Fund, Transportation Building, Chicago."

The first list of subscribers to the fund was published in the *Railway Age Gazette* for October 26, page 753. That list included 26 subscribers. The following list gives the subscriptions received between the time of the preparation of the original list and October 30:

Ajax Rail Anchor Co., Chicago.....	\$10 a month
American Flexible Bolt Co., Pittsburgh, Pa.....	" "
Boss Nut Company, Chicago.....	" "
Buckeye Steel Castings Co., Columbus, Ohio.....	" "
Dilworth, Porter & Co., Pittsburgh, Pa.....	" "
Imperial Appliance Co., Chicago.....	" "



Map Showing Location of Erie Freight Houses and Route of Tugs

for 17 cars, carload team tracks for 43 cars, paved driveways leading to the freight house and team tracks from both Webster and Elston avenues, and a float bridge by means of which cars can be transferred to and from car floats. A 15-ton pillar crane will be erected later for the handling of heavy freight. The freight house was formerly used by a manufacturing establishment and has been provided with an initial storage space of about 9,000 sq. ft., with room within the walls for 13,000 sq. ft. more on the ground floor and for the construction of a second floor if increased traffic warrants. The new station replaces a small temporary house.

The facilities at Erie and Kingsbury streets, where the larger of the present stations is located, include a freight house with 37,700 sq. ft. of floor space, a float bridge, a team track yard with a capacity of 19 cars, equipped with a 15-ton pillar crane, house tracks with room for 10 cars, and storage tracks for 8 cars. The freight house fronts on the river, permitting the direct transfer of freight to and from the barges and car floats. Two gasoline locomotives capable of handling 500 tons perform the switching service both at Erie street and Webster avenue stations. A third locomotive of this type for reserve power, which was to have been de-

Interstate Iron & Steel Co., Chicago.....	\$10 a month
Independent Pneumatic Tool Co., Chicago.....	30 "
Morden Frog & Crossing Works, Chicago, (to cover 3 months)	30 "
Madge & Co., Chicago.....	10 a month
Okonite Co., New York.....	" "
Ohio Injector Co., Chicago.....	" "
Paxton-Mitchell Co., Omaha, Neb.....	" "
Pennsylvania Tank Car Co., Sharon, Pa.....	" "
Pratt & Lambert, Inc., Buffalo.....	" "
Q & C Co., New York.....	" "
Rail Joint Company, New York.....	" "
Railway Material Company, Chicago.....	" "
Railway Steel-Spring Co., Chicago.....	" "
Roberts & Schaefer Co., Chicago, (to cover 15 months)	150 "
Wm. Sellers & Co., Philadelphia, Pa.....	10 a month
Sperry, Otis & Co., Chicago.....	" 1 year
Valentine & Co., New York.....	" "
Vapor Car Heating Co., Chicago.....	" "
Vernon Tool Works, Pittsburgh, Pa.....	" "
Whiting Foundry Equipment Co., Harvey, Ill.....	" "

RAIL FAILURE STATISTICS FOR 1916*

By M. H. Wickhorst

Engineer of Tests, Rail Committee, American Railway Engineering Association, Chicago.

This report deals with the statistics of rail failures collected for the year ending October 31, 1916, furnished by the railroads of the United States and Canada in response to a circular sent out by the American Railway Association. The information furnished by each railroad showed the number of tons laid of each year's rolling from each mill, the equivalent number of track miles, and the total number of failures that occurred in each year's rolling from the date laid until October 31, 1916.

The failures were divided into four classes, namely, head, web, base and "broken." The reports cover rollings for 1911 and succeeding years and the ages of the rollings would average in the track about the years shown below:

1911.....	5 years	1914.....	2 years
1912.....	4 years	1915.....	1 year
1913.....	3 years	1916.....	Several months

The tonnages represented by the statistics in this report are shown below:

Year rolled	Bessemer	Open-hearth	Total
1911.....	305,910	810,396	1,116,306
1912.....	303,702	1,254,960	1,458,662
1913.....	135,870	1,503,366	1,639,236
1914.....	63,599	1,936,915	1,999,514
1915.....	12,212	1,080,361	1,092,573
1916.....	33,658	749,765	783,423

The equivalent track miles are as follows:

Year rolled	Bessemer	Open-hearth	Total
1911.....	2,198.87	5,770.54	7,969.41
1912.....	1,448.22	8,812.71	10,260.93
1913.....	969.97	10,365.44	11,335.41
1914.....	452.49	7,052.75	7,505.24
1915.....	90.29	7,291.00	7,381.29
1916.....	259.67	5,093.04	5,352.71

It will be noted that in recent years the Bessemer steel has formed only a small part of the rail rolled as covered by the returns in this report. The failures were tabulated with reference particularly to the performance of the rails made by the different mills. Lots of less than 1,000 tons (that is, less than 1,000 tons in any one year's rolling for a railroad) were excluded from the tabulation, as they would unnecessarily extend the tables and not materially change the group totals and averages.

It is interesting to note the comparative performance of Bessemer and open-hearth rails. Figuring the failures per 100 track miles of open-hearth rails as 100 for each of the years 1911, 1912, 1913 and 1914, the relative failures of Bessemer rails, together with the failures per 100 track miles, are shown below:

FAILURES OF OPEN-HEARTH AND BESSEMER COMPARED

Year rolled	Years service	Failures per 100 track miles		Comparative failures	
		Open-hearth	Bessemer	Open-hearth	Bessemer
1911.....	5	161.9	214.1	100	132
1912.....	4	74.2	107.7	100	145
1913.....	3	43.3	60.1	100	135
1914.....	2	18.9	32.3	100	171

*Abstracted from Bulletin No. 199 of the American Railway Engineering Association.

It will be noted that the failures of Bessemer rails per 100 track miles were considerably greater than those of the open-hearth rails. It is probably also true that the open-hearth rails were, in general, in more severe service, so that the actual difference under the same conditions may have been greater.

The figures indicate that the failures of Bessemer rails occur at a considerably higher rate than the failures of open-hearth rails in their early period of service, but as they remain longer in track, the rates of failure become nearer alike.

In order to show more conveniently the relative number of failures from each of the mills and to show the ranking of the mills as regards the failure performance of the rails rolled by them, a table was prepared. Taking the average number of failures per 100 track miles of all the mills in each group (Bessemer and open-hearth) in any year's rolling as 100, the relative number of failures of each of the mills was shown for the years 1911, 1912, 1913 and 1914. It was interesting to note from the tables and diagram that the mills which had the greatest number of failures some years ago and ranked the lowest are showing a tendency to a considerable reduction in the number of failures and ranking well in more recent years.

COURT TAKES CONTROL OF RATE-MAKING

On March 1, 1916, the Evansville & Indianapolis, running from Terre Haute to Evansville, Ind., 134 miles in length, was placed in the hands of a receiver by Judge A. B. Anderson, of the United States District Court for the District of Indiana. The receiver appointed was William P. Kappes, an attorney of Indianapolis, Ind. The receiver took possession and began to operate the railroad on March 1, 1916. At that date the railroad had no equipment whatever, either engines or cars. Its roadbed was in lamentable condition, being ballasted mainly with dirt, which entailed frequent washouts and large expense for maintenance. Its rails were light; averaging 56½ lbs. to the yard. Its principal bridge, a steel structure across White river, had been carried away by a flood, and the track was temporarily supported on a trestle. There were no funds whatever received by the receiver. Operations were carried on for ten months by renting engines and cars. No net revenue was realized and the receivership ran into debt.

In January, 1917, \$600,000 was borrowed on receiver's certificates and was invested in a partial rehabilitation of the railroad and the acquisition of a small amount of rolling stock. By reason of the great increase in the cost of material and in the wages of employees the savings effected by the rehabilitation were neutralized. The figures of operation demonstrated that in the carriage of coal, which was two-thirds of the traffic of the railroad, there was a continual loss of money, averaging as much as \$13,000 a month and that in the carriage of passengers there was a continual loss averaging \$3,000 a month.

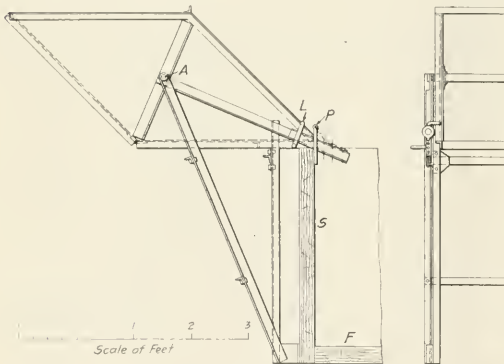
Efforts were made by the receiver to obtain better rates on the carriage of coal by application to the Public Service Commission. These applications were denied by the commission. Thereupon the receiver filed petition in the District Court of the United States setting out the efforts that had been made and the losses that were being incurred and alleging that the two-cent passenger fare law of Indiana was confiscatory of the property of the Evansville & Indianapolis and that the rates enforced by the Public Service Commission were likewise confiscatory. The receiver gave notice not only to all the parties in the case, but to the Public Service Commission of Indiana, the attorney general of the state and the prosecuting attorneys of the counties through which the railroad operated.

The petitions were set down for hearing on October 23 and

on that date were heard by Judge Anderson. An order was entered by the court sustaining the receiver's petition declaring the two-cent fare law of Indiana to be confiscatory, so far as it related to the passenger fares upon the Evansville & Indianapolis, and declaring that the freight rates established by the Public Service Commission of Indiana were confiscatory and invalid so far as they failed to cover the cost of operation, on the E. & I., with a reasonable profit. The order directed the receiver to establish compensatory rates for passenger, freight and switching service, any statute or any order of the commission to the contrary notwithstanding; and in the event that any person should attempt or threaten to bring any action to enforce any penalty on account of said statute or orders of the Public Service Commission of Indiana the receiver was given leave to sue for an injunction.

THE RAPID LOADER

The "rapid loader," shown in the photographic illustration, is a device for saving the time of teams, or trucks, when hauling coal, gravel and similar material from cars. Two "loaders," holding 30 cu. ft. each, filled by hand shoveling while the wagon or truck is away on its preceding trip, can



Details of Loader

be tipped in a half minute each, so as to fill the wagon and to impose practically no delay on the driver and horses.

The loader is made of steel, and is said to be "foolproof." The picture shows it in its normal position, the position in which it stands when it is being filled. It is held in posi-



The Rapid Loader

tion by the pin, *P*, shown in the drawing. This drawing represents the loader attached to a coal car with sides 42 in. high. The perspective view shows it on a car considerably higher. Having been emptied, the pan, turned on the pivot,

A (and held in position, while being filled, by the locks, *L*, one on each side), returns by gravity to the position shown.

This device is made in two sizes: the one most commonly used, No. 2, weighs 340 lb., and holds 30 cu. ft. when level full. To move the loader from one car to another the pan is lifted out from the frame, and the whole is moved in two pieces, no further knocking down being necessary.

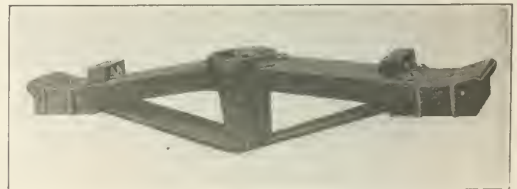
This loader is made by the Bonney Supply Company, Livingston Building, Rochester, N. Y. Contractors say that, using this as a time-saver, they release cars a half day sooner than would otherwise be possible, and it is declared that in some cases not over 300 cu. yd. of crushed stone or gravel had to be hauled before the loader was paid for by the saving in time, over the common practice of shoveling gravel directly into wagons. Shovelers can always see where each shovelful of material is landing, and do not waste time by looking over the side of the car to see whether they are throwing it with the right force and direction to have it land in the wagon. There is no waste of material falling on the ground.

These loaders are used in many places in the United States and have been sent also to France and Haiti. A recent shipment went to Atlanta, Ga., for use at one of the new military camps.

HUNTOON TRUCK BOLSTER

The Joliet Railway Supply Company, Chicago, has placed on the market a new type of truck bolster known as the Huntoon bolster. It is of the built-up type and embodies the same principles of reinforcing the tension member that is used in the tension member of the Huntoon brake beam.

Both the compression and the tension members are of open hearth steel, the compression member being a channel and the tension member a flat bar upset at the ends to retain the full cross sectional area at the rivet holes. The ends of the tension member are provided with shoulders which interlock



Huntoon Built-up Type Bolster

with the web and flanges of the compression member, thus relieving the shearing strain on the rivets. The king post is of malleable iron of heavy cross section. The center plates can be furnished of malleable iron, cast steel or drop forged, as desired. The bolster is adapted to the application of either plain or anti-friction type side bearings.

Tests have demonstrated that this type of construction produces a bolster of great rigidity and strength. Sizes for 30, 40, 50 and 70 ton cars are now being manufactured and the company is prepared to furnish them in any quantities desired.

INDIAN WAR TRAFFIC REGULATIONS.—Under the "Defense of India Act," the Governor General-in-Council has been authorized to give orders for the following purposes: (1) For requiring railways to give special facilities as to the transport of any article or thing which, in his opinion, is capable of utilization in the prosecution of the present war. (2) For enforcing the prompt loading or unloading of cars; and (3) for controlling other trucks and cars, and for controlling other traffic to expedite the transport of such article or thing.

TRADING WITH THE ENEMY ACT AND ITS APPLICATION*

By Hon. William C. Redfield
Secretary of Commerce.

We are not engaged in a contest for material things, for money, or for territory, or for power, or influence, or for a place in the sun; in the last analysis, we are engaged in a conflict against hideous evil in the world, evil enthroned in high places, evil which for its own purposes would willingly take you and yours, which has not hesitated upon our own soil to promote sabotage and slaughter, fire and explosion, and which does not reckon at all human values, if by so doing it may be enthroned in power.

* * *

This is not merely our war, nor the war of Great Britain, nor the war of France, nor of Italy—it is the war of four-fifths of the human race against a wrong which threatens it all.

* * *

Now, commerce is used as a war weapon in two ways. First, it is used to provide the nations associated with us in the war with the means of warfare; and, second, it is used to see that our enemies do not by direction or indirection obtain anything that comes from our shores which we can prevent. There is a third element in it, the element of conservation, which has to do not with economy of money, as I think is too often thought, but with the saving of that of which we have but little, to the use that must be made of it in the war and the using, on the other hand, of that of which we have abundance in its place.

* * *

The principle which lies behind the restriction of exports is the principle of conservation: that our industry shall be so controlled as regards exports that after our own needs are satisfied, what we sell shall be used to support our associates, and what we have left over shall go freely to places where it is safe to have it go and to persons who use it wisely.

That is the simple principle that lies behind the whole question of the restriction of exports.

Now, the restriction of imports is not our own; it is imposed upon us, but we are the beneficiaries. At the bottom of it lies the same reasoning precisely.

* * *

It had to be general in order to be specific. It is not meant to be, it is not at all likely to be exercised in a general way; it means simply that a body—in this case the War Trades Board—shall be authorized to issue licenses to import prohibited products, and shall import them under such restrictions as that they shall be free for our use, but not free for misuse in the sense of being sold to the enemies of the common cause.

* * *

Now, those are the principles which underlie—I think they are very simple, very clear—the restrictions of exports on our part and the restriction of imports of the prohibited articles from foreign countries. They both mean the concentration of the world's power against the evil we are fighting.

* * *

The restriction of the act will exist whether there is any act or not. It is and has long been the law of nations that in time of war all communication with the enemy of all kinds is prohibited. It didn't need this act to make it impropriety, an act of wrong, to sell goods to the German in Germany, or to ship goods to South America, knowing that by that means they would reach Germany, or reach anybody so as to aid

Germany—that is just as strongly forbidden if this act were repealed to-morrow. The prohibitions of the act are not new; they are simply clearly stated and made plain by the language of the law—but they existed before.

The law, then, provides a clarification of these facts making it perfectly plain what trading is, defining it, defining very clearly with whom trading is forbidden; that is to say, defining enemy and defining ally of enemy; but it does not make new law when it does that; it merely states what was the law before.

Then it proceeds to provide a system of licenses whereby anything which is unlawful in the act or without it, of that character can be legalized by a license.

That is the whole and center and substance of the "Trading with the Enemy Act," the restating plainly and definitely of existing law and the providing of licenses to do, under proper circumstances, anything thereby declared to be lawful.

A NOVEL FORM OF CAR EFFICIENCY CIRCULAR

To concentrate attention on the importance of the prompt release and movement of cars, T. D. Simmons, car distributor on the North Carolina division of the Seaboard Air Line at Hamlet, N. C., has been getting out car efficiency circulars weekly for the past eight months. In addition, car detention statements showing the delays to all cars at all stations have been sent to each agent on the division during the last five months. To make these circulars more readable and attractive and thereby secure greater attention for them, recent copies have been issued in newspaper form.

This paper, which is called The Weekly Car News and which has for its aim, "make one car do the work heretofore requiring two," is issued in mimeographed form and contains editorials, the car detention statement, a summarized statement of the average detention, comments regarding delayed car conditions and car service "advertisements."

The following is typical of the editorials: "During the past week we have received a considerable number of penalty orders from the small shippers on the division. This practice must be discouraged. Agents should point out to these shippers the serious situation we are in, . . . and endeavor to show them the unreasonableness of the action in placing penalty orders. State to them we will be compelled to take steps to protect the company in such cases, especially where such shippers as those at ——— order four box cars for government lumber and one for commercial shipment, filing a penalty order for the commercial car, which will have to be furnished first. Any firm with this disposition deserves no consideration and we expect to handle this case with the Norfolk office for further handling with the National Defense Committee."

News items pertinent to the car distribution problem, such as the following, are also published:

A NEW AGENT

Mr. C. C. Birmingham is acting agent at Osborne. The former agent was one who would not order cars for shippers or read our circulars.

Equally to the point are want-ad advertisements such as the following:

WANTED: StL&SF 121548, SAL 45370 and CC&O 2661 loaded with cross ties for the roadmaster, delayed at Hamlet 21 days. These cars wanted for revenue service.

TO EXCHANGE: Slow handling of cars at Wilmington for better car handling.

These news letters have served to emphasize to the agents the importance of the problem of unloading cars promptly and have aided greatly in improving the mileage performances, the average miles made per car per day on this division now being about 49 as compared with 27.1 a year ago.

*Extracts from an address delivered before the New York Editorial Conference, Tuesday, October 13, 1917, at the Automobile Club of America.

General News Department

The annual meeting of the General Managers' Association of Texas will be held at the Adolphus hotel, Dallas, Tex., on December 6.

The Post Office Department announces that the profits of the department for the fiscal year ending on June 30 last amounted to more than \$9,000,000; and that sum has been paid in to the Treasury Department as a contribution to the general fund.

The machine shop and roundhouse of the Chicago & Eastern Illinois at Salem, Ill., were destroyed by fire on the morning of October 25. The explosion of a five gallon can of gasoline is believed to have started the fire and the loss is estimated at \$200,000.

The Interborough Rapid Transit Company, operating subway and elevated railroads in New York City, announces that to all employees who receive less than \$150 a month, bonuses of \$6 a month will be paid. This is an advance of the bonus from \$3 to \$6, the smaller sum having been paid since August 1 last.

In the United States District Court at New York City last week indictments charging fifty-six unlawful acts in connection with concessions in demurrage on boats were found against the Lehigh Valley Railroad, F. E. Signer, general eastern freight agent of that road, and Charles Schaefer, of New York, a shipper.

The Baldwin Locomotive Works, in the week ending October 20 turned out 72 locomotives. This is at the rate of more than 3,600 a year, compared with 1,989 for the year 1916 and 2,666 in 1906, which was the previous record year. The company is employing an army of 20,000 men and work on government orders engages every department.

The station men, freight clerks, and other classes of employees on the Boston & Maine, who have been threatening a strike for several weeks, finally agreed, on October 25, to refer their claims to arbitration; and Henry B. Endicott, of the Massachusetts State Council on Public Safety, was agreed to both by the railroad company and the committee of employees as the first arbitrator. Each side will select one other arbitrator.

The Lehigh Valley has created the position of fire marshal. Announcement of the appointment of John M. Julian to the position has been made by H. C. Kurtz, chief of the insurance bureau. Mr. Julian has managed the fire-fighting forces of the New York division. His new duties will give him authority over the fire-fighting facilities and conditions affecting fire hazards for the whole system. His office will be in New York.

The New York & Pennsylvania Railroad, 60 miles long, from Canisteo, N. Y., near Hornell, southwestward to Genesee, Pa., and thence westward to Ceres, N. Y., a length of about 57 miles, announces that business will be suspended December 1. The line serves a number of villages which will be wholly deprived of railroad communication. The road has been operating at a loss for the last two years and in recent months has been especially handicapped by lack of men and shortage of coal.

A. H. Plant, Washington, D. C., chairman of the Accounting Officers' Association Committee, announces that the Internal Revenue Department has reconsidered the tax on excess baggage, and holds that the rate of tax to be applied on amounts paid for excess baggage shall be on basis of the tax on persons, namely, eight per cent of the amount paid, instead of on basis of the tax on packages by express. The tax on single trip one way and round trip tickets applies on all rates of thirty-six cents or more.

The Canadian Government has issued an order describing in detail the authority and powers granted to the Fuel Controller, to go into effect November 1. All importers of and dealers in coal must be licensed; commissions and profits are strictly limited and hoarding of coal is forbidden. Prices will be adjusted to stocks on hand, every two weeks; and, except in the summer, no consumer shall have on hand more than enough coal to last him for two months. In case of emergency the fuel controller may

make requisition for coal on any consumer who has more than he needs.

The Philadelphia & Reading, the Central of New Jersey, the Wabash, the Copper Range and other railroads have issued notices to the effect that annual and other season passes which, according to their terms, will expire on December 31, 1917, have been extended to December 31, 1918. Under the regulations of the Interstate Commerce Commission, this extension of time may be made without making endorsement on the passes, a general notice, issued by the road and filed with the commission, being considered sufficient.

The Chicago, Rock Island & Pacific, following an arbitration, has advanced the pay of telegraphers and has made reductions in the workday. The agreement provides for overtime payments for Sunday work, for two weeks' vacation for employees of two years' standing, and other privileges. The advances will add about 12 per cent to the company's payrolls for telegraphers. The Wabash has made an increase of ten per cent in the wages of about 600 telegraphers. Members of the Order of Railroad Telegraphers on the Missouri Pacific have presented a complaint concerning the smallness of the commissions which they receive from Wells-Fargo Express, asking that the present percentages, of six to ten, be increased to a uniform commission of 15 per cent.

The Chamber of Commerce of the United States, reporting on its referendum concerning proposed new railroad legislation, announces an overwhelming vote in favor of laws for Federal regulation of the issuance of railroad securities, and for the other recommendations of the Wheeler committee. For Federal regulation of the issuance of railroad securities the vote was 1,112 in favor and only 27 opposed. For a general railroad incorporation law, under which all railroad carriers subject to the jurisdiction of the Interstate Commerce Commission may organize, the vote was 1,111 to 25. To make such a law compulsory the vote was 1,080 to 49. On the recommendation that the Interstate Commerce Commission be given authority by statute to regulate intrastate rates when those rates affect interstate commerce the vote was 1,054 to 66.

The Illinois State Civil Service Commission announces that it will hold an examination to provide an eligible list for the position of railroad engineer for the Illinois Public Utilities Commission. There is one position of this kind to be filled at the present time at Springfield, salary \$250 to \$333.33 a month. The duties of the position will be to take charge of the investigation of railroad accidents, the examination of dangerous crossings, the inspection for approval of interlocking plants and signal circuits, the investigation of railroad service complaints, and the preparation of orders in connection with railroads. The position is open only to male citizens of the United States over 25 years of age, with an education equivalent to high school graduation, with preferably higher engineering training and experience in location, construction and maintenance of railroads and other engineering work. Applications must be on file in Springfield, Ill., before November 22, and questions covering training and experience will be mailed to all applicants, together with instructions for sending the replies to the commission on November 24.

Southern Pacific in New San Francisco Office Building

The Southern Pacific is now occupying its new \$2,000,000 office building at 65 Market street, San Francisco. The 2,500 employees moved from the Flood building with all equipment, records and paraphernalia without the loss of any time in any department. The new building is of steel, brick and concrete, equipped throughout with automatic sprinklers and pneumatic mailing tubes. Store room is being rented on the first floor and 66 offices on the second. Otherwise, the Southern Pacific's general offices occupy the entire structure.

Better Loading Saves 6,402 Cars in One Month

W. R. Scott, vice-president and general manager of the Southern Pacific, Pacific system, advises that as a result of the car-loading competition in which the agents of the company are participating, 6,402 cars were saved during the month of July, 1917, as compared with the loading in July of last year. Commodities in which the greatest saving of cars is shown follow: Barley, 424 cars; lumber, 509 cars; salt, 40 cars; merchandise, 1,626 cars; rice, 94 cars; brick, 21 cars; canned goods, 96 cars; mill stuffs, 109 cars; perishables, 929 cars; corn and oats, 28 cars; sugar, 88 cars; paper, 78 cars; cement and plaster, 159 cars; miscellaneous, 2,191 cars.

St. Paul Rushes New Electrification

The Chicago, Milwaukee & St. Paul has announced that the contract for locomotives and substation equipment for its Cascade Mountain electrification from Othello, Wash., to Tacoma and Seattle has been divided between the General Electric Company and the Westinghouse Electric & Manufacturing Co. It has been decided to rush this electrification because of the saving in fuel which it will effect. The electric power will be generated by waterfalls in the Cascade mountains, so that thousands of barrels of fuel oil will be saved annually after electric operation starts. The section to be electrified is 211 miles long; this, with the 440 miles already electrically operated over the Bitter Root, Rocky and Belt mountains, between Avery, Idaho, and Harlowton, Mont., will make a total of 651 miles.

Economy of the Lucin Cut-Off

An officer of the Southern Pacific, discussing the savings effected by the line across Great Salt Lake, Utah, built in 1902-1904, reducing the length of the railroad and cutting out steep grades and sharp curves, says that 110 million tons have passed over the cut-off since its completion and that in terms of average car loading this would take about four million cars, making a continuous train 37,000 miles long, or enough to reach one and one-half times around the earth. Had this freight been hauled over the old line it would have necessitated the running of 172 million additional car miles and additional work equivalent to lifting a million car loads a mile in the air. The number of train movements a day is 30 less than it would be if the old trains-load limits were now in force, making an enormous saving in fuel.

Car Distribution Orders

To get empty freight cars into the districts where they are most needed, the Railroads' War Board, acting through the Commission on Car Service, has moved 156,850 empty cars from one railroad to another, irrespective of ownership, since May 1. The orders for these cars since September 1 number 8,905.

The lines to which empties were sent, between October 1 and October 24, were: New York Central, 1,000 cars; Louisville & Nashville, 1,100; Canadian Pacific, 1,000; San Antonio & Aransas Pass, 150; Gulf Coast Lines, 310; Louisiana & Arkansas, 68; Louisiana Railway & Navigation Company, 17; Grand Trunk, 500; Norfolk Southern, 550; Atlantic Coast Line, 1,500; Southern Railway, 260; St. Louis Southwestern, 400; Chicago, Terre Haute & S. E., 200; Mobile & Ohio, 300; Texas & Pacific, 100; Seaboard Air Line, 300; El Paso & S. W., 200; Pittsburgh & Lake Erie, 500; Meridian & Memphis, 150; Tennessee Central, 100; Red River & Gulf, 100; and Sunset Central, 100.

Howard Elliott on Government Ownership

"The putting all the railroads in the country under this so-called War Board is of interest in another way than simply in its aspect of giving a higher efficiency for the use of the people of the United States," said Howard Elliott, of the Railroad's War Board, in a recent interview. "Some say that the putting together of the railroads the way we have this year is an argument in favor of government ownership. I do not agree with that. I think it means that the splendid initiative of the American business man, that has built up this great transportation system that today is doing 20 to 25 per cent more than it ever did before, even under the complicated conditions that confront us—it means that the initiative of the American business man, if not too much fettered by small and nagging restrictions, can do more for the expansion of American business and the expansion

of the country than we could possibly obtain under government ownership.

"I say this because that is one of the great problems that very likely will develop out of this war, and those who depend on a successful transportation system are the men who will have to help decide that great question by such views as Congress gets from its constituents all over the United States."

Railroads Take \$77,810,000 of Liberty Bonds

During the past week additional subscriptions to the Second Liberty Loan have been recorded, bringing the total of \$57,470,000 noted in last week's issue of the *Railway Age Gazette* up to \$77,810,000. The new subscriptions reported are as follows:

Atchison, Topeka & Santa Fe (additional).....	\$2,000,000
Delaware, Lackawanna & Western (additional)....	1,000,000
Kansas City Southern	500,000
Long Island	500,000
Louisville & Nashville.....	6,000,000
Northern Pacific (additional).....	5,000,000
Panama Railroad	30,000
Pennsylvania (additional)	5,000,000
St. Louis-San Francisco.....	300,000
Texas & New Orleans.....	10,000

Besides the subscriptions of the companies, the Railroads' War Board estimates that the railroad employees of this country have taken more than \$50,000,000 worth of the Second Liberty bond issue. For the first bond issue 241,280 railroad employees subscribed an aggregate of \$20,027,966.

Disastrous Fire at Baltimore

In a conflagration, believed to have been of incendiary origin, which started on the evening of October 29, Piers 8 and 9 of the extensive terminal plant of the Baltimore & Ohio Railroad at Locust Point, on the south side of Baltimore Harbor, were destroyed together with freight and other property valued at \$4,000,000 or more.

Piers 8 and 9 were stored with great quantities of munitions and supplies. Fifteen of the crew of a British steamer lying at the pier leaped overboard, and it is feared that some of them were drowned. The British steamer *Kerry Range* was destroyed. The fire started in several places simultaneously, and there were six distinct explosions. A. W. Thompson, vice-president of the Baltimore & Ohio, said:

"The destruction of Piers 8 and 9 will not stop our business at Locust Point. We practically have lost only one-half of Pier No. 8 and the new Pier No. 6, which is completed, will more than offset the loss of Pier No. 9. We have arranged to put up temporary buildings at various places in the terminal to handle the business. The city has kindly offered to help us out with the loan of a pier, as has also the Merchants & Miners Transportation Company. Pier No. 8 will be rebuilt immediately. The material was ordered by telegraph before daylight. There are about 1,500 carloads of freight in transit to Baltimore now for export which we have been handling on those two piers. The Furness-Withy Company has been doing a very large business here also. Reports from our police department indicate beyond question of doubt that the fire was of incendiary origin, as there were five explosions at one time."

Preparedness on the New York Central

Alfred H. Smith, president of the New York Central Lines, has issued a statement showing the immense expenditures of those roads for cars and locomotives during the three years and two months since the war began. The total for locomotives, freight cars and passenger coaches is \$84,324,736; and this equipment at the prices prevailing today would cost \$193,028,610, or an increase of 128.91 per cent!

Thus, by prompt, heavy buying when war broke out, and in early preparation against the present existing dire combination of extraordinary demands for freight service, high prices, and shortage of materials and labor the Central system "has gained an equity of a cool \$100,000,000." Moreover, the gain to the public service in supplying the nation's necessities under war stress, inasmuch as delivery of railroad equipment in America now is impossible at any price, cannot be reckoned in dollars. These humble freight cars and locomotives literally have become almost priceless. About 1,000 locomotives are being sent across the sea to provide for American armies at the front. In freight cars, our government's orders for the month of August alone were 10,866.

Russia is seeking 30,000 to 40,000 freight cars in the United States, in addition to 10,000 in Canada. Railroads and other private buyers must wait indefinitely.

Of freight cars the New York Central bought in the three years 38,052 for the sum of \$53,762,036, or an average of \$1,412.85 per car. The same cars today would cost \$133,839,810, an average of \$3,519.92 per car. The companies bought 734 engines for \$23,768,500, or an average of \$32,383.15 per locomotive. The same locomotives would cost today \$46,927,000, an average of \$63,933.51 each.

Passenger coaches bought numbered 445, costing \$6,794,200, an average of \$15,267.87 per coach. The same cars would now cost \$12,261,600, an average of \$27,544.16. The last of the 38,000 freight cars are just now being delivered. Only about one-half of the 734 locomotives have been delivered, and the remainder will be delayed several months longer through the pre-empting of the manufacturing space for Government necessities.

Railway Revenues and Expenses

The net operating income of the railways of the United States for July, 1917, was less than that for July, 1916, by \$3 per mile, or 0.7 per cent, according to the monthly bulletin of the Bureau of Railway Economics.

Total operating revenues, \$348,437,306, exceeded those for July, 1916, by \$45,205,299. Operating expenses, \$237,821,305, were greater by \$42,216,035. Net operating revenue, \$110,616,001, increased \$2,989,204. Taxes, \$16,286,382 increased by \$3,386,523. Net operating income was \$94,291,180, which is a decrease of \$392,818.

If spread over the mileage represented, operating revenues

increased 19.1 per cent; taxes increased 47.6 per cent. Operating income per mile increased 14.0 per cent.

For the Western railways, operating revenues per mile exceeded those for July, 1916, by 12.5 per cent; operating expenses rose 17.3 per cent; net operating revenue increased 4.7 per cent; taxes increased 24.5 per cent. Operating income per mile increased 1.9 per cent.

The seven months of the current calendar year, compared with the corresponding period of the preceding year, show changes per mile of line as follows: Operating revenues increased 12.0 per cent, operating expenses increased 18.2 per cent, net operating revenue decreased 0.8 per cent, taxes increased 17.7 per cent, while operating income decreased 3.6 per cent.

Operating income per mile decreased 17.6 per cent in the East, increased 3.9 per cent in the South, and increased 9.5 per cent in the West.

July net operating income per mile was 0.7 per cent less in 1917 than in 1916, 23.8 per cent greater than in 1915, 40.2 per cent greater than in 1914, and 36.7 per cent greater than in 1913.

The Interstate Commerce Commission has also given out the table below covering returns for August and for eight months.

Fire Prevention a Patriotic Duty

Resolutions adopted at the annual meeting of the Railway Fire Protection Association at St. Louis, Mo., on October 2, point out that the responsibility of keeping the Allies stocked with supplies and food rests upon the United States, and that while a maximum output of American productive forces is important,

OPERATING REVENUES, EXPENSES AND INCOME OF LARGE ROADS

Item	UNITED STATES		EASTERN DISTRICT*		SOUTHERN DISTRICT		WESTERN DISTRICT†	
	1917	1916	1917	1916	1917	1916	1917	1916
Average number of miles operated..	230,812.53	230,414.18	59,007.58	59,219.92	42,767.29	42,671.87	129,037.66	128,522.39
Railway operating revenues.....	\$365,055,298	\$326,950,719	\$167,325,547	\$148,201,682	\$52,214,155	\$43,914,590	\$145,515,596	\$134,834,447
Railway operating expenses.....	246,128,383	203,307,968	117,068,969	95,103,342	36,066,748	28,850,049	92,992,666	79,354,577
Net revenue from railway operations	118,926,915	123,642,751	50,256,578	53,098,340	16,147,407	15,064,541	52,522,930	55,479,870
Railway operating income.....	101,884,981	109,869,815	44,148,593	47,733,296	13,110,281	13,209,883	44,626,107	48,926,638
Revenues per mile.....	1,581	1,419	2,836	2,503	1,221	1,029	1,128	1,049
Expenses per mile.....	1,066	882	1,984	1,606	843	676	721	617
Net revenue per mile.....	515	537	852	897	378	353	407	432
Income per mile.....	441	477	718	806	307	310	346	381
EIGHT MONTHS ENDED WITH AUGUST								
Item	UNITED STATES		EASTERN DISTRICT*		SOUTHERN DISTRICT		WESTERN DISTRICT†	
	1917	1916	1917	1916	1917	1916	1917	1916
Average number of miles operated..	230,826.83	230,155.82	59,198.27	59,189.92	42,763.97	42,570.74	128,864.59	128,398.16
Railway operating revenues.....	\$2,610,242,488	\$3,325,578,590	\$1,179,770,720	\$1,073,559,264	\$388,817,240	\$336,217,799	\$1,041,654,528	\$915,801,527
Railway operating expenses.....	1,836,880,123	1,544,709,373	875,484,472	726,947,399	266,043,956	222,405,190	695,351,695	595,366,784
Net revenue from railway operations	773,362,366	780,869,217	304,286,248	346,611,865	122,773,284	113,812,609	346,302,833	320,444,743
Railway operating income.....	648,836.375	877,583,608	256,212,320	304,730,764	102,907,294	99,196,852	289,716,761	273,655,992
Revenues per mile.....	11,308	10,104	19,929	18,138	9,092	7,898	8,083	7,133
Expenses per mile.....	7,958	6,711	14,789	12,282	6,221	5,225	5,396	4,637
Net revenue per mile.....	3,350	3,393	5,140	5,856	2,871	2,673	2,687	2,496
Income per mile.....	2,811	2,944	4,328	5,148	2,406	2,330	2,248	2,136

* August returns wanting for one company with July operating revenues of \$159,631.

† August returns wanting for one company with July operating revenues of \$96,039.

averaged \$1,507 per mile, an increase over July, 1916, of 14.6 per cent; operating expenses per mile, \$1,029, were greater by 21.3 per cent; net operating revenue per mile, \$478, shows an increase of 2.5 per cent; while net operating income per mile, \$408, decreased 0.7 per cent. Taxes per mile rose 25.9 per cent.

This summary covers 231,174 miles of operated line, or about 90 per cent of the steam railway mileage of the United States.

For the Eastern railways, operating revenues per mile were greater than those for July, 1916, by 14.0 per cent; operating expenses rose 23.4 per cent; net operating revenue decreased 3.5 per cent; taxes increased 20.2 per cent. Operating income per mile decreased 6.3 per cent.

For the railways of the Southern district, operating revenues per mile exceeded those for July, 1916, by 24.0 per cent; operating expenses rose 26.2 per cent; net operating revenue

the rigid conservation of existing materials and foodstuffs deserves like attention. The resolutions contain the following practical suggestions as to the ways and means of further safeguarding freight and other property:

1. Such additional time, thought and money should be spent in the protection of property as may bring about a more positive conservation of property and resources.

2. An ever-increasing patrolling and watchmen's service should be maintained by active, intelligent and carefully instructed men, such forces to be on duty at all important properties and terminals at all times.

3. Superintendents, foremen and agents should give close personal attention and supervision to the condition of all fire apparatus, water supplies and general housekeeping conditions. Responsibility should be placed for such matters and instructions carefully carried out. Personal tours of the property to look into these matters are desirable on the part of those in charge.

4. All fire equipment should be kept ready for instant use, well maintained in all particulars and plentifully supplied, its condition watched and

to be replaced or supplemented promptly when necessary. Defects should be immediately detected and remedied.

5. Fire brigades and organizations should be carefully instructed and regularly drilled and there should be no relaxation in any way in reducing hazards or the ordinary liability for fires.

Copies of these resolutions have been sent to the chief executive officers of all the railroads in the United States and Canada.

Congressman Adamson Condemns Government Ownership

"What do we want of government ownership of railroads when we have something far better in this country right now?" This was the reply of William C. Adamson, author of the Adamson "eight-hour" law, when questioned in a recent interview at Denver, Col. "Government ownership of railways is not only a fallacy, but is entirely without excuse for having a champion in the United States at this time," the congressman said. He has been on the house committee on interstate and foreign commerce for 21 years, for the past seven having being its chairman, and has had a leading hand in some of the nation's most important legislation during this time.

"When we faced this war there was at once talk of the government taking over the railroads. I thought the government was too busy preparing for the greatest war the world ever dreamed of to stop to wrestle with the herculean task of taking over the most enormous and complicated network of railroads on any continent on the globe. And, besides, it would have cost billions of dollars. This government knows nothing of operating railroads, so I suggested that we make the President of the United States the traffic agent of all the railroads in this country, and the President agreed with me.

"Then we passed a clause in the war bill which provided for preferential shipments—that is, government business was to move first. The result was that millions of tons of military equipment, hundreds of thousands of soldiers and all sorts of supplies have moved on schedule time during the last seven months and without a hitch. No country, even where they have government-owned railroads, ever duplicated this feat. England had an enormous task to move men and munitions, but we saw not the slightest delay or confusion. We told the railroads what to do and they co-operated, not only with splendid spirit but with an efficiency that demanded the admiration of the world. The government got just what it wanted and the railroad chiefs—men whose life work has been railroad—were there to carry out our wishes."

Chicago Switchmen Threaten Another Strike

Representatives of switchmen belonging to the Brotherhood of Railroad Trainmen employed by nineteen railroads entering Chicago recently gave out the following statement: "We hereby earnestly express the belief that the lowest minimum living wage with which a yardman can under existing conditions properly and decently support his family is \$5 per day, and that the present differentials between day and night rates for helpers and foremen should be maintained."

Railroad officers are expecting demands from the brotherhood at any time. The wage scale, which, it is said, the B. R. T. will ask is as follows: Day helpers, \$5 a day; night helpers, \$5.20; day foremen, \$5.30; night foremen, \$5.50. About 2,500 switchmen employed on the nineteen roads belong to the B. R. T., and about 1,300 are non-union. Should the increases be granted by the nineteen roads in question the raise would also probably have to be given to switchmen on all roads in the Chicago switching district, numbering about 7,000. The last time the switchmen presented demands to the Chicago carriers a strike resulted which lasted from July 28 until July 30, when the intervention of officers of the other three railway brotherhoods brought about a settlement.

On Wednesday, October 31, the Switchmen's Union, S. E. Heberlin, president, which represents a large percentage of the yardmen in and around Chicago, formulated a request for large increases in the pay of switchmen, switchtenders and towermen, and asked the railroads for a conference on December 3. They ask for time-and-one-half for all work beyond eight hours a day.

National Waterways Congress

S. A. Thompson, Washington, D. C., secretary of the National Rivers & Harbors Congress, announces that the fourteenth annual convention of the congress is to be held in Washington, December 5, 6 and 7.

The Freight Claim Association

W. P. Paylor, Richmond, Va., secretary of the Freight Claim Association, announces that a conference is to be held at the Vanderbilt Hotel, New York City, November 27, to consider proposed changes in the forms, adopted last year, which have been prescribed for use in making claims on transportation companies for concealed loss and damage. Committees representing the freight claim association, and prominent commercial interests, will confer in the forenoon and take up criticisms of the present forms growing out of the experiences of the last year; and in the afternoon there will be a more general conference, to which shippers' representatives from all over the country have been invited.

MEETINGS AND CONVENTIONS

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

- AIR BRAKE ASSOCIATION.—F. M. Nellis, Room 3014, 165 Broadway, New York City.
- AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontious, 455 Grand Central Station, Chicago.
- AMERICAN ASSOCIATION OF DINING CAR SUPERINTENDENTS.—H. C. Boardman, D. L. & W., Hoboken, N. J.
- AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, Illinois Central, Chicago, Ill.
- AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. & N. W., 143 Liberty St., New York.
- AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Hartman, Room 101, Union Station, St. Louis, Mo.
- AMERICAN ELECTRIC RAILWAY ASSOCIATION.—E. B. Burritt, 8 W. 40th St., New York.
- AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOCIATION.—Fred C. J. Dell, 165 Broadway, New York.
- AMERICAN RAILROAD MASTER TINNERS', COPPERSMITHS' AND PIPEFITTERS' ASSOCIATION.—W. E. Jones, C. & N. W., 3814 Fulton St., Chicago.
- CONVENTION FOR 1917 postponed.
- AMERICAN RAILWAY ASSOCIATION.—J. E. Fairbanks, general secretary, 75 Church St., New York.
- AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichy, C. & N. W., Chicago. Next annual meeting, October, 1918, New York.
- AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next annual meeting, March 20-22, 1918, Chicago, Ill.
- AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, 1112 Karpen Bldg., Chicago.
- AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—Owen D. Kinsey, Illinois Central, Chicago.
- AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.
- AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.
- AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.
- AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Anziet, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January, 1918, Chicago.
- ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—E. R. Woodson, Redwood Bldg., Washington, D. C. Next annual meeting, St. Louis, May, 1918.
- ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Semi-annual meeting with Master Car Builders' Association.
- ASSOCIATION OF RAILWAY CLAIM AGENTS.—Willis H. Failing, Terminal Station, Central of New Jersey, Jersey City, N. J.
- ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreuccetti, C. & N. W., Room 411, C. & N. W., Chicago.
- ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—W. L. Connelly, Superintendent of Telegraph, Indiana Harbor Belt, Gibson, Ind.
- ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 75 Church St., New York.
- BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—Tom Lehn, The Lehn Company, Chicago. Meetings with American Railway Bridge and Building Association.
- CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.
- CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.
- CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aron Kline, 841 Laylor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.
- CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 3d Friday in January, May, September and November. Annual dinner, 2d Thursday in March. Hotel Statler, Buffalo, N. Y.
- CRUISE INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—W. R. McMunn, New York Central, Albany, N. Y.
- CINCINNATI RAILWAY CLUB.—H. Boubit, Chief Interchange Inspector, Cincinnati, 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November. Hotel Sinton, Cincinnati.
- ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Fluer K. Miles, 568 Union Arcade Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.
- FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Traffic Manager, R. F. & P., Richmond, Va.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, C. H. & D., Lima, Ohio.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—J. G. Crawford, C. R. & O. R. R. 702 E. 51st St., Chicago. Next convention, May, 1918, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1126 W. Broadway, Winona, Minn.

INVESTMENT BANKERS' ASSOCIATION OF AMERICA.—Frederick R. Fenton, 11 W. Monroe St., Chicago. Next annual convention, November 12-14, Hotel Belvedere, Baltimore, Md.

MAINTENANCE OF WAY AND MASTER ENGINEERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 15-17, 1918, Chicago.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—A. P. Dane, B. & M., Reading, Mass.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, 1122 Karpen Bldg., Chicago. Next annual convention, June, 1918, Atlantic City, N. J.

NATIONAL ASSOCIATION OF RAILWAY COMMISSIONERS.—Jas. B. Walker, 120 Broadway, New York City.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, 149 Peoples Gas Bldg., Chicago. Annual exhibition, March 18-21, 1918, Coliseum and Annex, Chicago.

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

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Geo. A. J. Hochgrebe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PACIFIC RAILWAY CLUB.—W. S. Wollner, Assistant to Chief Engineer, Northwestern Pacific R. R., San Francisco, Cal.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 30 Church St., New York.

RAILWAY CLUB OF PITTSBURGH.—J. R. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial-Annex Hotel, Pittsburgh.

RAILWAY DEVELOPMENT ASSOCIATION.—D. C. Welty, Commissioner of Agriculture, St. L. Iron Mt. So., 1047 Railway Exchange Bldg., St. Louis. Next annual convention, May, 1918, Houston, Tex.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—J. Scribner, 1063 Monadnock Block, Chicago. Meetings with Association of Railway Electricians, Chicago.

RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, Office of the President's Assistant, Seaboard Air Line, Norfolk, Va.

RAILWAY REAL ESTATE ASSOCIATION.—R. H. Morrison, Assistant Engineer, C. & O., Richmond, Va.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, N. Y. C. R. R., Box C, Collinwood, Ohio.

RAILWAY SUPPLIES AND MATERIALS ASSOCIATION.—J. D. Conway, 2136 Oliver Bldg., Pittsburgh, Pa. Meetings with Master Car Builders' and Master Mechanics' Association.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 50 Church St., New York. Meetings with Association of Railway Telegraph Superintendents.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Club has been suspended until after the war.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September 17-19, 1918, Auditorium Hotel, Chicago.

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

SALT LAKE TRANSPORTATION CLUB.—R. E. Rowland, David Keith Bldg., Salt Lake City, Utah. Regular meetings, 1st Saturday of each month, Salt Lake City.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association. SOCIETY OF RAILWAY FINANCIAL OFFICERS.—L. W. Cox, N. & W., Philadelphia, Pa.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. R. R., Atlanta, Ga.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant Bldg., Atlanta, Ga. Regular meetings, 3d Tuesday in month, except May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.

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

TRAFFIC CLUB OF CHICAGO.—C. R. Signer, La Salle Hotel, Chicago.

TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7122 Stewart Ave., Chicago. Next annual convention, June 18, 1918, Grand Rapids, Mich.

TRAFFIC CLUB OF PITTSBURGH.—D. I. Wells, Gen'l Ag't, Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings bi-monthly, Pittsburgh.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio.

UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

WESTERN ASSOCIATION OF SHORT LINE RAILROADS.—Clarence M. Oddie, Mills Bldg., San Francisco, Cal.

WESTERN CANADIAN RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1122 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

WESTERN SOCIETY OF ENGINEERS.—Edgar S. Nethercut, Secretary, 1735 Monadnock Bldg., Chicago, Ill. Regular meeting, first Monday in month, except January, July and August. Extra meetings generally on other Monday evenings except in July and August.

Traffic News

Morgan's Steamship Line has again been obliged to place an embargo on northbound freight shipments from Galveston.

The National Industrial Traffic League will hold its annual meeting at the Waldorf Astoria hotel, New York, on November 15 and 16.

The Minnesota Railroad and Warehouse Commission held a hearing at St. Paul, Minn., on October 31, on the application of the railroads for changes in the carload minimum weights in intrastate tariffs to make them conform to the interstate minimums.

The experimental use of large motor trucks in the parcel post service, designed to facilitate the transportation of food supplies direct from farmers to city consumers, which was provided for in the last post office appropriation bill, will first be put in operation between Washington, D. C., and Richmond, Va.

At the meeting of the Traffic Club of New York on October 30, T. C. Powell, vice-president of the Southern Railway, delivered an address on "Scientific Marketing." The report of a special committee appointed to investigate pier congestion and delays to vehicles receiving and delivering freight was also discussed.

The Pennsylvania, like most other roads, has posted notices announcing that the internal revenue tax is to be collected on tickets and freight bills after November 1; and passengers are called upon to apply at the ticket offices earlier than has been customary, because of the extra work which the ticket agents will have to do in collecting the tax and validating the tickets.

The location of the National Army cantonnements on the Pacific Coast is the subject of a pamphlet, with a small map, which has been issued by E. G. McMicken, general passenger agent of the Pacific Steamship Company, San Francisco. Six pages of the pamphlet are occupied with pictures of the chevrons worn by various grades of officers and men in the army and in the navy.

R. H. Ashton, chairman of the central department committee of the Railroads' War Board, has sent to the railroads a circular calling attention to the very large prospective increase both in the number and weight of Christmas packages, and recalling the fact that to take care of this traffic is going to require every available baggage and express car, as well as some refrigerator and other special cars. He urges that all of this class of cars be made suitable for service and gotten off of repair tracks by the first part of December; and, further, that every means be used to induce the public to ship Christmas packages a week or ten days earlier than usual.

The Department of Agriculture issues warning that more care should be exercised in loading grapes, to prevent serious losses in transit. Twelve-quart baskets should never be loaded in cars more than eight high. When loaded nine high the bottom baskets are crushed and broken. All packages must be very firmly stowed in cars to prevent shifting of the load and consequent crushing of bottom layers. Large losses have been found to result from loading weak and broken packages at or near the bottom of the car. Where there has been a scarcity of suitable packages, losses have resulted from chucking, resulting from mixing packages. Trays, twelve-quart baskets, full bushel and half-bushel baskets have been loaded in the same car.

New Boston & St. Louis Trains

The New York, New Haven & Hartford and the Pennsylvania announce that, beginning November 25, a new through passenger train will be run, by the Hell Gate Bridge Route, between Boston and St. Louis. By the tentative schedule the westbound train leaves Boston daily at 1:25 p. m.; Harrisburg, Pa., 11:40 p. m.; Pittsburgh, 6 a. m.; Columbus, 10:15 a. m.; Indianapolis, 3:25 p. m.; arriving at St. Louis 9:35 p. m. Eastbound, the train will leave St. Louis at 11:50 p. m.; Indianapolis, 7:45 a. m.; Columbus, 12:40 p. m.; Pittsburgh (eastern time), 7:10; Harrisburg, 1:15 a. m.; arriving in Boston at 11:30 a. m. Presumably the trains will stop at New York, N. Y., though that place is not mentioned in the list of way stations.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

A hearing on some details connected with the protest of the Winston-Salem Southbound Railway to the tentative valuation of its property made by the Division of Valuation of the Interstate Commerce Commission was held before Examiner Staples at Washington on October 25.

Chairman Hall has addressed a letter to George Stuart Patterson, counsel for the eastern railroads, saying that the fifteenth section order of October 20 is not to be understood as precluding application for or the adoption of a speedier procedure in respect of the increased rates on commodities sought by the eastern carriers and set for hearing on November 5 in the fifteen per cent case.

The fifteenth section amendment of August 10, as applied to carriers ordered to remove a discrimination, apparently deprives them of the option which they have possessed hitherto, as to whether they will remove the discrimination by reducing the higher or raising the lower rate. This point came out in connection with tariffs filed by the Carolina, Clinchfield & Ohio, the Southern, the Norfolk & Western, and the Chesapeake & Ohio and their connections in the Bristol-Johnson City case. In compliance with the Commission's order in the complaint of the Johnson City (Tenn.) Chamber of Commerce v. Southern et al., the roads filed tariffs putting the Johnson City rates in effect at Bristol. The commission held that the Johnson City rates had not been shown to be unreasonable, but that they were unduly discriminatory against Johnson City and in favor of Bristol. Under the new law the carriers made what they thought would be a pro forma application for leave to file tariffs extending the Johnson City rates to Bristol. The commission has never ruled, formally that the new law applies to tariffs filed in obedience to the unamended law, but informally it has declined to place tariffs filed under such conditions in an exempted class, not subject to the so-called Smith amendment. At a so-called informal hearing on the tariffs on October 26, Frank Lyon, attorney for Bristol shippers demanded a formal hearing on the tariffs which have been filed. The commission undoubtedly will agree to this suggestion and have a formal proceeding; but the holding of the hearing will deprive the carriers of the increased revenue that would have resulted if the higher rates for Bristol had been allowed to take the course that has been the usual one in the past.

Rates on Rails to Seaboard

West Virginia Rail Company v. Chesapeake & Ohio et al. Opinion by Commissioner Daniels:

Rates on light steel rails in carloads from Huntington, W. Va., to New York, Philadelphia, Baltimore and eastern basing points, for domestic consumption, found unreasonable to the extent specified in the report. Reparation awarded. Rates on same for export, not found to have been unreasonable, or unduly prejudicial in respect of transportation initiated by the Chesapeake & Ohio, but held to have been unduly prejudicial on traffic originated by the Baltimore & Ohio. Export and domestic rates to the ports, for the future, permitted to be established on the basis voluntarily proposed by defendants. (46 I. C. C., 677.)

Hearings on Transcontinental Rates

Applications filed by the transcontinental roads under the amended 15th section of the act to regulate commerce involve a request for the approval by the commission of tariffs proposed to be filed by the transcontinental lines in purported compliance with the order of the commission dated June 30, 1917. Upon protest filed by Pacific Coast interests and others the commission has arranged to set these applications for informal hearing to be held before Attorney-Examiner Thurtell at Room 1809, 165 Broadway, New York City, on November 5; at the Federal building, Chicago, on November 12, and at the United States court rooms, Portland, Ore., on November 21, in order that the com-

mission may determine (1) whether or not the rates proposed are in compliance with the order of the commission aforesaid, and (2) to receive evidence upon the reasonableness and propriety of the increased rates proposed. The tariffs which the carriers ask permission to file are voluminous. They may be inspected at the office of the commission at Washington, but in order to apprise interested parties as to their character, Attorney-Examiner Thurtell will read, at the hearing on November 5, an abstract designed to elucidate their structure.

STATE COMMISSIONS

The Public Service Commission of Alabama, to which application has been made to order the restoration of numerous passenger trains taken off several months ago, has deferred consideration of the question until its next monthly meeting. This action was taken in the expectation that the railroads and the public can come to an agreement.

The Railroad Commission of Louisiana has issued an order amending its rule No. 49 so as to require all railroads to provide equal but separate accommodations for white and colored passengers and to provide in both the white and the colored cars (or compartments) separate toilets for the sexes. The order must be complied with on or before May 1, 1918. There was some demand for separate smoking compartments both for the whites and the blacks making four classes of accommodations on every train—but the order says nothing about smoking compartments.

COURT NEWS

Train Sheet Records as Evidence

In an action for damages for the destruction of growing timber by fire the Virginia Supreme Court of Appeals holds that records of entries made in the established course of business on train sheets by train despatchers, from reports telegraphed or telephoned them by station agents as to the time of arrival and departure of trains, are admissible in evidence to indicate the location of a train at a certain time.—*French v. Virginian* (Va.), 93 S. E., 585. Decided September 20, 1917.

Scope of State Headlight Law

The Alabama Supreme Court holds that the Alabama Locomotive Headlight Law of 1915 has no application to engines engaged in interstate commerce, the federal act of 1911 as amended in March, 1915, having excluded the states from the right to legislate, though the final federal rules on the subject of headlights were not promulgated until after a railroad charged with violating the Alabama law committed the offense.—*L. & N. v. State* (Ala.), 76 So., 505. Decided June 30, 1917.

Abolition of Grade Crossings—Necessity of Taking Property

A city and several railroads, acting under a state statute giving the necessary authority, entered into a contract for the appropriation of land for yards to relocate the railroads, to elevate their tracks and to provide sites for municipal piers and other extensive improvements. In a suit for injunction by taxpayers, the Pennsylvania Supreme Court holds that a court will not interfere with the judgment of the contracting parties as to the necessity and extent of taking property, without strong and conclusive evidence that the taking was arbitrary, and not for legitimate railroad purposes.—*Chew v. City of Philadelphia* (Pa.), 101 Atl., 915. Decided April 30, 1917.

Recovery for Undercharge—Establishment of Rates

A railroad suing to recover an undercharge on an interstate shipment of live stock is entitled to recover on showing the shipment, its legal duty to recover for the undercharge, and that its tariffs have been filed and published as provided by law. The Supreme Court of the State of Washington holds that, while establishment of a tariff rate depends on the tariffs being filed and posted . . . in "two conspicuous places," etc., such posting is not a condition precedent to a recovery for an undercharge if the establishment of the rate is shown by the filing and by providing its freight offices with copies.—*Northern Pacific v. Longmire* (Wash.), 167 Pac., 79. Decided August 24, 1917.

Crossing Accident—Contributory Negligence

In an action for personal injury to the plaintiff's foot, which was run over by a locomotive at a crossing, the Pennsylvania Supreme Court holds that, as it appeared the plaintiff stopped, looked and listened when he was on a track next to the one on which the locomotive approached, and did not see it, though its headlight was burning and he had an unobstructed view for 160 feet, and immediately started across the track and was struck, he was contributorily negligent, and judgment for the plaintiff was reversed and rendered for the defendant.—*Lapino v. Philadelphia & Reading (Pa.)*, 101 Atl., 767. Decided April 9, 1917.

Car Door Accident—Assumption of Risk by Passenger

In an action by a passenger for injuries to his fingers caused by being slammed in the jamb of a car door it appeared that the plaintiff was on a day coach approaching Scranton when the station was called and the car door into the vestibule was opened by the trainman. The plaintiff left his seat and went forward into the vestibule, preparatory to alighting. There he took a position facing the unopened vestibule door, through which he expected to go. To steady himself he placed his right hand against the jamb of the car door, with his fingers in the space between the door and the jamb. Before the station was reached the trainman reached from the vestibule into the car and pulled shut the door on the plaintiff's fingers. There was no evidence as to the reason for thus shutting the door. There was no proof that the trainman actually saw the position of the plaintiff's fingers, but it was contended he ought to have seen and given warning. The Pennsylvania Supreme Court held that the trainman was under no obligation to see where the plaintiff's fingers happened to be, nor to foresee any reasonable probability that they would be in such a position. The plaintiff, by leaving his seat and standing in the vestibule before the train stopped assumed the risk of what happened, even if he were not guilty of contributory negligence.—*L'Hommedieu v. D., L. & W. (Pa.)*, 101 Atl., 933. Decided May 7, 1917.

Crossing Accident—Stop, Look and Listen

The Circuit Court of Appeals, Fourth Circuit, has affirmed the judgment of the federal district court, N. D. West Virginia, in favor of the defendant railroad in the crossing accident case of *Dernberger v. Baltimore & Ohio* (234 Fed. 405). An abstract of the district court's opinion, containing full details of the facts of the case, appeared in our issue of November 24, 1916, Vol. 61, p. 962. Stated briefly the action was for the death of a farmer, well acquainted with the crossing, who drove his team upon the track in front of a fast express train. The Circuit Court of Appeals in its opinion reviews the evidence at great length and cites many cases regarding the care required from persons approaching railroad crossings. It holds that where, notwithstanding obstructions to the view of approaching trains caused by a heavy growth of weeds, underbrush, etc., a driver on a highway could have seen or heard an approaching train in ample time to avoid being struck if he had looked and listened, but, from a point 150 feet from the crossing he drove towards and on it without looking and listening, apparently oblivious to the danger, he did not exercise the care that a reasonable man would take for his own safety, and there could be no recovery for his death. Under such circumstances the failure of the railroad to give the signal required by statute on approaching the crossing did not make it liable. The court said: "The danger incident to a crossing is increased or diminished according to the nature of the land on either side of the highway. . . . Where the banks are level and the intervening space between the road and the railroad consists of cleared land, the risk is less; but where as in this instance, it appears that there is a heavy growth of weeds, underbrush, etc., so as to obscure the view of the track beyond the crossing in the direction from whence the train comes, the risk is correspondingly increased. Such condition is a warning to the traveler of the imminence of danger, and in the nature of an admonition to exercise reasonable caution in approaching a railroad track; also, the means of transportation employed by the traveler becomes an important factor in determining the degree of diligence to be exercised. . . . No hard and fast rule as to the duty of a traveler on the highway to stop, look and listen before crossing a railroad can be laid down. Under some circumstances the railroad company may so act as to allay the sense

of danger and relieve the traveler from the obligation to stop, look and listen. A plain view of the track may make it no breach of duty for him not to stop or listen. He may be traveling on foot or so silently that he can listen as well going as stopping. The obstruction of the view may be such that he is obliged to depend upon his hearing without the aid of his sight. We, therefore, do not lay down the inflexible rule that a traveler must stop, look and listen under all circumstances." All that the court decided, therefore, was that the evidence excluded any other reasonable conclusion than that the negligent conduct of the deceased was the proximate cause of his death.—*Dernberger v. B. & O.*, 243 Fed. 21. Decided May 17, 1917.

One-day Time Limit on Ticket Valid

The holder of a ticket with the time limit, "Good for continuous passage beginning date of sale only" printed on its face was ejected when he attempted to ride with it on the day following its date. In an action for damages for wrongful ejection the question was raised whether the time limit so imposed was lawful. The plaintiff contended that his rights were contractual, fixed by the contract of carriage between carrier and passenger, and that, therefore, the time limit, although printed on the face of the ticket, could not form a part of such contract or bind the plaintiff, unless he had actual notice of it and acquiesced therein at the time the contract of carriage was made; and this he denied. The railroad contended that the time limit was not a matter of contract, but merely a regulation for the conduct of its business, the validity of which was to be determined upon the sole inquiry of its reasonableness as such regulation, and not on any inquiry as to its invalidity as a contract between carrier and passenger. The Virginia Supreme Court of Appeals holds that a provision in a ticket, considered in its primary sense as evidence of the passenger's right to transportation, that it should be good only on the day of sale, is a reasonable regulation of the carrier and valid, in the absence of governmental regulation or statute to the contrary.—*L. & N. v. Rieley (Va.)*, 93 S. E. 574. Decided September 20, 1917.

Fires Set by Locomotives—No Liability for Injury to Firemen or Fire Engines

The New Hampshire Supreme Court holds that the statute of that state making a railroad liable for damages to person or property from fires set by its locomotives has no application to the case of a fireman employed by a municipality to extinguish fires who was injured in attempting to extinguish a fire set by a railroad's locomotive. The statute applies to persons and property exposed to damage along the line of the road. It does not apply to firemen or fire engines whose exposure results from an attempt to extinguish the fire. Nor was the railroad liable at common law. The question was not one of proximate or remote cause, but whether the railroad owed any duty at all to the plaintiff—whether, apart from his contract of employment, it stood in any legal relation to him, however remote. The court held that it did not. Neither the plaintiff nor his property was in a position to be injured by a fire set by the railroad. His connection with the fire arose solely from his own act in coming into contact with it after it was set. Nor was the railroad liable because of his employment. Knowing that fires will occur from various causes, some culpable and some not, the plaintiff undertook the work of extinguishing all fires without reference to how they were caused. The danger of injury in doing such work was necessarily assumed by him.—*Clark v. Boston & Maine (N. H.)*, 101 Atl. 795. Decided June 5, 1917.

Hours of Service Act—"Emergency" Different from "Casualty"

At a station where the only employee was both agent and telegrapher, the pipe leading up from a pump through the bottom of a water tank used for engines sprang a leak, so that it could not be drained. The weather was extremely cold, and the agent, recognizing that if water were allowed to stand motionless in the pipe it would freeze, communicated the fact to his superiors and was directed to remain on duty during the night, keeping up steam and running the pump at frequent intervals. It did not appear that it would have been impossible to have relieved the operator within the 17-hour period prescribed by section 2 of the law. The Circuit Court of Appeals, Sixth Circuit, affirming a

judgment of the district court for the Northern District of Ohio, holds that, as a casualty or unavoidable accident, to take the case out of the provision in section 3 of the act must be more than some occurrence of a more or less trifling nature, which might possibly be foreseen, it was a violation of the act to retain the operator on duty for more than 17 hours; it not appearing that the opening of the leak was unavoidable.

To make clear the reasoning of the court it is necessary to refer briefly to the sections of the act applicable to the case. Section 2 forbids the employment of day-time telegraph operators or train dispatchers longer than 13 hours, except in case of emergency, when they may be permitted to remain on duty for 4 additional hours in a 24-hour period not exceeding 3 days in any week. Section 3 provides that the act shall not apply in any case of casualty or unavoidable accident, or the act of God. The court said: "If the 'emergency' which will permit 17 hours' service under section 2, and the 'casualty or unavoidable accident' required to invoke the proviso of section 3, were the same thing there would be reason to say that the latter proviso did not cover the cases reached by the former; but there is not only a presumption of a difference in meaning from the fact that the words are selected and put into contrast, but they inherently imply distinction. Congress would naturally have foreseen that in the course of railroad service there would be a great number of unexpected conditions which would require the service of a telegrapher for a few extra hours, and which well might be termed emergencies, but which would not at all rise to the scope of an act of God, an unavoidable accident, or a casualty. While 'casualty' and 'unavoidable accident' are terms broad enough to cover many rather trifling things, yet their association in this section indicates that they were not used in any such broad sense, but only with reference to those extreme cases which justify coupling them with 'act of God.' This construction has been approved by those Circuit Courts which have passed on the question. *United States v. Mo. Pac.*, 213 Fed. 169; *San Pedro v. United States*, 230 Fed. 737; *Denver Ry. v. United States*, 233 Fed. 62;—*Baltimore & Ohio v. United States*, 243 Fed. 153. Decided May 8, 1917.

CHILE INVITES TENDERS FOR LOCOMOTIVE BOILERS.—The American ambassador at Santiago, Chile, cables that tenders have been requested by the Chilean Government for fifteen locomotive boilers which are urgently required for the state railroads. With their bids American manufacturers are required by the Chilean Government to present the requisite export licenses.—*Commerce Report*.

SIBERIAN RAILROAD ONE-THIRD EFFICIENT.—Inefficient transportation service by the Trans-Siberian Railroad is responsible for an immense congestion of traffic at Vladivostok, was the statement of S. R. Bertron, a member of the American Commission to Russia, at the second conference of the Russian-American Chamber of Commerce held recently in New York. "The Trans-Siberian Railroad is only giving about thirty per cent efficiency," Mr. Bertron said. "On the books of the line are double the number of locomotives the Pennsylvania Railroad has per mile. There are three times as many men employed on the Trans-Siberian Railroad as the Pennsylvania has, and yet the efficiency is only thirty per cent. Their failure to utilize to the fullest extent the facilities at their disposal has created a congestion at the port of Vladivostok, where 700,000 tons of material have accumulated. The road is moving only such stuff as is now entering the port, and no inroads are being made on the accumulated freight. The only remedy for this condition is by the introduction of more cars and locomotives. It is expected that our government will be able to introduce a total of 75 locomotives and 1,000 cars in Russia during the present year, but this is only a small fraction of what Russia requires in the way of railroad equipment. In addition to the Trans-Siberian line there will be available during the winter months only one additional line, the Kola Railroad, from the port of Murman. Plans are being made, with the assistance of the American Railway Commission in Russia, to place this line in working order, that its facilities may be of use during the winter months. If this line is placed in commission at the time of the closing of Archangel it will mean that about two thousand tons of material a day can reach Russia by way of the Atlantic Ocean." [Press despatches October 16 said that the Stevens Commission had improved the situation at Vladivostok, increasing the efficiency of the railroad 25 per cent.]

Equipment and Supplies

FREIGHT CARS

THE UNITED STATES NAVY DEPARTMENT is asking for prices on 4 40-ton single sheet box cars.

C. U. SNYDER & Co., Commercial Car Line, Chicago, Ill., has ordered 50 8,000-gal. capacity tank cars from the Pennsylvania Tank Car Company.

THE PETROLEUM REFINING COMPANY, Houston, Texas, reported in the *Railway Age Gazette* of October 12 as inquiring for 50 8,000-gal. capacity tank cars, has ordered these cars from the Pennsylvania Tank Car Company.

THE WESTERN PACIFIC, reported in last week's issue as having withdrawn its inquiries for freight cars, is inquiring for 1,500 steel underframe, 40-foot, 40-ton box cars, and for 300 steel frame, 36-foot and 50-ton general service cars.

THE ILLINOIS CENTRAL, reported in last week's issue as inquiring for prices on cars, has ordered 500 gondola cars from the Haskell & Barker Car Company and a like number from The Pullman Company. This company is asking for prices on 300 flat cars.

SIGNALING

THE LONG ISLAND has ordered from the General Railway Signal Company a mechanical interlocking machine, 32 levers, for Far Rockaway, N. Y.

THE MISSOURI, KANSAS & TEXAS is to install an interlocking plant at North Jefferson, Mo.; Saxby & Farmer machine, 12 levers; installation by the railroad company's forces.

THE ATCHISON, TOPEKA & SANTA FE has ordered from the General Railway Signal Company the materials for an electric interlocking plant at Kelker, Col.; 28-lever machine model 2, with 21 working levers and 7 spare spaces.

THE GREAT NORTHERN has ordered from the General Railway Signal Company, Rochester, N. Y., 200 type 2A automatic block signals with the necessary batteries, relays, wires and other apparatus. These signals are to be installed by the railroad company's forces.

THE GENERAL RAILWAY SIGNAL COMPANY, Rochester, N. Y., has shipped to the South Eastern & Chatham Railway, of England, an electric interlocking machine of 200 levers. It is a "model 2" machine, unit lever type. This machine is for installation at Victoria station, London.

THE GRAND TRUNK is to install the "A P B" automatic block signal system on its line between Shelburne, N. H., and Bethel, Me., 15 miles, single track. The material has been ordered from the General Railway Signal Company and the railroad's forces will do the construction work.

THE NEW YORK CENTRAL is to enlarge its electric interlocking at Wesleyville, Pa., by adding 32 levers to the present 48-lever machine. At Dunkirk the same company will add 16 electric levers to the 60-lever mechanical interlocking lately installed there. Material for these two installations has been ordered from the General Railway Signal Company.

THE NORTHERN PACIFIC's plans for new automatic block signaling aggregate 228 miles of road, as follows: Rice, Minn., to Little Falls, 17 miles, double track; Easton, Wash., to Lester, Wash., 19 miles, double track; Toston, Mont., to Garrison, Mont., 92 miles, single track; Missoula, Mont., to De Smet, Mont., 7 miles, double track; De Smet to Paradise, 93 miles, single track. A total of 379 semaphores will be required; 1,100 relays, 188 switch circuit controllers and 400 cast iron battery chutes; all of which articles, with other material, have been ordered from the General Railway Signal Company. This company also has contracted to install the signals, which work, it is expected, will be completed by the Fall of 1918.

Supply Trade News

The Falls Hollow Staybolt Company has removed its Chicago office from the Fisher Building to 654 Railway Exchange Building.

A. L. Whipple, who for two years has been sales manager of the Railway Improvement Company, 61 Broadway, New York City, has been made vice-president and assistant general manager of that company.

The Continental Construction Corporation has been chartered in Delaware with a capital of \$100,000 to manufacture railway supplies. The incorporators are: C. L. Rimlinger, M. M. Clancy, Wilmington, Del.; Clement M. Egner, Elkton, Md.

The United States Steel Corporation has declared the usual extra dividend of 3 per cent in cash and the regular quarterly dividend of $\frac{1}{4}$ per cent on the common stock, also the regular quarterly dividend of $\frac{1}{4}$ per cent on the preferred stock.

Charles E. Lee, formerly general superintendent of the Boston & Maine and more recently in the railroad supply business, has been appointed transportation manager of the Atherton Construction Company, headquarters at the Four River Ship Building Plant, Quincy, Mass.

Morrill Dunn, vice-president of McCord & Co., and Fred A. Preston, manager of sales of the P. & M. Company, Chicago, have been commissioned captains in the Signal Corps of the U. S. Army and have been assigned to duty with the Air Craft Production Board in France.

R. J. Morgan, who resigned his position with the Midvale Steel & Ordnance Company, has been appointed supervisor of sales of the American Steel Export Company, New York. Mr. Morgan prior to his connections with the Midvale Steel & Ordnance Company was thirteen years in the employ of the Carnegie Steel Company.

The Keith Railway Equipment Company, 122 South Michigan avenue, Chicago, recently bought 33 acres near Hammond, Ind., and has begun the construction of a shop, 200 ft. by 85 ft., for the construction and repair of tank cars. Later two other buildings will be added, one of which will be 350 ft. by 300 ft. and the other 200 ft. by 70 ft.

On October 1, 1917, the New York sales offices of the Edison Storage Battery Company, long located at 206 West Seventy-sixth street, moved into larger quarters, at 209 West Seventy-sixth street, right across the street from the old headquarters. At the new location many additional facilities have been installed to enable the manager, John Kelly, to take care of the increased business.

The Pacific Car & Foundry Company, Seattle, Wash., was recently incorporated to build standard railway equipment, logging cars, trucks, contractors' equipment, forgings, castings, iron and steel and railway supplies in general. The new company has taken over the business of the Seattle Car & Foundry Company and now operates fully equipped car plants both at Seattle, Wash., and Portland, Ore. The officers are: William Pigott, president; O. D. Colvin, vice-president and general manager; James F. Twohy, vice-president and treasurer; James E. McNery, secretary; T. G. Hlaywood, director of purchases.

J. J. Byrne has been appointed eastern representative of the Locomotive Stoker Company of Pittsburgh, Pa., with office at 50 Church street, New York City. Mr. Byrne entered railroad service in 1903, on the Cleveland, Cincinnati, Chicago & St. Louis as machinist's apprentice. He served four years in this capacity at the Delaware shops. He entered the service of the Lake Shore & Michigan Southern as machinist in 1907, and remained with that company until 1909, at which time he entered the employ of the Locomotive Stoker Company as mechanical expert. Mr. Byrne will still devote much of his time to the Southern roads.

Clement F. Street has opened an office as consulting mechanical engineer at 50 Church street, New York. He will give

special attention to questions of design and tests of railway equipment and specialties. Mr. Street at the age of 18 became a machinist's apprentice at the works of the Buckeye Engine Company, and after three years entered the drawing room of that company. Later he became chief draftsman of the Johnstown Company, Johnstown, Pa., leaving after two years to become chief draftsman in the motive power department of the Chicago & St. Paul Railway, where he remained for four years. In 1892 he became mechanical editor of the Railway and Engineering Review of Chicago. Seven years later he went with the Dayton Malleable Iron Company and for nine years was engaged in designing and selling railway supplies for this company, for the Wellman-Seaver-Morgan Company, Cleveland, Ohio, and for the Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa. In 1907 he started to develop a locomotive stoker with the financial assistance of the Westinghouse Air Brake Company, this work finally developing into the formation of the present Locomotive Stoker Company, of which Mr. Street was a vice-president. In 1916 the John Scott Legacy Medal and Premium was awarded to Mr. Street on the recommendation of the Franklin Institute of Philadelphia for his work in developing the Street stoker.

Extension of Automatic Stop System on C. & E. I.

The Miller Train Control Corporation, Staunton, Va., and Danville, Ill., is extending the installation of its automatic train stop apparatus on the lines of the Chicago & Eastern Illinois. The new work is on the 62-mile single-track cutoff between Woodland Junction, Ill., and Villa Grove, over which is moved a heavy through traffic between Chicago and St. Louis. This installation when completed will make a total of 169 miles of line and 276 miles of track on this road operated under the Miller system. On the mileage where the system is at present in service there is a full equipment of automatic (visual) block signals, but the new installation is on an unsigned line.

Supply Companies to Discontinue Sending Holiday Cards

Recognizing that the sending of holiday greeting cards constitutes a burden on the country's mail service and serves no productive purpose during the war, a number of railway supply companies in Chicago have announced their intention to omit the distribution of such cards this year and instead to contribute money to war relief organizations. The announcement reads as follows:

"At this time of world war when money is so sorely needed to alleviate suffering, reduce hunger and care for the sick and wounded, it seems sheer waste to spend money for such unnecessary and unproductive things as holiday greeting cards.

"A number of companies and individuals, among them the undersigned, whose custom it has been to distribute such cards, have decided not to do so this year, but instead to contribute the money to war relief organizations, where it will perform some real service.

"As lack of time prevents a personal canvass of other steel producers and consumers, as well as business houses and banks in general, this form of letter is substituted, and it is hoped the suggestions offered may meet with wide approval and be productive of generous results.

"Contributions should be sent direct (together with a copy of this circular, if desired) to The American Red Cross, the American Fund for French Wounded, or any other relief organizations that may appeal to the giver."

This is signed by Illinois Steel Company; Morden Frog & Crossing Company; American Steel & Wire Company; Universal Portland Cement Company; Lackawanna Steel Company; Carnegie Steel Company; Inland Steel Company; Chicago Railway Equipment Company; A. M. Castle & Company; The P. & M. Company; A. J. O'Leary & Son Company.

TRADE PUBLICATIONS

STAYBOLT IRON.—The Rome Iron Mills, Inc., 30 Church street, New York, has issued Bulletin No. 1 on Rome hollow staybolt iron. These staybolts are made with the tell-tale holes in them and the advantages obtained by using this material are explained. Illustrations showing the texture of the material from the nick and bend test and places in the firebox where these staybolts are particularly advantageous are shown.

Railway Construction

GULF COAST LINES.—These lines have awarded a contract for the construction of a one-story depot, 34 ft. by 230 ft., at Beaumont, Tex., to cost about \$20,000. The building will be of brick construction on reinforced concrete footings and will have a composition roof. The contract was let to Herman Weber, Beaumont. The construction of tracks and other incidental improvements will cost \$30,000 additional. C. S. Kirkpatrick, chief engineer, Houston, Tex.

ILLINOIS CENTRAL.—This company has awarded a contract to G. A. Johnson & Son, Chicago, for the following improvements at Memphis, Tenn.: the construction of new racks and bins in the storehouse, remodeling the mill building, erection of platforms and incline at the mill building, plumbing and sewage work, construction of transfer table pit and engine hoist pit, and erection of coach yard building. The estimated cost of the work is \$50,000.

A contract for additional work at Clinton, Ill., has been awarded to T. S. Leake & Co., Chicago. Eleven stalls in the roundhouse will be lengthened at a cost of about \$60,000.

MONONGAHELA & SOUTHERN.—This company is building a 5-mile branch, to be known as the Clairton branch, from the main line of the Monongahela Southern at Bull Run, Pa., about two miles west of Duquesne to the new By-Product Coke Plant at Wilson. The contract for the grading has been awarded to the T. A. Gillespie Company, New York and Pittsburgh, and work has been commenced. The contract for the steel superstructures has been awarded to the American Bridge Company and track laying will be handled by the railroad forces. The grading work is heavy, calling for the excavation of about 1,200,000 cu. yd. unclassified. There will be a tunnel 1,700 ft. long, two steel railroad bridges 115 ft. and 430 ft. long respectively and four concrete arches, the largest being 50 ft. diameter inside and 425 ft. long. The amount of concrete will be about 75,000 cu. yd. including tunnel lining. The limiting grade southbound is about 1.6 per cent, northbound 1.25 per cent compensated. The maximum curvature is 7 deg. The new line will carry coke from the new By-Product Coke Plant at Clairton to the plants of the Carnegie Steel Company in the Pittsburgh district, also coal, finished steel products and by products from the coke plant. The company expects to complete the work within twelve months.

MONTANA SOUTHERN.—This company has awarded a contract to W. R. Allen, Butte, Mont., for the construction of a steam railway line from Divide, Mont., on the Oregon Short Line, up the Big Hole river through Dewey and Wise River to the Elkhorn mines in Beaver Head county, about 40 miles. The work involves a maximum grade of 2½ per cent, light bridge work and the construction of one tunnel 210 ft. long. The principal commodities the road will handle will be ore and timber. The line is now about 60 per cent completed.

TEXAS & PACIFIC.—This company is building a combination office building and warehouse, 36 ft. by 255 ft., the office portion of which will be two stories high and the warehouse one story. The structure will have a brick exterior and will cost about \$30,000. The Watson Company, Dallas, Tex., has the contract.

MONEY CHANGERS RUSHED.—The busiest money changing office in the world is at Victoria Station, London, where soldiers on leave receive English money for French. Nearly every day it is more than \$80,000. Since the opening of the office two and a half years ago more than \$15,000,000 has been changed.

INCREASED COAL PRODUCTION IN FRANCE.—The monthly production of coal in France has increased from 1,576,062 tons in June, 1916, to 2,345,251 tons in June, 1917, the output of the French coal mines having increased almost steadily during the intervening period. The increase in the output has continued since June, 1917, at which time the total French production, added to the imports of British coal, reached a total of over 3,560,000 tons. French production and British imports in August, 1917, amounted to 4,346,000 tons, the French mines having produced 2,666,000 tons, as compared with 1,616,000 tons in August, 1916.

Railway Financial News

ATCHISON, TOPEKA & SANTA FE.—See editorial comments elsewhere in this issue.

CHESAPEAKE & OHIO.—At the annual meeting of this company the date for holding annual meetings was changed from October to the first Tuesday in April.

CINCINNATI, HAMILTON & DAYTON.—The Delphos branch of this line extending from Dayton, Ohio, to Delphos, has been sold to John Ringling, circus owner, for the price of \$275,000. The sale was confirmed by Judge Hollister in the U. S. District Court at Cincinnati. With the entry of this decree the second receivership of the Cincinnati, Hamilton & Dayton will be at an end. The total bonded indebtedness of the railway company was approximately \$33,200,000. The amount received from the sales of the main line and the Delphos and Ironton divisions was between \$5,000,000 and \$6,000,000.

EVANSVILLE & INDIANAPOLIS.—See article on Court Takes Control of Rate-Making elsewhere in this issue.

WASHINGTON, BALTIMORE & ANNAPOLIS.—This company has declared an initial dividend of 3 per cent on the \$3,000,000 common stock, payable October 31 to stock of record October 25.

RAILWAY PROGRESS IN SOUTH AFRICA.—According to the report for 1916 of the general manager of railways and harbors in South Africa there were 9,419 miles of South African railways open to traffic on December 31 last as compared with 9,033 miles at the end of 1915. The total mileage of railways operated by the administration at the end of 1916 was 11,355. Of the 386 miles opened during the year about 110 miles were in the Cape Province, 158 miles in the Transvaal, 77 miles in the Orange Free State, and 39 miles in Natal.

GRADE OF DOMINICAN CENTRAL REDUCED.—A new cut-off 3 miles long, between Barrabas and La Sabana, was recently completed by the Dominican Central, which is owned and operated by the Dominican Government. The new line reduces the grade from 9½ to 3 per cent and the maximum curvature to 32 degrees. This corresponds to the remainder of the road between Bajabonico and Moca, the terminus. The same tonnage that is hauled over the new line may be carried through to the end of the railroad. It is not feasible to reduce this maximum grade of 3 per cent or the degree of curvature, as the cost would be prohibitive. The new line is laid with 60-lb. American rails, all stone ballasted. Bridges and culverts are of reinforced concrete. The change will greatly reduce the cost of operation and maintenance. The train tonnage will be increased five-fold.—*Commerce Report.*

TRAVELING IN MODERN RUSSIA.—A most entertaining picture of present-day railway travel in Russia was recently contributed to the Daily Mail (London), by Alexander M. Thompson, a well-known writer on labor matters. Mr. Thompson desired to travel from Petrograd to Moscow, and was "evidently congratulated" by his Russian friends when he succeeded, through a friendly commissioner, in booking a sleeping berth at less than four times the official price. The explanation is that in Russia it is the practice of speculators to buy up railway tickets and sell them at huge profits, and unless the intending passenger is prepared to stand in a queue at a ticket office for a couple of days, he is compelled to patronize one of these speculators. Mr. Thompson's train, the last of the day, was due to start at 10 o'clock on a Tuesday. When he arrived at the station, in very good time, he was informed that the train had started three hours earlier. Two very helpful suggestions were then made, that he might stand all night in the corridor or guard's van of another train or return to his hotel and wait until the next day, when he might perhaps have better luck. "When I told my Russian friends who had congratulated me on my extraordinary good fortune in securing the ticket," continued Mr. Thompson, "they merely shrugged their shoulders comfortably and murmured the magic word Nitchewo (never mind), and assured me 'That's Russia.' Meanwhile I wonder when I shall reach Moscow. Nitchewo."

ANNUAL REPORT

ATCHISON, TOPEKA & SANTA FE RAILWAY—TWENTY-SECOND ANNUAL REPORT

SEPTEMBER 11, 1917.

To the Stockholders:

Your Directors submit the following report for the fiscal Year July 1, 1916, to June 30, 1917, inclusive.

The Lines comprising the Atchison System, the operations of which are embraced in the following statements, and the mileage in operation at the end of the year as compared with the previous year, are as follows:

	June 30, 1917.	June 30, 1916.
Atchison, Topeka & Santa Fe Railway.....	8,639.53 miles.	8,647.87 miles.
Rio Grande, El Paso & Santa Fe Railroad.....	20.22 "	20.22 "
Golden Colorado & Santa Fe Railway.....	1,937.21 "	1,937.59 "
Panhandle & Santa Fe Railway.....	665.02 "	665.02 "
	11,261.98 "	11,270.70 "

The average mileage operated during the fiscal year ending June 30, 1917, was 11,270.17 miles, being an increase of 23.37 miles as compared with the average mileage operated during the preceding fiscal year.

In addition to lines covered by this report there were completed on June 30, 1917, 50.70 miles of additional line, all of which will be ready for operation in the near future.

The Company also controls, through ownership of stocks and bonds, other lines aggregating 161.33 miles, and is interested jointly with other companies in 601.87 miles.

INCOME STATEMENT.

The following is a summary of the transactions of the System for the years ending June 30, 1916 and 1917:

	1916.	1917.
Operating Revenues.....	\$133,762,392.24	\$156,179,120.54
Operating Expenses.....	83,730,960.35	96,333,568.67
Net Operating Revenue.....	\$50,031,431.89	\$59,845,551.87
Taxes.....	6,210,366.13	9,870,634.29
Uncollectible Railway Revenues.....	41,072.53	23,242.60
Operating Income.....	\$43,779,993.23	\$49,951,674.98
Rentals and Other Charges.....	\$3,597,122.79	\$3,398,048.92
Gross Corporate Income.....	\$47,087,122.79	\$53,399,966.24
Interest on Bonds, including accrued interest on Adjustment Bonds.....	\$45,109,468.00	\$51,321,917.32
Net Corporate Income (representing amount available for dividends and surplus and for necessary but unproductive or only partially productive expenditures).....	\$2,127,654.79	\$2,078,048.92
	\$45,109,468.00	\$51,321,917.32
Interest on Bonds, including accrued interest on Adjustment Bonds.....	12,529,733.40	12,112,843.95
Net Corporate Income (representing amount available for dividends and surplus and for necessary but unproductive or only partially productive expenditures).....	\$32,579,734.60	\$39,209,073.37

From the net corporate-income for the year the following sums have been deducted:

DIVIDENDS ON PREFERRED STOCK—	
No. 37 (2½%) paid Feb. 1, 1917.....	\$3,104,342.50
No. 38 (2½%) paid Aug. 1, 1917.....	3,104,342.50
	\$6,208,685.00

DIVIDENDS ON COMMON STOCK—	
No. 45 (1½%) paid Sept. 1, 1916.....	\$3,223,177.50
No. 46 (1½%) paid Dec. 1, 1916.....	3,245,947.50
No. 47 (1½%) paid Mar. 1, 1917.....	3,281,737.50
No. 48 (1½%) paid June 1, 1917.....	3,290,767.50
	\$13,041,630.00

Appropriation for Fuel Reserve Fund.....	\$6,210.37
California-Arizona Lines Bonds Sinking Fund.....	14,266.58
S. F. & S. J. V. Rv. Bonds Sinking Fund.....	12,710.00
Income Appropriation for Investment in Physical Property.....	11,000,000.00
(a) For Equipment.....	8,875,211.42
(b) For other additions and betterments.....	39,209,073.37

Surplus to credit of Profit and Loss June 30, 1916.....	\$26,686,308.01
Additions to Profit and Loss Account (Sundry Adjustments).....	466,805.89
Surplus appropriated for Investment in Physical Property.....	\$27,153,113.90
Surplus to credit of Profit and Loss June 30, 1917.....	\$26,988,543.65

Income from sources other than earnings from operation consisted of interest on cash in banks and sums collected as interest and dividends upon bonds and stocks of other companies, the operations of which are not included in the System accounts.

During the fiscal year the sum of \$400,000 in cash was received as the net proceeds of sale of land embraced in the Santa Fe Pacific Land Grant, which was not actually written off the book value of Railroads, Franchises and Other Property and the transaction does not appear in the Income Account.

The appropriation of \$11,000,000 for investment in equipment is somewhat less than the anticipated cost of equipment which has already been bonded but the delay of which has been delayed by the extraordinary conditions growing out of the war. These extraordinary conditions also result in this equipment costing nearly twice what would be its normal cost.

CAPITAL EXPENDITURES AND REDUCTION OF BOOK VALUES.

The total charges to Capital Account, as shown by the General Balance Sheet, page 47, at June 30, 1917, aggregated \$742,631,861.89 as compared with \$715,477,622.71 at June 30, 1916, an increase during the year of \$27,154,239.18, which analyzes as follows:

Construction and acquisition of new mileage, including the acquisition of bonds and stocks of other railway and terminal companies:	
Barion County & Santa Fe Ry.....	\$183,913.67
California, Arizona & Santa Fe Ry.....	3,202.15
Eastern Ry. of New Mexico.....	369.86
Grand Canyon Ry.....	4,621.78
Minkler Southern Ry.....	651,324.48

North Texas & Santa Fe Ry.....	765,634.62
Oil Fields & Santa Fe Ry.....	23,071.34
Oklahoma Central R. Ry.....	26,387.44
Osage County & Santa Fe Ry.....	43,683.83
South Plains & Santa Fe Ry.....	923,088.88
Verde Valley Ry.....	258,000.00
	\$2,882,904.05

Additions and Betterments—System Lines:

Fixed Property.....	\$8,350,070.21
Equipment.....	225,554.84
Betterments to Equipment.....	215,825.53
	\$8,340,490.90

Fuel Lands and Other Properties:

Fuel Lands.....	\$113,246.85
Real Estate held for future use.....	263,850.83
Tie and Timber Lands.....	25,089.23
Miscellaneous Items.....	209,205.38
	192,981.53

Other Investments..... 16,288,852.06

Total Charges..... \$27,705,078.54

Reduction of Book Values:

Baumont Wharf & Terminal Co.....	\$36,000.00
Sunset Ry.....	19,000.00
Santa Fe Land Sales.....	400,000.00
Western Oklahoma Ry.—Land Sales.....	1,624.00
Ice Plant, Belen.....	11,319.61
Ice Plant, San Bernardino.....	63,503.85
Santa Barbara Tie & Pole Co.....	19,391.90
	\$50,839.36

Net Increase in Capital Account during the year..... \$27,154,239.18*

Credits in italics.

*Of this amount the sum of \$14,773,600 represents temporary investments in short term notes and other quickly convertible securities, which sum is to be deducted to make satisfactory comparison with preceding years. The "Net Increase in Capital Account during the year" after deducting the sum of these temporary investments was \$12,380,639.18. The credit item of \$225,554.84 for "Equipment" analyzes as follows:

Equipment retired during the year:	
26 Locomotives.....	\$395,926.81
1,256 Freight-Train Cars.....	652,678.20
36 Passenger-Train Cars.....	188,996.62
257 Miscellaneous Work Cars.....	59,214.77
Miscellaneous Adjustments.....	25,026.37
	\$1,321,842.47

Less—Equipment added as follows:	
11 Locomotives.....	\$287,622.66
427 Freight-Train Cars.....	436,834.50
3 Passenger-Train Cars.....	6,220.29
Motor Equipment of Cars.....	1,272.32
1 Car Float.....	47,725.57
583 Miscellaneous Work Cars.....	315,938.29
1 Automobile.....	690.00
	\$1,096,287.63

\$225,554.84

The 1,256 freight-train cars reported as retired and the 583 miscellaneous work cars added, include 549 cars, which, being permanently assigned to work service, were relettered in work service equipment series with preceding year and transferred from freight equipment to work service equipment at their depreciated value at time of relettering.

In addition to the equipment reported retired as above, 7 freight-train cars and 3 miscellaneous work cars leased from the Oklahoma Central Railroad Company, were also retired during the year and liability therefor included in Other Unadjusted Credits in the General Balance Sheet, page 31.

MAINTENANCE OF EQUIPMENT.

The following statement shows the sums charged to Operating Expenses for Maintenance of Equipment during each year since July 1, 1896:

Year ending June 30.	Average Operated Mileage.	Total Expenditure.	Expenditure Per Mile.
1897.....	6,443.81	\$3,443,884.82	\$534.45
1898.....	6,236.02	3,859,277.99	618.72
1899.....	7,032.62	4,810,795.64	684.07
1900.....	7,341.34	5,267,832.40	717.56
1901.....	7,807.31	6,257,456.57	801.49
1902.....	8,855.38	7,864,251.25	891.22
1903.....	9,765.13	8,510,543.09	1,068.48
1904.....	8,179.59	10,006,135.41	1,223.31
1905.....	8,305.40	10,914,864.47	1,314.19
1906.....	8,433.99	10,730,040.43	1,271.05
1907.....	9,273.15	11,779,846.64	1,270.32
1908.....	9,415.01	14,246,621.41	1,513.18
1909.....	9,794.86	13,903,897.37	1,419.51
1910.....	9,959.33	15,667,974.44	1,569.13
1911.....	10,350.13	16,686,145.45	1,612.17
1912.....	10,627.92	16,321,231.41	1,554.51
1913.....	10,750.31	19,415,254.63	1,806.02
1914.....	10,908.52	19,624,821.51	1,799.05
1915.....	11,114.52	19,764,535.40	1,778.26
1916.....	11,246.80	20,514,960.18	1,824.07
1917.....	11,270.17	25,273,168.92	2,242.48

The heavy increase of 1917 over 1916 is due largely to increases in wages and in cost of materials.

For the year ending June 30, 1917, maintenance charges, including renewals and depreciation, averaged as follows:

Per locomotive.....	\$6,542.04
Per locomotive mile.....	.2035
Per freight car.....	145.28
Per freight car mile.....	.0104
Per passenger car, including mail and express.....	1,621.48
Per passenger car mile.....	.0167

The foregoing average maintenance charges include a proportion of unlocated expenditures for Maintenance of Equipment charged to Superintendence, Shop Machinery, Injuries to Persons, Insurance, Stationery and Printing, Other Expenses, and Maintenance of Equipment at Terminals. Refrigerator cars are not taken into consideration in arriving at freight car averages, such cars being operated by The Santa Fe Refrigerator Dispatch Company, which bears the expense of their maintenance.

MAINTENANCE OF WAY AND STRUCTURES.

The following statement shows the sums charged to Operating Expenses for Maintenance of Way and Structures during each year since July 1, 1896:

Year ending June 30.	Average Operated Mileage.	Total Expenditure.	Expenditure Per Mile.
1897.....	6,443.81	\$6,282,923.15	\$975.03
1898.....	6,936.02	8,281,397.88	1,193.97
1899.....	7,032.62	7,671,107.62	1,090.93
1900.....	7,341.34	6,354,372.10	865.56
1901.....	7,807.31	6,433,840.36	824.08
1902.....	7,855.38	6,141,466.39	781.82
1903.....	7,965.13	9,304,892.04	1,168.20
1904.....	8,179.59	9,170,234.07	1,121.11
1905.....	8,305.40	11,385,418.33	1,370.85
1906.....	8,433.99	12,475,407.97	1,479.18
1907.....	9,273.15	15,286,062.66	1,648.42
1908.....	9,415.01	14,120,828.02	1,499.82
1909.....	9,794.86	12,884,406.81	1,315.43
1910.....	9,916.33	17,807,136.20	1,795.74
1911.....	10,350.13	16,059,786.90	1,551.65
1912.....	10,457.92	16,076,833.75	1,512.70
1913.....	10,750.31	18,054,413.03	1,679.43
1914.....	10,908.52	15,308,780.25	1,403.38
1915.....	11,114.52	16,514,467.89	1,485.85
1916.....	11,246.80	19,518,635.03	1,735.48
1917.....	11,270.17	19,119,336.16	1,696.45

In 1916 Maintenance of Way and Structures included over \$1,500,000 on account of the storm at Galveston and of the floods in California and Arizona. If this abnormal expenditure were excluded from 1916, the year 1917 would show an increase over 1916 of more than \$1,100,000, due principally to increases in wages and in cost of materials.

COMPARISON OF OPERATING RESULTS.

The following is a statement of revenues and expenses of the System for the fiscal year ending June 30, 1917, in comparison with the previous year:

Operating Revenues:	Year Ending June 30, 1917.	Year Ending June 30, 1916.	Increase or Decrease.
Freight.....	\$111,809,085.10	\$91,432,428.97	\$20,376,656.13
Passenger.....	32,770,088.51	31,568,600.55	1,201,487.96
M. Express, and Miscellaneous.....	11,599,946.93	10,761,362.72	838,584.21
Total Operating Revenues.....	\$156,179,120.54	\$133,762,392.24	\$22,416,728.30

OPERATING EXPENSES:

Maintenance of Way and Structures.....	\$19,119,336.16	\$19,518,635.03	—\$399,298.87
Maintenance of Equipment.....	25,274,168.92	20,514,960.18	4,759,208.74
Traffic.....	780,823.48	7,557,235.84	25,067.64
Transportation—Rail Line.....	45,910,504.94	38,281,953.78	7,628,551.16
Miscellaneous Operations.....	184,248.47	—	184,248.47
General.....	3,494,122.42	2,904,040.13	590,082.29
Transportation for Investment—Cr.....	478,635.72	243,464.61	185,171.11
Total Operating Expenses.....	\$96,333,568.67	\$83,730,960.35	\$12,602,608.32

Net Operating Revenue.....	\$59,845,551.87	\$50,031,431.89	\$9,814,119.98
Ratio of Operating Expenses to Operating Revenues.....	61.68	62.60	—92

Credits in italics.

The average tons of freight (revenue and company) per loaded car mile increased from 19.96 to 20.56, or 3.01 per cent.

The average tons of freight (revenue and company) carried per freight-train mile (freight and mixed) increased from 468.10 to 497.75, or 6.33 per cent.

The average freight revenue per freight-train mile increased from \$3.74 to \$4.05, or 8.29 per cent.

The average passenger revenue per passenger-train mile increased from \$1.18 to \$1.23, or 4.24 per cent.

The average passenger-train revenue per passenger-train mile increased from \$1.49 to \$1.56, or 4.70 per cent.

The tons of freight carried one mile (revenue and company, but excluding water ton miles) increased 2,285,850,242, or 19.95 per cent, while miles run by freight cars (loaded and empty) in freight and mixed trains increased 132,403,672, or 16.86 per cent, and the mileage of such trains increased 3,134,586, or 12.81 per cent.

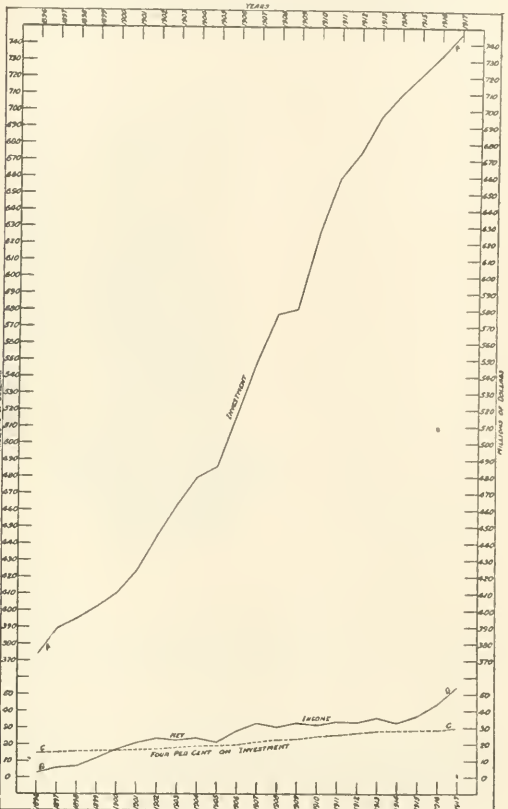
The number of passengers carried one mile decreased 144,934,949, or 9.15 per cent, while miles run by passenger-train cars (excluding work) in passenger and mixed trains decreased 2,513,288, or 1.52 per cent, and the mileage of such trains decreased 77,901, or .29 per cent.

The following is a consolidated statement of the business of the System for each fiscal year during the period since January 1, 1896:

Fiscal Year Ending June 30.	Average Operated Miles.	Gross Revenues, Including Income from Other Sources.	Expenses, Including Taxes and Other Charges.	Interest on Bonds.	Net Corporate Income.
1897.....	6,443.81	\$4,532,628.99	\$36,038,455.30	\$8,440,387.91	\$53,785.78
1898.....	6,936.02	39,396,126.41	30,513,553.17	7,045,988.30	1,836,584.94
1899.....	7,032.62	46,762,933.47	29,332,564.11	7,241,972.00	4,187,997.36
1900.....	7,341.34	46,498,809.04	29,414,427.35	7,345,166.50	9,739,304.98
1901.....	7,807.31	54,807,479.78	34,509,783.34	8,202,810.93	12,497,829.08
1902.....	7,855.38	60,275,944.33	36,272,432.45	8,438,985.00	15,564,526.88
1903.....	7,965.13	63,668,390.99	40,635,576.48	9,134,485.24	13,898,329.27
1904.....	8,179.59	69,419,975.41	44,641,134.10	9,418,770.00	15,559,771.31
1905.....	8,305.40	89,182,329.65	61,458,019.12	9,611,510.00	17,742,606.06
1906.....	8,433.99	99,300,749.05	51,035,355.71	10,622,184.22	17,733,209.12
1907.....	9,273.15	74,436,574.65	61,779,916.16	11,847,934.20	21,168,723.82
1908.....	9,415.01	91,289,770.61	65,031,582.67	12,579,301.77	13,678,886.17
1909.....	9,794.86	85,424,091.89	61,458,019.12	12,548,081.93	20,417,990.93
1910.....	9,916.33	107,543,250.16	75,133,314.54	11,984,151.36	20,425,784.26
1911.....	10,350.13	109,772,481.69	75,689,094.83	12,712,319.31	21,371,067.55
1912.....	10,457.92	110,323,328.13	77,001,224.38	13,660,859.50	21,660,241.25
1913.....	10,750.31	119,412,939.94	83,432,816.21	12,631,335.40	24,153,734.33
1914.....	10,908.52	113,284,122.98	80,213,746.92	12,886,412.23	20,193,964.69
1915.....	11,114.52	120,662,737.93	83,746,128.92	12,785,747.10	24,130,861.91
1916.....	11,246.80	137,069,521.80	91,960,053.80	12,529,733.40	32,579,734.60
1917.....	11,270.17	159,627,411.80	108,205,444.48	12,112,843.95	39,209,073.37

* 18 months.

The following chart brings out still more clearly the significance of the statement and strikingly depicts the progressive increase in investment which has been necessary to enable the Company to render its public service.



Line "A" is Investment in Property including Material and Supplies.
Line "B" is the Net Income Applicable to Bond Interest, Dividends, Improvement of Property and Strengthening of Credit.
Line "C" is the Amount of Income which would be equivalent to Four Per Cent. on the Investment shown.

PROPERTY INVESTMENT AND RATE OF RETURN.

The following statement shows, for each year, the amount of investment, the amount of net income applicable to bond interest, dividends, improvement of property and strengthening of credit, and the rate of return which such net income represents on the amount of the investment.

Year Ending June 30.	Property Investment.*	Income Applicable to Bond Interest, Dividends, Improvement of Property and Strengthening of Credit.	Per Cent. of Return.
1896 (6 months).....	\$23,260,004.67	\$2,432,870.06	1.65
1897.....	389,118,442.87	6,070,364.45	1.56
1898.....	394,170,563.40	8,871,947.26	2.25
1899.....	402,388,222.21	11,409,315.30	2.84
1900.....	409,670,087.91	17,068,850.91	4.17
1901.....	423,734,716.52	21,196,714.38	5.00
1902.....	445,314,062.19	23,021,018.14	5.37
1903.....	463,230,180.22	23,032,814.51	4.97
1904.....	479,324,339.26	24,778,541.31	5.17
1905.....	485,497,374.42	21,353,856.15	4.40
1906.....	515,557,913.70	28,355,393.34	5.50
1907.....	550,693,087.37	32,724,274.07	5.94
1908.....	572,433,073.23	25,633,510.34	4.44
1909.....	580,297,115.78	33,523,437.28	5.78
1910.....	625,401,211.54	32,387,712.39	5.18
1911.....	688,156,763.91	34,102,511.86	5.18
1912.....	673,465,876.49	33,321,100.75	4.95
1913.....	695,730,983.22	36,078,744.55	5.19
1914.....	709,304,446.55	38,355,393.34	5.40
1915.....	720,792,460.35	36,928,030.11	5.12
1916.....	732,403,747.21	45,312,106.50	6.19
1917.....	746,839,604.72	51,788,723.21	6.93
Annual Average.....	\$347,808,376.51	\$27,132,940.18	4.95

* The amount shown above as "Property Investment" includes sums invested in material and supplies. The amount for year 1917 excludes temporary investments in short term notes and other quickly convertible securities referred to in note on page 11.
* The "Income" shown above is determined after allowing for adjustments made through profit and loss.

The development of the Company's business and of its efficiency have been due principally to the very large expenditures (over \$331,000,000) which have been made in the extension and improvement of the property since January 1, 1896. In order to make such expenditures, your Company has raised since 1896 over \$225,000,000 of "new money" by the sale of capital stock and of bonds which are now outstanding or which (in the case of many of the Convertible Bonds sold) are represented by common stock now outstanding.

CAPITAL STOCK AND FUNDED DEBT.

The outstanding Capital Stock (deducting stock in treasury) on June 30, 1916, consisted of:

Common	\$214,312,500.00	
Preferred	124,173,700.00	
		\$338,486,200.00

Issued during the year:

Common Stock issued in exchange for Convertible Bonds retired	5,336,000.00	
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Capital Stock outstanding June 30, 1917:

Common	\$219,648,500.00	
Preferred	124,173,700.00	
		\$343,822,200.00

The number of holders of the Company's capital stock on June 30, 1917, and the changes in number for the year were as follows:

	Number of Stockholders.	Increase or decrease for the Year.
Preferred	17,098	Decrease 28
Common	26,750	Increase 257

The outstanding Funded Debt of the System (deducting bonds in the treasury) amounted on June 30, 1916, to...

	\$301,552,353.50
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The following changes in the Funded Debt occurred during the year:

Obligations Issued:		
California-Arizona Lines First and Refunding Mortgage 4% Bonds		\$52,545.60
Obligations Purchased or Retired:		
S. F. & S. J. V. Ry. Co. First Mortgage 5% Bonds	\$11,000.00	
Convertible 4% Bonds	5,336,000.00	
Convertible 5% Bonds:		
Retired	6,883,000.00	
Matured Unpaid transferred to Current Liability	566,000.00	
		12,796,000.00
Decrease of Funded Debt	\$12,743,454.40	
Total System Funded Debt outstanding June 30, 1917.....	\$288,808,899.10	

Interest charges for year ending June 30, 1918, will be approximately \$11,742,000 or an average monthly charge of about \$978,500. In making this approximation, exchanges of Convertible Bonds for Common Stock made since June 30, 1917, aggregating \$481,000 are considered.

TREASURY.

Neither this Company nor any of its auxiliaries has any notes or bills outstanding. The Company held in its treasury on June 30, 1917, \$39,047,787.80 cash, and also had available \$5,281,000 General Mortgage Bonds, including bonds not yet certified by the Trustee. The Company also had in the treasury unpledged a large amount of stocks and bonds of other companies, of which part are carried on the balance sheet. Investments and part are included under Railroads, Franchises and Other Property. In addition, the Company and its affiliated companies have invested \$14,773,600 in short term notes and other quickly convertible securities.

FUEL RESERVE FUND.

The fund has been increased during the year by appropriations of income, as follows:

Amount to credit of Fund June 30, 1916.....	\$1,888,316.42
Added during the year.....	56,210.37
In Fund June 30, 1917.....	\$1,944,526.79

BARTON COUNTY AND SANTA FE RAILWAY.

A company has been organized to construct this line, extending northwest from Holton, Ellsworth County, Kansas, a distance of about 32 miles. Construction is in progress and it is expected the line will be completed by the close of the present calendar year. The new line will serve a good agricultural section and should be a valuable feeder to the System.

MINKLER SOUTHERN RAILWAY.

The completion of the extension of this line, from Lindsay to Porterville, California, referred to in the last annual report, has been somewhat delayed. However, 10.8 miles had been completed at June 30, 1917, and the remainder of the extension to Porterville will be ready for operation in the near future. A further extension of this line from Porterville to Ducor, a distance of approximately 13 miles is under construction and will, it is expected, be completed and ready for operation not later than January 1 next. Arrangements have been made by a long term agreement with the Southern Pacific Company for the joint use of that company's line from Ducor to Oil Junction, a distance of 39.5 miles, from which latter point a connection, 3.5 miles in length, will be built to the company's main line near Bakersfield, of the company's main line to the eastward, and to the traffic originating in the Minkler Southern territory.

NORTH TEXAS AND SANTA FE RAILWAY.

This line is being constructed from the main line at or near Shattuck, Ellis County, Oklahoma, westward into Hansford County, Texas, a distance of about 82 miles. Track laying is under way and, if labor conditions permit, the line should be completed and in operation before the end of the current year. The district served by this line is good agricultural land, already fairly well settled and under cultivation, and badly needs transportation facilities.

OIL CITY BRANCH.

Negotiations with the Southern Pacific Company looking to the purchase of an undivided one-half interest in this line, extending from Oil Junction to Alnoff, Kern County, California, a distance of 6.35 miles, with a branch of 2.47 miles in length, extending from said line at Treadwell Junction to the station of Porterville, Kern County, have been completed during the year, and transfer of such half interest to your Company only awaits the formal

approval of the Railroad Commission of the State of California. After such approval is given, this line will be operated for the joint account of the two companies and will give your company direct access over its own rails to the Kern River oil field. The proposed connection between Oil Junction and Bakersfield, referred to under the heading of the Santa Fe Kern Railway, will also give the Company a direct connection with the Oil City Branch.

OSAGE COUNTY AND SANTA FE RAILWAY.

This company has been organized to construct a line from Owen, Washington County, Oklahoma, to a connection with the Eastern Oklahoma Division of your main line near Fairfax, a distance of about 62 miles. The line will traverse an important section of the mid-continent oil fields, and moreover will form an important cut-off for business between Kansas City and Oklahoma-Texas points. Right of way has been arranged for and construction is about to commence, but the line will not be ready for operation until the latter part of next year.

SOUTH PLAINS AND SANTA FE RAILWAY.

This line, formerly known as Crosbyton-South Plains Railroad (name changed during the year) extends from Lubbock, Texas, to Crosbyton, Texas, a distance of 38 miles, with an extension under construction running southwest from Lubbock for a distance of about 65 miles, of which 39.9 miles were completed at June 30, 1917. It is expected the remainder of the line will be completed and ready for operation by January 1 next.

MATERIAL AND SUPPLIES.

The balance sheet shows an increase of \$2,055,222.83, in the value of material and supplies on hand at June 30, 1917, as compared with the balance at the close of the previous year. This increase is due to a somewhat larger stock of material and supplies, rather than the use in its valuation of the high prices now prevailing, the material and supplies having been inventoried at normal prices.

TAXES.

Federal, state and local tax accruals for the year ending June 30, 1917, aggregate the large total of \$9,870,634.29, and show an increase over the preceding year of \$3,660,268.16. The first of these Federal taxes have become a matter of serious concern. Indeed, the Company's tax situation is revolutionized by the new system of Federal taxation recently adopted and which applies to all of the calendar year 1917. The change wrought is not adequately indicated by the increase in taxes for the fiscal year ending June 30, 1917, because that year contains only six months of the calendar year 1917 to which the new Federal taxes apply.

It is impossible to forecast with accuracy the taxes for the calendar year 1917, but it is by no means improbable that they will be, say \$12,000,000, or about twice the annual average of taxes for recent years, and possibly more.

The natural effect of the war with its heavy expenditures is to stimulate expenditure on the part of the states and local governing bodies much of which it is greatly feared will prove to be misdirected and unproductive. In some quarters it is already apparent that there is grave danger that the conduct of state and local affairs will become decidedly more wasteful and inefficient at the very time the need is greatest for making the best possible use of our resources of labor and materials.

Your officials are actively co-operating in efforts that are being made to promote economy and efficiency.

GENERAL.

Your Directors fully recognize that the time is inopportune for the construction of new lines, but the foregoing had been in all cases planned, in some cases definitely promised and in other cases placed under construction before either the great advance in prices or the conditions of the war and it seemed advisable to proceed in spite of adverse conditions. Completion will naturally be somewhat retarded, but it is hoped that all will be completed before the close of the calendar year 1918.

Contrary to our expectations all of the abnormal reasons cited a year ago as accounting for the Company's large increase in cost of operation have been accentuated in the last twelve months. Not only is the European war still in active progress, but our own country is now participating in it and is spending enormous sums for supplies and for transportation. The Pacific Coast is still under the grip of the Panama Canal. The metal market has been unprecedentedly active in all its branches, and this has largely increased our traffic, especially in copper, zinc and lead and the raw materials entering into their production. The oil tonnage on our lines still increases. Even our passenger traffic, which we believed had reached its maximum with the two great expositions on the Pacific Coast, has again shown an increase of over a million dollars.

Owing to high prices and lack of labor, it has not been possible to add materially to equipment, and the result has been that in the effort to handle this enormous business every nerve has been strained to the utmost, and, even with all that could be done, the results have not always been what our patrons have been taught to expect. Very much against the will of your Directors and officers it has been absolutely necessary to place orders for nearly four thousand cars of various types and for thirty engines, all of which were to have been delivered during the calendar year and some of them during the fiscal year, but the needs and demands of the Government have when prices advanced so rapidly, made it impossible to make any more. The price we have contracted to pay for this equipment, when received, are almost double those of two years ago.

On all sides the Company has been confronted with the necessity for increasing wages. The cost of the payroll for the last six months of the year was nearly 33 per cent in excess of the payroll for the corresponding period two years before. This was partly due to the employment of increased forces, but after making allowance for the increase in forces it is believed that the current wages and salaries are at an average about 20 per cent over the wages and salaries of two years ago.

In common with all other carriers in the country, your company sought for relief in increasing its rates, but was denied, the denial being based on our large earnings. It was unfortunate that when the case was decided the large earnings were plainly visible, the greatly enhanced expense had not yet come clearly into view; and this same condition prevailed up to the end of the fiscal year for which this report is made. But the expenses are now beginning to tell on all the carriers, and somewhat later conditions may cause us to revise our rates.

Relations with the public, our patrons, continue good. In common with all other carriers, we have given assurances to the Government that its business of all kinds is to be given preferential movement, but we hope to be able to carry out the promise without serious inconvenience to those who desire to travel or to ship their customary freight. It may be, however, that we shall have to ask for a little patience on the part of these latter.

The faithful and efficient services of the officers and employees of the Company are again acknowledged with pleasure by your Directors.

EDWARD P. RIPLEY,
President.
WALKER D. HINES,
Chairman.

Railway Officers

Executive, Financial, Legal and Accounting

George F. Hawks, general manager of the El Paso & Southwestern at El Paso, Tex., has been elected vice-president and general manager in charge of operation, effective October 24.

C. E. Denney, special engineer to the president of the New York, Chicago & St. Louis, at Cleveland, Ohio, has been appointed assistant to president with headquarters at Cleveland, effective November 1.

W. L. Park, vice-president of the Illinois Central at Chicago, has been granted leave of absence for the duration of the war and has been appointed first vice-president of the Chicago Great Western, with headquarters at Chicago.

C. L. Mayne has been elected president of the Arkansas Central, with headquarters at Fort Smith, Ark., succeeding J. W. Daniels, resigned to become superintendent of the Missouri Pacific at Little Rock, Ark. F. H. Fennessy has been appointed claim agent.

M. J. Caples, vice-president of the Hocking Valley at Columbus, Ohio, has been appointed resident vice-president, representing the Chesapeake & Ohio, the Chesapeake & Ohio of Indiana, and the Chesapeake & Ohio Northern, in an executive capacity, with office at Columbus.

A. Mackrille, general auditor of the New York, New Haven & Hartford and the Central New England at New Haven, Conn., has been appointed auditor of revenue, and T. M. Prentice, auditor, has been appointed general accountant, with headquarters at New Haven. The offices of general auditor, auditor of miscellaneous receipts and auditor have been discontinued.

Benjamin Lamar Bugg, whose election as vice-president and general manager of the Atlanta, Birmingham & Atlantic, with headquarters at Atlanta, Ga., has already been announced in these columns, was born on August 8, 1869, at Palo Alto, Miss., and was educated in the high schools. He began railway work in 1887 with the Florida, Central & Peninsular, now a part of the Seaboard Air Line. In 1891 he went to the Georgia Southern & Florida and in 1895 left that road to become terminal agent of the Central of Georgia at Savannah, Ga. He was appointed general agent of the Old Dominion Steamship Company at Norfolk, Va., in 1907; in 1910 he was appointed traffic manager of the Norfolk Southern at Norfolk, and in 1912 he was appointed traffic manager of the Atlanta, Birmingham & Atlantic, later becoming assistant general manager. In March, 1916, he was promoted general manager, and now becomes vice-president and general manager of the same road, as above noted.

Operating

E. E. Hanna, trainmaster of the Missouri, Kansas & Texas, at Oklahoma City, Okla., has been promoted to superintendent with the same headquarters, succeeding S. H. Charles, resigned to enter other business.

George F. Warner, assistant trainmaster of the Delaware & Hudson at Oneonta, N. Y., has been appointed trainmaster of the Pennsylvania division, with office at Carbondale, Pa., vice H. F. Booth, resigned; and John H. Kilker has been appointed chief train dispatcher of the Pennsylvania division, vice R. A. Siegel assigned to other duties.

George W. Neilson, chief clerk in the office of the general superintendent of the Spokane, Portland & Seattle, at Portland, Ore., has been appointed superintendent of the Pacific & Eastern, with headquarters at Medford, Ore., succeeding G. E. Johnson, who has been appointed superintendent of the Gales Creek & Wilson River at Wilkesboro, Ore.

F. F. Riefel, superintendent of the Detroit division of the New York Central lines at Detroit, Mich., has been appointed superintendent of the Michigan division, with office at Toledo, vice E. Thwaites, transferred as superintendent to the Toledo division,

with office at Cleveland, vice E. R. Bissell, who has been appointed superintendent of the Detroit division, vice Mr. Riefel.

John A. Carson has been appointed superintendent of steamers of the Southern Pacific Company, Pacific system, with headquarters at San Francisco, Cal., with jurisdiction over all floating equipment, vice William Chisholm, resigned, and J. J. Jordan, trainmaster at Roseville, Cal., has been appointed assistant superintendent of the Coast division, in charge of San Francisco terminal.

C. E. Hair, whose appointment as assistant general superintendent of the Chicago, Terre Haute & Southeastern, with headquarters at Terre Haute, Ind., was announced in the *Railway Age Gazette* of October 19, began railway work on January 2, 1906, as a clerk in the freight department of the Chicago, Burlington & Quincy at Chicago. He held various positions until August, 1909, when he was made secretary to the freight traffic manager, leaving the Burlington in May, 1913, to enter the service of the Chicago, Terre Haute & Southeastern as secretary to the president. Mr. Hair retained the latter position until his appointment on August 20, as assistant general superintendent, with headquarters at Terre Haute.



C. E. Hair

A. E. Knights, trainmaster of the Great Northern at Havre, Mont., has been promoted to superintendent of the Montana division, with the same headquarters, succeeding C. E. Leverich, resigned, effective October 25.

William F. Giles, whose appointment as superintendent of the Chicago, Burlington & Quincy, at Brookfield, Mo., was announced in the *Railway Age Gazette* of October 5, was born at Aurora, Ill., on August 17, 1869.

He was educated at Valparaiso University, Valparaiso, Ind., and entered railway service with the Burlington on August 17, 1888, as a telegraph operator, remaining in that position until 1893. From December, 1903, to January, 1905, he was an electrician on the Burlington, and from the latter date until 1907 was supervisor of signals. He was then trainmaster until 1911, when he was promoted to assistant superintendent, remaining in that position on the Brookfield and Beardstown divisions, until October 1, 1917, when he was appointed superintendent of the Brookfield division, succeeding W. A. Chittenden, transferred to Beardstown, Ill.



W. F. Giles

Fred Wear, whose appointment as superintendent of the Butte division of the Great Northern, with headquarters at Great Falls, Mont., was announced in the *Railway Age Gazette* of October 5, was born at London, Ont., on July 22, 1868. He began railway work in 1885 as clerk for the Grand Trunk at Windsor, Ont., and from 1886 to October, 1888, was a brakeman on that road. He was subsequently conductor and yardmaster for the Toledo, St. Louis & Kansas City until June, 1906, and from the latter date to April, 1908, was with the St. Louis

& San Francisco as conductor and yardmaster. He then became general yardmaster for the Ann Arbor at Cadillac, Mich. In December, 1909, he went to the Great Northern as general yardmaster at Great Falls. He was promoted to trainmaster in 1911 and served in that capacity on the Butte, Kalispell, Mesabi and Fergus Falls divisions until his recent appointment as division superintendent, as above noted.

F. H. Hammill, whose appointment as general superintendent of the northern district of the Union Pacific, with headquarters at Omaha, Neb., was announced in the *Railway Age Gazette* of October 26, was born at Rockford, Ill., on January 23, 1872. He entered railway service with the Chicago & North Western in September, 1887, and from 1888 to 1902, was employed by the Chicago, Milwaukee & St. Paul successively as telegraph operator and train dispatcher. He then returned to the Chicago & North Western as train-dispatcher, and was consecutively trainmaster, assistant superintendent, superintendent, and assistant general superintendent in charge of Iowa lines, with headquarters at Boone, Iowa, until October 20, when he was appointed general superintendent of the northern district of the Union Pacific.



F. H. Hammill

R. W. Mitchener, superintendent of transportation of the New York, Chicago & St. Louis, at Cleveland, Ohio, has been appointed general superintendent with headquarters at Cleveland, and the office of superintendent of transportation has been abolished. A. A. Pearce has been appointed superintendent of freight transportation with headquarters at Cleveland, a newly created position.

J. W. Daniels, whose appointment as superintendent of the Arkansas division of the Missouri Pacific, with headquarters at Little Rock, Ark., was announced in the *Railway Age Gazette* of October 19, began railway work at the age of 13 with the St. Louis & San Francisco. When 14 years of age he was night operator and at 18 years was train dispatcher. He became connected with the Missouri Pacific in 1894 as train dispatcher and served successively as chief dispatcher, trainmaster and superintendent of various divisions. In October, 1916, he was elected president of the Arkansas Central, with headquarters at Ft. Smith, Ark., which position he held until his recent appointment as division superintendent of the Missouri Pacific, with office at Little Rock, as noted above.



J. W. Daniels

J. T. Gillick, assistant general manager of the Chicago, Milwaukee & St. Paul, at Chicago, has been promoted to general manager of the lines east of Moberg, S. D., succeeding P. C. Hart assigned to other duties. Macy Nicholson, assistant to vice-president in charge of operation of the Great Northern, at St. Paul, Minn., has been appointed assistant general manager of the Chicago, Milwaukee & St. Paul, succeeding Mr. Gillick.

Effective November 1. A portrait of Mr. Gillick and a sketch of his railway career were published in the *Railway Age Gazette* of July 13, 1917, page 89.

W. H. Foster, whose appointment as general superintendent lines west of the New York, New Haven & Hartford, with headquarters at New Haven, Conn., has already been announced in these columns was born on June 8, 1866. He began railway work in 1882, as an operator on the Pennsylvania Railroad and in 1888, entered the service of the New York, New Haven & Hartford as an operator and dispatcher. In 1903 he was appointed chief dispatcher and five years later became trainmaster. He was appointed division superintendent in 1912, and since May, 1917, was superintendent of the New Haven division at New Haven, Conn., until his recent appointment as general superintendent of the lines west of the same road, as above noted.

W. R. Hudson, general superintendent of the Chesapeake & Ohio at Covington, Ky., has been assigned to other duties, and the Cincinnati & Ashland divisions and the Chesapeake & Ohio Northern have been placed under the jurisdiction of L. B. Allen, general superintendent at Huntington, W. Va. The lines west of Hinton, W. Va. (Chesapeake & Ohio of Indiana excepted), will hereafter be known as the Western general division. The Chesapeake & Ohio of Indiana will be operated separately and the superintendent will report direct to the general manager. The Big Sandy division has been assigned to J. B. Harris, superintendent of the Ashland division and he has been relieved of the Cincinnati division and the Chesapeake & Ohio Northern. The jurisdiction of W. S. Taylor, superintendent Cincinnati Terminal division, has been extended over the Cincinnati division and the C. & O. N., with office at Covington, Ky. J. H. Carlisle, assistant superintendent of freight transportation at Richmond, Va., has been appointed fuel agent with headquarters at Huntington, W. Va. A. T. Lowmaster, superintendent of terminals at Chicago, has been appointed assistant superintendent freight transportation at Richmond, Va. W. D. Cummins has been appointed trainmaster, Cincinnati Terminal division at Covington, Ky. H. R. Davis has been appointed assistant trainmaster of the Cincinnati division and C. & O. N. at Russell, Ky. J. A. Barker, trainmaster at Peru, Ind., has been appointed superintendent of terminals of the Chesapeake & Ohio of Indiana at Chicago. W. M. Lynch, assistant trainmaster at Boston, Ind., has been appointed trainmaster with headquarters at Peru, and F. L. Poindexter has been appointed assistant trainmaster with headquarters at Boston. Effective October 28.

Traffic

F. J. Parker, division freight agent of the Michigan Central at Detroit, Mich., has been appointed assistant general freight agent, with office at Detroit.

W. H. Andrews, westbound contracting freight agent of the Toledo, St. Louis & Western at St. Louis, Mo., has been promoted to general agent at Los Angeles, Cal., to succeed F. M. Miller, resigned to enter military service.

G. N. Snider, coal traffic manager of the New York Central, at New York, has been appointed fuel transportation manager with the United States Fuel Administration, Washington, D. C.

A. S. Learoyd, general freight agent of the Delaware, Lackawanna & Western, at New York, has been granted leave of absence, and has been appointed on the staff of the Fuel Administration at Washington, D. C., to take charge of the distribution of anthracite coal.

A. E. Yardley, commercial agent of the Tennessee Central at Chicago, has been appointed commercial agent, with office at St. Louis, Mo., vice L. L. Beck, resigned, to engage in other business. Mr. Yardley will also continue as commercial agent at Chicago.

J. F. Reily, commercial agent of the Missouri, Kansas & Texas, at Sedalia, Mo., has been appointed general freight and ticket agent in Kansas, with headquarters at Parsons, Kan., succeeding L. B. Chipley, appointed industrial and colonization agent at Boston, Mass. O. C. Thomas has been appointed commercial agent at Tulsa, Okla., to succeed F. W. Dunn, transferred to Oklahoma City, Okla., in place of Mr. Thomas. C. R. Gordon has been appointed commercial agent at Sedalia, Mo., succeeding Mr. Reily.

S. L. Jones, assistant New England agent of the Central of Georgia at Boston, Mass., has been appointed New England agent at Boston, vice A. DeW. Sampson, retired under the company's pension system. Effective November 1.

The following have been appointed industrial and colonization agents of the Missouri, Kansas & Texas, effective October 1: L. B. Chiple, at Boston, Mass., formerly general freight and ticket agent at Parsons, Kan.; Chas. E. Osborne, at Pittsburgh, Pa., formerly chief rate clerk in the general freight office at Dallas, Tex.; L. E. O'Leary, at Cleveland, Ohio, and A. Bryant, at Chicago, both previously connected with the industrial department at St. Louis, Mo.; Chas. L. Knox, at Omaha, Neb., formerly traveling freight claim agent in Texas.

Albert P. Chapman, Jr., whose appointment as assistant general passenger agent of the Chicago, Milwaukee & St. Paul was announced in our issue of August 3, was born at Hartford, Wis., on January 7, 1865. He first entered railway service as a ticket clerk and operator on the St. Paul at Watertown, Wis. He remained at Watertown until 1887, when he was made assistant ticket agent at Milwaukee, Wis. In 1900, he was appointed city ticket agent at Chicago and in 1911, went to Seattle, Wash., to become general agent of the passenger department, which position he continued to hold until his promotion to assistant general passenger agent with the same headquarters on August 1, 1917.

M. A. Patterson, whose appointment as general freight agent of the Chicago, Rock Island & Pacific was announced in the *Railway Age Gazette* of September 28, first entered railroad

service in January, 1879, as a clerk in the local freight office of the Illinois Midland at Peoria, Ill. In October, 1881, he went to the Chicago, Rock Island & Peoria as a clerk in the local freight office at Peoria and subsequently was made chief clerk. From November, 1884, to June, 1898, he was chief clerk to the general freight and passenger agent of the Rock Island & Peoria, an independently operated part of the Rock Island system, at Rock Island, Ill., and the following four years was general freight and passenger agent. On July

1, 1902, when the R. I. & P. was consolidated with the other Rock Island lines, he was appointed assistant general freight agent at Rock Island, later being transferred to Davenport, Ia., with jurisdiction extended over the Peoria, Iowa and Missouri divisions. On July 1, 1903, he was made assistant general freight agent at Kansas City, Mo., with jurisdiction over lines west of the Missouri river, and in November of the following year was transferred to Chicago with the same title and with jurisdiction over the lines east of the Missouri river, in special charge of coal, lumber and livestock traffic, the duties of the position being subsequently enlarged to cover freight traffic in general in the same territory. On September 13 last Mr. Patterson was promoted to general freight agent of the lines east, as noted above.

Frederick E. Hollingshead, whose appointment as assistant general freight agent of the Chicago, Burlington & Quincy, with headquarters at St. Joseph, Mo., was announced in the *Railway Age Gazette* of October 12, was born at Trumansburg, N. Y. He began railway work on October 5, 1887, in the local freight office of the Burlington at Kansas City, Mo., where he was employed as clerk in various capacities until August, 1894, when he was made chief clerk. In November, 1896, he was appointed chief clerk in the general southwestern agent's office, and in August, 1899, was appointed soliciting freight agent, with headquarters in the same office. In December, 1902, he became chief clerk to the general freight agent at St. Louis, Mo., and in September, 1905, was transferred to Hannibal, Mo., as general

agent, which position he held until October 12, of this year, when he was promoted to assistant general freight agent.

Frederick Montmorency, whose appointment as general freight agent of the Chicago, Burlington & Quincy, with headquarters at Omaha, Neb., was announced in the *Railway Age Gazette* of



F. Montmorency

October 12, was born on September 26, 1870. He entered the service of the Burlington on July 1, 1888, as a clerk in the freight claim department at Omaha, and on December 1, 1898, he was made chief clerk to the superintendent of the McCook division, at McCook, Neb. He was appointed assistant general freight agent of the lines west of the Missouri river on September 1, 1900, which position he held until October 5, 1917, when he was promoted to general freight agent of the lines west of the Missouri river, as above noted.

E. B. Wilkerson has been appointed general agent in the freight department of the Missouri Pacific, with headquarters at Wichita, Kan., succeeding S. H. Kilgore, transferred, effective November 1.

Thomas Denton Geoghegan, whose appointment as traffic manager of the Gulf, Mobile & Northern, with headquarters at Mobile, Ala., has already been announced in these columns, was

born on April 8, 1888, at Louisville, Ky., and was educated in the Louisville Normal Training High School. In December, 1903, he began railway work with the Southern Railway as a file clerk in the office of the assistant freight traffic manager at Louisville, Ky., and was in the continuous service of that road until his recent appointment as traffic manager of the G., M. & N. He served as tariff clerk at Louisville, then as correspondence clerk until November, 1906, when he became assistant tariff clerk in the general freight office at Atlanta,

Ga. He was then consecutively assistant quotation clerk at Atlanta; quotation clerk, and later assistant chief clerk at Washington, D. C. In May, 1909, he was appointed chief clerk at Columbia, S. C., then was rate clerk at Atlanta, and later assistant chief clerk at the same place. In June, 1911, he was appointed chief rate clerk and subsequently became chief clerk in the office of the freight traffic manager at Washington, D. C. In February, 1917, he was appointed chief clerk in the office of the vice-president at the same place, which position he held at the time of his appointment as traffic manager of the Gulf, Mobile & Northern, as above noted.

Engineering and Rolling Stock

A. A. Cross, has been appointed assistant engineer of the New York, New Haven & Hartford, with office at New Haven, Conn., to succeed E. O. Carlson, who has entered military service.

H. J. Graeser, office engineer of the St. Louis Southwestern of Texas, at Tyler, Tex., has been promoted to division engineer, with headquarters at Mount Pleasant, Tex., succeeding T. J. Williams, Jr., resigned, effective October 3.



M. A. Patterson



T. D. Geoghegan

G. W. Corrigan, division engineer of the Stockton division of the Southern Pacific at Stockton, Cal., has been appointed division engineer of the San Joaquin division, vice J. P. Edwards, resigned, and J. B. Dawson has been appointed division engineer of the Stockton division, vice Mr. Corrigan.

L. S. Kinnaird, whose appointment as superintendent of motive power of the Chicago & Eastern Illinois, with headquarters at Danville, Ill., was announced in the *Railway Age Gazette* of October 5, was born on July 23, 1869, at Ft. Wayne, Ind., and graduated in mechanical engineering from Purdue University in 1896. He began railway work in 1890 as a draftsman for the Pennsylvania Company, serving in that capacity until September, 1892, when he entered Purdue. He worked as a special apprentice in the shops of the Pennsylvania Company during the summers of 1893, 1894 and 1895, and on July 5, 1896, took permanent employment with that company as a special apprentice. On January 1, 1900, he was appointed assistant master mechanic at Allegheny, Pa., and on November 20, 1902, he was appointed master mechanic of the Cleveland, Akron & Columbus at Mt. Vernon, Ohio. Mr. Kinnaird was appointed master mechanic of the Pittsburgh, Cincinnati, Chicago & St. Louis, at Logansport, Ind., on June 1, 1915, which position he resigned on September 30 to become superintendent of motive power of the Chicago & Eastern Illinois.

Charles Lee McIlvaine, who has been appointed superintendent of motive power of the Northern division of the Pennsylvania Railroad, with headquarters at Buffalo, N. Y., as has already

been announced in these columns was born on September 25, 1872, at Wilmington, Del., and graduated from the mechanical engineering department of the University of Pennsylvania. On October 1, 1899, Mr. McIlvaine entered the service of the Philadelphia, Baltimore & Washington, as a machinist apprentice in the Wilmington shops, and was promoted to the Altoona (Pa.) shops of the Pennsylvania Railroad in January, 1901. He was appointed draftsman in the office of the superintendent of motive power at Jersey City, N. J., in January, 1903, and two years later, was promoted to motive power inspector. In May, 1905, he became assistant master mechanic at the Pavonia shops, Camden, N. J., and two years later, he was appointed assistant engineer of motive power of the Buffalo & Allegheny Valley division, at Buffalo, N. Y. On September 1, 1910, he was transferred to the Erie division and Northern Central Railway at Williamsport, Pa., in the same capacity, and in May, 1911, assumed these duties under the general superintendent of motive power, at Altoona, Pa. He was promoted to master mechanic of the New York, Philadelphia & Norfolk on July 1, 1913, returning to the Pennsylvania Railroad in May, 1917, as master mechanic of the Philadelphia division and on October 10, was appointed superintendent of motive power of the Northern division, as above noted.



L. S. Kinnaird



C. L. McIlvaine

Purchasing

J. F. Esch has been appointed purchasing agent of the Colorado Midland, with headquarters at Colorado Springs, Colo., in place of C. N. Davids, resigned.

John E. Byron, whose appointment as general storekeeper of the Boston & Maine with headquarters at Boston, Mass., has already been announced in these columns, was born on December 4, 1874, at Concord, N. H., and received his education in grammar, high school and business college. He began railway work on April 25, 1892, as clerk and stenographer to the general manager of the Concord & Montreal, and on July 22, 1895, became superintendent's clerk on the Southern division of its successor the Boston & Maine. In November, 1911, he was appointed chief clerk in the maintenance of way department and in August, 1917, was appointed general storekeeper of the same road, as above noted.

H. A. Anderson who has been appointed assistant purchasing agent of the Pennsylvania Railroad, with headquarters at Philadelphia, Pa., as has already been announced in these columns entered the service of the Pennsylvania Railroad in July, 1883 as a messenger in the transportation department at Altoona, Pa. Three years later he was transferred to the motive power department where he served as clerk in the Juniata shops, and later as chief clerk to the general superintendent of motive power. In February, 1904, he was promoted to stock clerk in the purchasing department, and in December of the following year was made special agent of the purchasing department which position he held at the time of his recent appointment as assistant purchasing agent of the same road as above noted.

Railway Officers in Military Service

F. M. Miller, general agent, freight department, of the Toledo, St. Louis & Western at Los Angeles, Cal., has resigned to enter military service at American Lake, Wash.

S. A. Tubman, commercial agent of the Central of Georgia at Baltimore, Md., has been commissioned captain in the Quartermaster's Department of the United States Army.

E. O. Carlson, assistant engineer of the New York, New Haven & Hartford, at New Haven, Conn., has entered military service and is now with the Eleventh Regiment of Railway Engineers.

F. M. Smith, trainmaster of the Northern Pacific at East Grand Forks, Minn., who was granted a leave of absence on September 28, to enter military service, has been commissioned captain, Engineers' Corps, Second Company, Fort Leavenworth, Kan.

Woolsey Finnel, valuation engineer of the Mobile & Ohio, has been commissioned major, and H. Austill, bridge engineer, has been commissioned captain, in the Five Hundred and First Battalion, Twentieth Engineers; L. M. Pill, valuation engineer, has been commissioned captain in the Engineers' Reserve Corps.

OBITUARY

H. P. Elliott, freight claim agent of the Chicago, Milwaukee & St. Paul, at Chicago, died in that city on October 28.

Harry L. Moffett, trainmaster of the Illinois Central at Clinton, Ill., who was recently granted a leave of absence on account of ill health, died in that city on October 21.

Stephen Little, formerly and for many years secretary and controller of the Denver & Rio Grande, died on October 29 at his home in New York City at the age of 87. Mr. Little was born in Ireland and came to this country when a boy. In 1850 he began railroad work on the Pennsylvania Railroad. In 1859 he was appointed auditor of the Northern Central and remained with that company until 1874, when he went to New York City as controller of the Erie, then in reorganization. In 1886 he became controller of the Pullman Company. In 1891 he became controller and later also secretary of the Denver & Rio Grande. He resigned two years ago and retired. Mr. Little was a man of unusual attainments. As an expert in railroad accounting he was broad minded and thoroughly informed. Aside from his routine duties he undertook a number of important special commissions, including investigations of bankrupt roads, and his reports in such cases were noted for their lucidity and fairness and for the independent and impartial spirit manifested. His business standards were always the highest.

Railway Age Gazette

Volume 63

November 9, 1917

No. 19

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* Illustrated.

The two points that were most clearly brought out in the papers discussing the reconsignment privilege which were submitted to the *Railway Age Gazette* were, first, that the privilege is, under present regulations, outrageously abused; and second, that even where it is used for a legitimate purpose it costs

Reconsignment Privilege Contest

the railroad a substantial sum, and that in fairness to shippers who do not use the privilege, the railroads ought to charge for this privilege a sum commensurate with its cost. There were 22 papers submitted in this contest and the paper which was awarded the first prize of \$50 by the three judges—W. C. Loree, formerly general manager of the Baltimore & Ohio; R. S. French, manager and secretary, National League of Commission Merchants of the United States; and Nat Duke, assistant freight traffic manager, Delaware, Lackawanna & Western—is published elsewhere in this issue. There was a great deal of time and thought spent in the preparation of the papers submitted, as will be seen from even a casual reading of the one published this week. There was also a great deal of time and thought spent on the grading of the papers and it will be well worth while for anyone who has to do with the various phases of reconsignment, and especially for those having authority to regulate railroads, to read all the papers that the *Railway Age Gazette* will publish on this subject. The second prize paper will be published next week and others will follow from time to time. It is interesting to note that while the writers of these papers recognize the extent to which the reconsignment privilege is being abused, it was the consensus of opinion that for certain commodities and under certain conditions the reconsignment privilege, if properly charged for, performs a valuable economic function.

The decision of the Federal District Court in the case of the United States versus the Boston & Maine regarding a violation of the Safety Appliance Act concerning the "nearest available repair point," which was published in the *Railway Age Gazette* of November 2, page 773, shows that one Federal court appreciates the difficulties under which our railroads are working at the present time and is co-operating with them

to move the great amount of tonnage thrust upon them. The case in question involved a freight car moving West from Boston which had a drawbar pulled out from one end of the car and which was taken from the train at Gardner, Mass., 17 miles west of one repair point and 38 miles east of the next one. The railroad not having a car at Gardner into which the load of the damaged car could be transferred, did the logical thing any business concern would do, by coupling the damaged car with its one good coupler to the rear of a caboose of a freight train, without affecting the safety of train operation in any way, and moved the car on its westward journey to the repair point 38 miles west of Gardner. The government brought suit on a mere technicality, claiming that the car should have been moved back the 17 miles as that was the nearest available repair point. The Federal District Court by its action showed its desire to co-operate with the railroad which is highly commendable. Its decision was based on a practical and logical interpretation of the law, as the railroad showed that in no case was the purpose of the Safety Appliance Act violated.

The court decisions reported in this issue are mostly those of the United States Circuit Courts of Appeals, and the subjects dealt with are varied and interesting. Any one who thinks that the court news column is dull reading should take a look at these cases. In the Eighth Circuit the hours-of-service inspectors sent out by the Government are held—almost in so many words—to have been frivolous in their criticisms of railroad practice. Other decisions are so narrow, seemingly, that one is tempted to think the judges are frivolous, or at least exceedingly narrow, in their interpretation of the hours-of-service statute. In the Third Circuit the findings of the Interstate Commerce Commission as to the amount of an overcharge are accepted by the court only as prima facie evidence of the correctness of the amount. In the Fourth Circuit, in a suit where a woman in a passenger car, standing in the aisle, was thrown off her feet when the train rounded a curve, the court holds that the swaying and lurching which caused such a disturbance must be considered as a normal and necessary accompaniment of reasonable speeds where a railroad line is as crooked and steep as is the case

Common Sense Applied to Safety Appliance Act

in the mountains of West Virginia. In a New Jersey automobile case some joy riders sued a railroad, not because they were run into by a train, but because of the trouble that they got into when a train was struck by their car; they ran into the side of the train. They could have seen the approaching locomotive when they got to a point within fifteen feet of the tracks. This is a rather short distance; but the judge holds them responsible for not having been on the lookout in ample season; and this duty, says the decision, rested not alone on the driver of the car but also on the other five persons in it. This seems a rather severe doctrine for a female joy-rider, sitting on a young man's knee in the front seat; but courts cannot be expected to have much consideration for sentiment!

A NEW MOVEMENT BY THE RAILROAD BROTHERHOODS

NO doubt when Congress, in order to avert a general railway strike, passed the Adamson law, it thought it had laid the strike ghost indefinitely. But the ghost reappeared last spring. When the Supreme Court upheld the constitutionality of the Adamson act, Congress probably felt sure that the labor problem on the railways was solved for a while. But although it has been only a little more than a year since the law was passed, and will not be a year until January 1, 1918, since it went into effect, the very organizations for whose benefit it was enacted already are starting another movement for changes in their conditions of employment and advances in their wages.

Various reports are being published regarding this new movement. One is that an advance in wages of 25 to 50 per cent will be demanded. Whether an advance is to be asked merely for the conductors and trainmen in passenger service, or for all passenger train employees, or for all employees in both passenger and freight service, is not clear. The members of the United Switchmen of America also are preparing to present claims for advances in wages.

Another report is that the four large brotherhoods will press upon Congress at its next session a demand for legislation arbitrarily limiting and reducing the length of freight trains. Still another report is that the demands made directly upon the railways will include one for a differential wage scale based upon the length of freight trains. For example, employees operating a train of 50 cars would be paid on one basis, those operating trains of 75 cars on a higher basis, and so on.

In any event, it is evident that a new and important movement for a readjustment of the wages and conditions of employment of train service employees is being started. Present conditions make this fact one of great seriousness, not only for the railways, but also for the nation.

The railways are now handling very much the heaviest traffic, and making the largest gross earnings that they ever did. Never in their history were they managed as efficiently as now. The average loads per car and per train, the average mileages made per car and per locomotive daily, far surpass all previous records. Nevertheless, net earnings and net operating income are declining. Until recently this was true only of the eastern lines, although the *ratio* of expenses and taxes to total earnings has been increasing on roads throughout the country. Now the southern and western lines, like those in eastern territory, have begun to show absolute losses of net operating income. The net earnings and net operating income would show still heavier declines if expenditures for maintenance were being increased in proportion to the physical needs of the properties. Another big increase of wages, without a big advance of rates, would be disastrous to a large part of the railways of the country.

Whether such an increase in wages should be granted is one question. Whether it should be granted without the

need and justification for it having been previously passed upon by some body both impartial and competent is an entirely different question. The events which forced and those which followed the passage of the Adamson law, should have made startlingly clear to the public both the non-existence and the need for a law which would provide adequately for the peaceful and just settlement of labor controversies on railroads. The country narrowly escaped a general tie-up of the railways in September, 1916; it again narrowly escaped a general tie-up last spring, when we were just entering the war with Germany, and since we entered the war it actually has experienced a strike of members of the Brotherhood of Railroad Trainmen in the Chicago terminals.

If there was need for legislation providing means for peacefully settling railway labor controversies in peace, how much greater is the need for such legislation now that we are at war! It is futile to say that the brotherhoods would not call a strike when the country was in the midst of a great war. They did call one when we were just entering the war; and the Brotherhood of Railroad Trainmen ordered one in the Chicago terminals after we were at war. We believe the Chicago strike has been pronounced "illegal" but we observe that the men officially responsible for it still have the same positions and influence in the organization that they had before. The only sure means of preventing a general railway strike in the midst of the war is to prohibit it by law. At the same time there should be provided a fair means of arbitration. It need hardly be said that important as it is that labor disputes on the railways should be fairly and peaceably settled at any time, it would be suicidal for the country to permit a strike while it is involved in the present conflict.

Important as is the movement which is being started for advances in the wages of train service employees, hardly less important is the movement which apparently is being begun to in one way or another reduce freight train loads. At any time increases in freight train loads are desirable as means of promoting the economy and efficiency of railway operation. Without large carloads and large trainloads the low freight rates which have prevailed in the United States would have been impossible. Under existing conditions, however, the handling of traffic in large trainloads is not merely important. It is vital. It was difficult before we entered the war for the railways to increase their equipment and other facilities. The war has made increases in them practically impossible. This means that if the gigantic and rapidly increasing traffic of war time is to be handled at all, it must be done by every track, every car and every engine being worked to its utmost capacity. Now, a reduction or a limitation of the length of freight trains would operate as a limitation or a reduction of the amount of freight that could be handled with every track, every car and every locomotive.

Of course, we know the argument of the leaders of the labor brotherhoods is that the railways could increase the traffic handled with existing facilities by speeding up the trains, but to everybody who knows any mathematics and can apply them to the conditions of railroad operation this contention is grotesquely absurd. It is manifest that the faster a locomotive is run, the fewer cars it can haul; that the fewer cars it hauls in a train, the more trains must be run to handle a given traffic, and that the more trains are run, the more meeting and passing points there must be on the railroad. But the more meeting and passing points there are, the more delays there will be to trains from being held on sidings, unless there is a large increase in the amount of trackage of the railways. Furthermore, the freight locomotives now in service have been built for power, not for speed, and every increase made in their speed would in a greater proportion deprive them of the opportunity to use the power which they were built to exert.

The proposal to reduce the length of trains is necessarily a proposal to require the railways to run more trains. But for this purpose they would have to provide more locomotives and trackage, not to mention the fact that they would have to employ more men. But where, under present conditions, would they or could they get the additional locomotives? Where, under present conditions, would they or could they get the capital, the materials and the men necessary to build the additional trackage?

Any measure or wage scale which should be adopted to limit and reduce the length of freight trains under present conditions would be a measure to prevent, and effectively prevent, the railways of the United States from handling the country's business during the war. This is not the intent of it, but it would be the effect of it.

All questions arising regarding the conditions of employment and wages of railway employees should be submitted to arbitration. All questions arising affecting such matters as the number of men to be employed in train crews and the length of the trains to be operated should be submitted to the determination of the Interstate Commerce Commission. The country should not go on allowing such matters to be settled by the menace of strikes or the coercion of legislation passed without any investigation whatever.

PROTECTING SECURITY OWNERS' INTERESTS

ONLY a few roads go through even the form of attempting to hold a stockholders' meeting at which any considerable number of stockholders are present. The New York, New Haven & Hartford and the Southern Railway are two exceptions, but although the good intentions are there on the part of the management, actually the influence which these meetings have on the actions of the board of directors is infinitesimally small. The management which holds the great majority of the proxies of all the stock outstanding consults with one or a few dominating interests and pursues a policy agreed upon at these private conferences. A specific criticism founded on sound argument made at the stockholders' annual meeting would receive consideration, but on most roads if this criticism did not meet the approval of the controlling interests, consideration would amount to little more than notice and acknowledgment. It would not bring about a change in policy.

At this time, when the whole credit structure of American railroads is really in danger, when serious students of railway economics are suggesting that the Government lend money to the railroads, and others are suggesting that the railways sell short term paper to their banks to be rediscounted by the Federal Reserve Banks, it is well to face the facts squarely. There are very few railroads in this country in connection with which it is not easy to name almost off-hand one to half a dozen individuals who actually control the broad policies and select the operating management. In some cases this controlling interest is a banking house, more often it is one or more individual wealthy men working in conjunction with a banking house. A typical example of this latter is the New York Central, with its Vanderbilt control and its banking arrangement with J. P. Morgan & Co.

When there is trouble and a road goes into bankruptcy, protective committees, so-called, are formed by the different classes of security holders, and these committees represent the interests of the security holders in negotiations looking toward a reorganization. The theory, of course, is that the board of directors is the protective committee for all the stockholders as long as the road is solvent and that the investment bankers who sell an issue of bonds or notes act as a protective committee as long as the road is solvent for this class of securities. As a matter of fact, American railroad practice has not in a great number of cases worked out in this way, and the great majority of stockholders of

an American railroad and the great majority of investors in its bonds and notes are at the mercy of the few who are in control. There are plenty of examples in American railroad history where the man or men in control have not only exercised the power which they have, but have conscientiously and disinterestedly lived up to the full responsibility which rests on them under the American system. The Pennsylvania Railroad and the Atchison, Topeka & Santa Fe are the first two companies that come to mind; they are not, of course, alone, but there are altogether too many of the other kind of companies.

In the first place, ought not a banking house which sells an issue of bonds or notes to its customers, take the responsibility of protecting these customers' interests more seriously than most banking houses do now? It is not enough that a member of a banking house which is financing a road, hold the title of director and be present to render the dignity of his presence and his vote to the plans of the controlling interest. There should be some one continuously watching the detailed operations of the road in the interests of stockholders, other than the controlling interests, and in the interests of bond and note holders. There are, of course, a great number of difficulties in the way of devising any practical plan by which this could be put into effect. In government, the two party system is supposed to provide the necessary check. There have been temporary two-party systems in railroad directorates. There are two parties now struggling for supremacy in the Rock Island directorate, but in railroad directorates this does not last long. One or other party gets the upper hand, gets control of the machinery necessary to completely eliminate the other faction, and we have again irresponsible—in the sense of being responsible only to themselves—controlling interests.

The great difficulty lies in the fact that were the interests of investors to be aroused temporarily to a realization of their lack of protection, and were the holders of each class of securities to elect a competent representative to watch the detailed operations of the management and of the controlling interests, to the end that the great majority of security holders would be protected, the men so elected would in a very short time be held responsible, at least until disaster occurred, only by their own sense of duty. Sustained interest on the part of investors is almost more than can be hoped for.

At first glance this seems a problem primarily of concern to the bankers, but as a matter of fact it is of vital concern to railroad men who believe that railroads should continue to be privately managed and privately financed. If the bankers, or some of them, should refuse to assume the responsibility of refinancing maturing obligations and of raising new capital necessary for development to meet the growing needs of the country, it will be railroad executives who will suffer along with the security holders, whose representative they ought to be. It is a subject which deserves the consideration of such bodies as the Executives' Advisory Committee and the Railroads' War Board.

SPENDING MONEY IN LEAN YEARS

ON another page of this issue an account is given of one of the most extensive grade revision and double track projects undertaken in recent years. It is worthy of notice that this work of the Southern between Washington and Atlanta had its inception and saw considerable progress during the early months of the great war, a time when this country was suffering a serious financial depression. The undertaking has been continued during the period of war prosperity and into the time of our own participation in the world conflict. Consequently the officers of the Southern have had an excellent opportunity to observe the marked difference between the cost of construction as carried on in slack times and the cost of work done during periods of

high prices, and have thus been afforded ample proof of the wisdom of the policy they pursued in undertaking the improvement during a time of tight money.

This policy is in marked contrast to that followed by not a few American railways, many of which have enjoyed much better financial credit than the Southern. Some roads undertake work when traffic is heavy, and when as a rule both material and labor are scarce and the construction will suffer the maximum interruption from the traffic. These same roads are also usually the first to order a severe retrenchment at the first sign of a decrease in earnings with the result that the completion of improvements which already represent investments on a large scale is delayed for many months with a consequent loss of interest. The Southern, on the other hand, had the courage to start an important project when its earnings were at low ebb, but it has profited handsomely from this course since the capitalization of large parts of the improvements is materially less than it would have been had its officers required the moral support of the heavy earnings of 1916 before proceeding with the work.

RAILROAD RATES AND NATIONAL DEFENSE

THE outstanding point in the testimony given by the presidents of the large eastern railways in the rate advance case at Washington last Monday is the need for larger earnings with which to maintain the physical properties of the roads. Thus far they have been able to move the commercial and military traffic in spite of its enormous increase, but with present rates they have not enough revenues to get the labor and materials necessary to keep the properties up physically. If they are allowed to deteriorate much more they will become incapable, not merely of handling a still larger traffic, but even of handling a traffic as large as the present. This general thought permeated what was said by all the witnesses for the railways. By none was it more frankly and emphatically expressed than by President Willard of the Baltimore & Ohio, who is also chairman of the government's Advisory Commission on National Defense.

The *Railway Age Gazette* was, we believe, among the first to point out that, difficult as was the problem of handling all the commercial and military traffic, the problem of adequately maintaining the railways was becoming even more difficult and serious. Of course, in the long run, the two problems merge into each other. If the railways are not adequately maintained, they will go to pieces physically and if that occurs they will soon get so they cannot handle an abnormal traffic or even a normal traffic.

The question of the regulation of rates has ceased to be merely an economic question. It has become a problem of national defense. The government is now regulating the prices of many commodities—of steel, of coal, of wheat, and so on. In regulating them it recognizes the fact that prices must not be made so low as to hamper production. Every price that has been fixed is much higher than the average price of the same commodity in the years before the war. In all industries the cost of labor and materials has advanced; and the government has recognized the fact that if its prices are not fixed high enough to cover these increased costs, and at the same time afford a reasonable profit, the maintenance and increase of production, which are vitally necessary for the successful prosecution of the war, will not be secured.

There is one fundamental difference between the situation of other industries and that of the railways. While in other industries great increases in prices have occurred, in the railway industry the average rates received are little, if any, higher than they were before the war in Europe commenced. The railways, however, have been subjected to increases in the cost of labor and materials as great as those which other industries have had to meet. Important as it is that the prices of steel and coal and wheat should be so

fixed as not to discourage the production of these commodities, it is even more important that railway rates should be so fixed as not to restrict the production of transportation. The manufacture of steel in increased quantities is absolutely dependent upon the ability of the railways to transport from the mines to the factories the coal and the ore which must be used in making steel. The farmer may temporarily enlarge his production of wheat without adequate transportation facilities; but when the time comes that the railways are unable to move his crops he will be effectually debarred from maintaining his production, and the consumer will be cut off from the increased crops which he has produced.

The statistics show that there has been a large advance in the expenditures of the railways during the present year for the maintenance of equipment and maintenance of way, but this advance does not represent an increase in the use of labor and materials. It is due entirely to the fact that labor and materials cost more. The amount of labor and materials actually used has declined. Furthermore, for about two years, and especially during the present year, the railways have been moving a vastly increased business with almost no additional facilities. The old rails, the old cars and locomotives are wearing out. A certain part of them must be replaced every year if the total available equipment is not to decline. The money for maintenance and for replacements must come from earnings.

The situation of the eastern carriers as described by their presidents is anything but encouraging. During the nine months ending on October 1, as compared with the same months of 1916, the earnings of 38 of these lines increased \$124,000,000, while their operating expenses advanced \$169,500,000, and in consequence net operating income declined \$57,300,000. This decline in net is continuing and becoming larger. Months ago it was foreseen that it was only a matter of time until the western and southern lines also would begin to show losses in net return; and recently what was then foreseen has begun to occur. The effect of the course of events on railroad credit and upon the value of railroad securities has been very serious. It is estimated that the total depreciation in the market value of railroad stocks and bonds since America was drawn into the war has been \$3,000,000,000.

In almost every other leading country conditions created by the war have rendered it necessary to make substantial advances in railway rates. The railways of the United States have been granted some advances, but they are wholly insufficient. Since the railway question has become a question of national defense it should be dealt with accordingly. The fact that it is in the hands of the Interstate Commerce Commission does not alter its character.

NEW BOOKS

Poor's (Intermediate) Manual of Railroads, 1917. Published by Poor's Manual Company, 80 Lafayette Street, New York. Price, \$7.50.

This intermediate manual supplements the regular fiftieth annual number, which was published about six months ago, by giving reports for all of the principal railroads for the year or for the six months ended December 31, 1916. This, of course, is to conform with the change in practice prescribed by the Interstate Commerce Commission, making the period for reporting to the commission the calendar year instead of the fiscal year ending June 30. The majority of railroads have changed their period of making reports to stockholders to correspond with the Interstate Commerce Commission's requirements. Some, however, have not. Poor's gives income account, balance sheet, operating statistics, etc., for those that did not change their period for reporting to stockholders as well as for those that did. As a link between the fiftieth annual number and the next annual the intermediate manual is a necessity.

Letters to the Editor

WOODING'S AUTOMATIC STOP

NEW YORK CITY.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Your article on "Wooding's Automatic Train Stop" in the issue of September 17, composed largely of selections taken from the Interstate Commerce Commission's report, with the brief comment that three pages of the report are devoted to a discussion of failures, cannot help creating an erroneous opinion. * * * Contrary to the impression caused by the statement that three pages are devoted to discussion of failures, there was not demonstrated a single instance in which the train was not fully protected by the automatic train stop, during the test. Hence, in the true sense, there was not a single failure to be discussed.

There were eleven irregular operations, principally of the permissive control mechanism, called failures, that were easily overcome, but not one of which prevented the automatic train-stop appliance from protecting the train in case of danger.

Six were caused by a partial separation of a break in a faulty construction and installation, that permitted the observer by an act to pass the train at a higher speed than intended; but even under this extreme adverse condition it would require the engineer in actual operation to recognize the danger signal, and act, or the brakes would be applied and the train stopped in safety. One was caused by a loose connection or ground on the engine. One by the U-blade opening the line wire circuit breaker at ramp S-56; two by the signal maintainer cutting off the battery. These four caused a brake application not intended. The eleventh and last was a break-down-test, in which the appliance clearly demonstrated that it was active and ready to fully protect both the appliance and the train as designed; but it was purposely held from doing so.

The causes for all the irregularities that occurred were easily overcome as soon as demonstrated, and they would not have appeared in the Commission's report had time permitted an opportunity to test out the new parts in advance.

The contacts operated perfectly throughout one of the severest sleet storms of this climate; and also when water was poured on them in zero-weather, producing conditions considered the most difficult to be overcome.

The permissive control (not speed control) did all that was required or is of advantage in such an appliance (see paragraph 2, page 18, of the Commission's report). It demonstrated that an engineer, to be sure of getting by with his train, must reduce its speed two miles an hour below that for which the appliance is set. The meagerness of the data on which a positive opinion was withheld was due entirely to the fact that the installation was on a fast passenger train and longer time could not be had; and not to any fault of the device.

This appliance has demonstrated that it provides the protection now required; the protection not now afforded by the highest training of the employees and the latest approved signaling system and equipment. The Interstate Commerce Commission says that it can, no doubt, be developed to meet the needs of any railroad. The mechanical parts are so few and uncomplicated that the most critical expert will approve of them. In addition, this appliance will enable the railroads to safely increase traffic from 10 to 25 per cent on heavily congested roads.

B. F. WOODING.

[The reader will note that the issue is simply a question as to the meaning of the word "failure." The Interstate

Commerce Commission's inspector, following the practice of signal engineers generally, uses this word to designate any operation, or any absence of operation, wherein the apparatus does not accomplish exactly what it is intended to accomplish; whereas Mr. Wooding uses the word only in cases where the movement, or the failure to move, immediately involves a dangerous condition. If a train-stop apparatus allows a train to pass, when it ought to cause an application of the brakes, that is a failure to which everybody applies the same name; but if the apparatus stops a train when the road ahead is clear, and no stop is necessary, the term "non-dangerous failure" is commonly used. In that case, the only direct disturbance is a delay to the train. But a delay may cause much inconvenience. With long and heavy trains unnecessary stops are the *bête noire* of railroad men, because of the frequency with which drawbars are broken or damaged, in making the start, after the stop. These breakages may be due, in large measure to the bad tempers of the enginemen, who, when they are irritated by a delay which they deem unnecessary, handle the throttle with less caution than at other times; but the thing that is supposed to have caused the stop is saddled with the blame, nevertheless. Again, the signal engineer must reduce the number of unnecessary stops to the lowest possible degree for the reason that all enginemen are entitled to feel, constantly, the most complete confidence in the reliability of every apparatus or appliance which may affect the safety of their trains. If there are many unnecessary stops, the men's confidence in the perfection of the apparatus is weakened; and the ambitious signal engineer very naturally, therefore, classes as a failure anything which causes those stops, and which, in so doing, impairs his reputation.—EDITOR.]

ADVANTAGES OF TABLE D'HOTE SYSTEM FOR DINING CARS

CHICAGO.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

While our railroads have accomplished what was thought impossible in successfully transporting troops, government freight, etc., without disorganizing the passenger service, very little or nothing has been done toward remedying the waste in railway dining car service.

Your editorial of May 25 discussing this subject, advocating radical changes and suggesting that we do away with "the almost criminal *a la carte* system so generally in vogue in this country," was splendid, and it is a pity that it was not followed by more articles on the same lines. Worse still, the only follow-up was the publication of a letter from "the passenger traffic manager of a large railway system," in your issue of July 13, who condemned the editorial in question.

I have been watching every issue of the *Railway Age Gazette* since, hoping to find that some real, experienced railway officer (a practical dining car superintendent, for example) would take up the matter and show how well you had hit the nail on the head with your first editorial.

Believing that the present cry for conservation of food should be seriously considered, and believing that it is imperative that we should realize the importance of such saving, I, a small cog in the dining car service, take the liberty of calling your attention to this, hoping that you will take up and continue the fight along the lines suggested in your editorial of May 25.

With all due respect to "the passenger traffic manager," who wrote the letter above mentioned, I beg to differ with his views. Why should a passenger traffic manager be considered an authority on such a question? Unfortunately this has been done for years, and it is the very reason why "there is no part of our railway service which needs drastic reformation more than our dining car service."

The idea that the table d'hôte plan is more wasteful than

our present a la carte is wrong. It is based on results from the table d'hôte system used years ago, and not on the modern way of serving table d'hôte. The passenger traffic manager in question, makes the following charges against this system: 1st. It requires the preparation in advance of a lot of food, much of which is not used. 2d. It permits the passenger to order many things not wanted. 3d. It allows the waiter to bring food not ordered.

None of those charges can be proved correct, nowadays, because: 1st. With competent dining car conductors and chefs, there is no reason why there should be any food prepared in advance and not used; there is always use for every bit of food, if you know how. 2d. By giving the passenger the right to order soup, for example, with choice of one meat or fish, two vegetables, one dessert and drink; and by requesting the passenger to write the order on a check, as it is done to-day with the a la carte system, the passenger will only order what is wanted. 3d. When every order is written on a check, checks are required to get orders out of the kitchen, and the taking of verbal orders is absolutely forbidden; waiters will not be able to bring food not ordered.

The reason why the old table d'hôte system has been condemned, was not because of the system itself, but of the abuses practiced in those days. Menus were too elaborate, with from two to four or five relishes, two or three soups, two kinds of fish, half a dozen entrees, a roast or two, punch, a game, salad, all kinds of pastry, ice cream, hot or frozen pudding, cheese, fruits, etc. On top of all this passengers had the right to order any or all the items on the menu. Orders in those days were taken verbally, and I well remember how they were given. A passenger would mention the one or two articles which most appealed to his taste, at the same time telling the waiter to bring him anything else that looked good. No wonder the waiters would bring everything, from soup to nuts. First of all by so doing the waiter thought that he would get a larger tip, and again it was the *easiest* way to do his work, for it made it unnecessary for him to try to remember the different orders for different passengers.

A private office and not the press would be the proper place to give other *very important facts and figures* which prove that a properly conducted table d'hôte system *will save enormous quantities of food, man power and money* to both the railroad companies and the traveling public. H. F.

LOCOMOTIVES NOT DOING THEIR SHARE

NEW YORK.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

"How long can the railways continue to augment their efficiency enough to meet the demands upon them?" The *Railway Age Gazette* asks this question in the September 21 issue in an editorial headed "Railway Operating Efficiency in June" and giving the operating statistics for June of this year compared with June, 1916.

The question of how much our railways are going to be able to expand their transportation producing power has ceased to become of interest to railway men only. It has become national—even international in scope.

The first of the three tables quoted give a comparison of the revenue tons per mile of line. The average miles moved per day by a car is 29.1, having increased from 27.3. These figures, while they show a creditable improvement, also show that line mileage has not reached the point of saturation. Some roads go far beyond this figure. The Illinois Central, for instance, has been able to boost its average car miles per day to 43.36. Vice-President Kettle in a recently published interview commenting on the Illinois Central June figures said, "If business keeps up, and it is keeping up, we hope to do still better. We keep everything rolling. That is the trick."

Having established the fact that line mileage will be able to handle all the traffic our present locomotive and car equipment can be made to produce we must look to the cars and locomotives for an answer to the question of "How long can the railroads augment their efficiency to meet the demands made upon them?"

Under the remaining two headings the percentages given are as follows:

REVENUE TON MILES PER FREIGHT LOCOMOTIVE					
	U. S.	East.	South.	West.	
Per cent increase June, 1917, over June, 1916	21.0	17.4	15.6	29.9	
REVENUE TON MILES PER FREIGHT CAR					
	U. S.	East.	South.	West.	
Per cent increase June, 1917, over June, 1916	19.6	15.9	17.5	26.6	

The striking and significant thing about these percentages is the similarity of the increases of revenue freight locomotive ton miles and revenue freight car ton miles. Assume an average freight locomotive hauling 2,000 tons. It is fair to assume that 1,000 tons is revenue freight, the other 1,000 tons being the weight of the train. By increasing car loading 20 per cent our average train becomes 1,200 tons of revenue freight and 800 tons of train. We have more freight and in fewer cars and therefore an easier hauling train. A shorter heavier train is always easier to handle as is evidenced by the adjustment factor which has become standard practise.

With this in mind and again examining the percentages of increases it is apparent that pretty much all of the increase in revenue freight hauled has been obtained by heavier car loading and very little, if any, by heavier engine loading. The 27.9 tons does not measure the heaviest average car load that can be obtained, but it is three-quarters of the average capacity and further increases will be gained with increasing difficulty. Over and above this remains the, as yet untouched, increase from heavier engine loading.

To quote an operating man in a recent issue of the *Railway Age Gazette*. "Most engine ratings are made by the mechanical department, and the result is that our engines are under rated. While we make a good showing in engine efficiency we are losing in train load as against what our engines can actually handle."

During the last ten years average tractive effort of freight locomotives has increased 27 per cent because of the addition of modern heavy power. Revenue tons hauled per pound of tractive power have not kept pace with this increase. One authority has said that "during the last five years the economy and capacity of our locomotives have been more than doubled." This means that there is available hauling capacity beyond the figures expressed in the theoretical term "tractive power."

There is ground, therefore, to answer the *Gazette's* question in the most optimistic frame of mind. Who will be the leader in securing heavier engine rating?

OPERATOR.

A SOLUTION FOR THE UPPER BERTH QUESTION

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I wish to make the following suggestion in regard to "The Vital Objection to Upper Berths." It appears that your contributors (and I agree with them) consider the greatest objection to upper berths the lighting system. It would not be practical to extinguish all lights, save berth lights, during the night, on account of the dangers in walking through sleeping cars in complete darkness, but I believe that the Pullman company could rewire their cars to provide also for floor lights, say one in front of every other berth (or section). I have noticed that the floor lighting system works very well in some good moving picture theatres, and it may solve the problem on sleeping cars. H. F.

First Prize in Reconsignment Privilege Contest

Present Abuse of the Privilege and Reason Therefor. Suggestions for a New System Based on Sound Principles

THE three judges in the contest which the *Railway Age Gazette* conducted for the best papers discussing the reconsignment privilege, were W. C. Loree, formerly general manager of Baltimore & Ohio, R. S. French, general manager and secretary of the National League of Commission Merchants of the United States and Nat Duke, assistant freight traffic manager of the Delaware, Lackawanna & Western. In awarding the first prize of \$50 to H. G. Munholland and the second prize of \$25 to S. Wherry, the judges said in part:

We have read carefully, with a great deal of interest, the papers on the reconsignment privilege submitted to us, feeling as we do that the subject is one of importance both to the public and to the railroads, and after mature consideration place them in the following order of merit:

1. Paper by H. C. Munholland, assistant manager, Pacific Car Demurrage Bureau.

This paper is well written and in a convincing manner. The writer is fair to both the railroads and the shippers and his conclusions are reinforced by reliable statistical information. The following points are brought out in this paper:

(a) The privilege is of value to shippers, and when not abused or used for speculative purposes does not unduly delay the movement of cars.

(b) Promotes business of brokers with little or no capital to peddle cars from place to place in the hope of effecting a profitable sale, thereby tying up cars that would be of service in legitimate business.

(c) Promotes use of cars for storage purposes, thereby increasing the car shortage, detrimental to the interests of both the railroads and the public.

(d) Undue number of diversions permitted.

(e) Failure of the carriers to present a good case backed up by sufficient statistical information.

(f) Suggestions to remedy abuses of the privilege.

2. Paper by S. W. Wherry, assistant yardmaster, Pennsylvania Railroad.

This paper is also well written from the standpoint of the operating department of a railroad and explains very fully the delays to cars, due to diversion, and to the flow of traffic, on account of occasional adverse movements because of a car requiring diversion having passed the receiving yard.

The costs given would appear somewhat high, but these costs apply only to the yard referred to, which evidently handles largely dead freight, such as coal, lumber, etc., and the percentage of perishable is small. Probably the percentage of diversion of perishable freight is also small in this yard, as compared with other yards where the average delay is much less.

The other papers submitted we have arranged in accordance with the standing, which, in our judgment, is proper, after taking into consideration the elements of doubt contained in several of them, and the absence of data supporting the conclusions. These papers, however, all have merit and give evidence of careful consideration of the subject.

RECONSIGNMENT OR DIVERSION PRIVILEGES

By R. C. Munholland

Assistant Manager, Pacific Car Demurrage Bureau

The term "reconsignments" is often misunderstood. And, therefore, I will not confine my remarks to "reconsignments" alone. When cars are reconsigned, diverted, reshipped,

held for orders to switch to connection, stopped in transit, or set on hold tracks at destination and there held for disposition, the general purpose of one or all, is the same; that is, regular and through movement of car is retarded.

This leads to the question—are such privileges necessary? My answer is, generally, no, for if a shipper conducts his business properly, when a car is shipped all arrangements for final disposition and delivery should be arranged for, prior to loading and billing, but to be broad and liberal, if absolutely necessary to invoke any privilege, why should such shippers not pay a proper compensation to the railroads for such service?

The plan of allowing diversion or reconsignment on a through rate was no doubt started, originally, to build up certain classes of trade, and for wider distribution to take care of fluctuating conditions. Of late years the practice has grown to such an alarming extent that many brokers of more than the famous 57 varieties have sprung up, whose investment consists mainly of desk room or an office, and who use the carriers' cars for warehouses and display rooms, as they have none of their own, peddle cars from one place to another, or sell and resell to others. It is this class of patrons who have put the kibosh, so to speak, on the whole works.

It can be readily understood, upon reflection, that these brokers cut into the carriers' profits, as the service is generally free. The regrettable feature, however, is the undeniable fact that patrons who do not avail themselves of, or abuse the privilege, must stand a certain portion of the expenses incurred by the other fellow, and far worse is the fact that other shippers are denied cars to load, caused by the cars being tied up under load, and train service and yard work is handicapped, which causes a large loss to every one concerned; to repeat, the good patron is the sufferer.

From the standpoint of the consumer, he is the ultimate loser, as eventually the man or company who eats or uses the commodity peddled from one place to another—each one taking a part in the transaction making a profit—foots the bill, therefore, as usual, the public pays for a service which actually could, to a very large extent, be done away with or at least curtailed. It is not an uncommon practice for shipments to change hands from four to eight times before being actually sold and distributed.

In report of the Interstate Commerce Commission No. 3289, Detroit Traffic Association vs. Lake Shore & Michigan Southern, the remarks of commissioner on diversion privileges are in part as follows:

"There is an ever-present temptation before the shipper, however, to convert the reconsignment privilege into a means of indefinite storage. So long as the demurrage fees are paid, the consignee regards it as his right to delay reconsignment as long as he pleases. The privileges of reconsignment properly carry no such right. Not a little consideration has been given to the question of unnecessary detention and its relation to the shortage of cars that work such a hardship upon the shipping community generally."

The above goes to show the commission is alive to the fact that many parties simply use reconsignment privileges to the disadvantage of the general shipping public.

The railroads, so far, have failed to convince the Interstate Commerce Commission, because of their failure to agree on any definite plan, or to show whether diversions are a good or a bad thing. Before action can be taken to bring this matter to a successful conclusion, the railroads must

get together, decide on one thing and back it up with actual figures.

Under present diversion and reconsignment rules in California an unlimited number of diversions are permitted and no diversion charge is made on fresh fruits, fresh vegetables (including potatoes and onions) live stock and whole grain or seed. These are the very commodities, particularly potatoes, onions and grain, on which the diversion privileges are so very greatly abused. It is our understanding that tariffs of eastern lines are about the same, some commodities exempt from diversion charge and generally no limit on the number of diversions.

To enlighten others and awaken those who are champions of reconsignment and diversion privileges to delay and cost of same, I have compiled exhibits which were used in a recent case decided in favor of the carrier. In compiling figures in these exhibits, we used agents' regular reports, and drew off detained movement of each car involved; therefore, the figures are authentic. Costs are all taken from actual statistics compiled, and while estimation may be a trifle far-fetched, they can be relied upon as being correct at the time they were compiled. Exhibits are for a period of one month, October, 1915, with recapitulation for the same month, October, 1916, for comparison. Detention all accrued in the state of California on trans-continental lines.

Exhibit A shows cars of potatoes and onions, reconsigned or diverted by shippers, and cars and days held, also net demurrage. Note particularly abuse to equipment by shipper No. 1 in comparison with others. No. 1 handled 27.20 per cent of all cars; diverted 45.08 per cent; delayed 50.49 per cent, and demurrage paid was on 50 per cent of the total. The statement reflects how much more some shippers avail themselves of free service than others. The detention on potatoes and onions is far greater than any other commodity in California. Note that 1,636 cars were shipped; 721 were reconsigned or diverted and were delayed a total of 1,214 days, for which the carrier's only revenue was \$345 demurrage; also \$654 demurrage for delay in unloading, total \$999, for which the consumer eventually paid, in order to eat his daily rations of "spuds."

Exhibit B shows detention by various commodities, such as potatoes, onions, hay, straw, wheat, grain, vegetables, fruit, lumber, automobiles, oils and gasoline; total 4,011 cars delayed 4948 days, with only \$1,123 demurrage, or 28 cents per car, 23 cents per day, or hardly enough to pay for grease on the journals.

Exhibit C shows detention by various commodities, exclusive of potatoes and onions, on cars held on "hold tracks" at destination for further orders. Total cars held 3103, for 3954 days, with only \$606 demurrage, or 19 cents per car, 15 cents per day, or about pay for telephone service.

Exhibit D shows same as above, except that totals for delay at terminals of San Francisco and Los Angeles are shown, which indicates that only about 50 per cent of the delay occurred at large cities.

Exhibit E shows grand recapitulation of delay to all cars held for reconsignment, diversions, and others to move from hold track; the total reaching the amazing figure—for one month—of 7114 cars delayed 8902 days, with \$1,729 demurrage, or 24 cents per car, 19 cents per day.

Exhibit F is the same as Exhibit E, except that it is for October, 1916. Total 6387 cars delayed 8741 days, with \$2,388 demurrage, or 36 cents per car, 27 cents per day; note increase caused by introduction of new system of records.

Exhibit G shows routing necessary in handling "a case of slowed up movement": Letters 3, wires 7, telephone 1; total, 11 communications. This exhibit can be taken as an average example of work performed by carriers in carrying out wishes of patrons to avoid demurrage at final destination.

Exhibit H—Shows how cars are slowed up in transit to

accommodate patrons, and service and delay caused thereby; To-wit, for two months, 80 cars, 236 telegrams sent; average, 8 per car; total communications, over 10 per car; average delay per car, 12 days. For period of two months, 96 cars potatoes, diverted 225 times; average 2 1-3 times per car; total messages, 376; average 4 per cent; average delay per car, 14 days. Shippers admitted they held up cars to avoid "breaking the market."

Exhibit I covers four trans-continental lines and one private car line, in the comparatively short period of three weeks; number of cars diverted, 193; number of times diverted, 451; number of diversion messages, 962; cost at Western Union rates, \$957.97; average, \$4.96 per car; average number of messages per car, 5; average diversion per car, 2.34.

Exhibit J shows total of 64,678 cars diverted in one year; 61,956, or 95.79 per cent free of cost, and only 2,722, or 04.21 per cent were charged for; 2,059 cars were diverted two to five times, and 26,714 messages were necessary to complete transaction. Had a charge of \$2 been made on "free cars" the carriers would have collected \$123,912.

In the foregoing exhibits no segregation was made between state and interstate traffic, but the latter composed about 85 per cent of the whole. To illustrate the cost to the railroads of these privileges, I would cite the following:

If commercial wires were used, for example, in October, 1915, on 4,011 cars held for diversion at an average cost of \$4.96 per car, it would amount to \$19,894.56.

There are only a comparatively few paid diversions, but assuming all of these 4,011 cars would have been subject to a diversion charge of \$2, the sum of \$8,022 would have been collected.

A charge is made of \$2.50 for ordinary switching of a car, and as a diversion entails two switchings and considerable extra switching in picking up cars after forwarding instructions are received, we think it only fair to show extra switching of these 4,011 cars on a basis of \$2.50 for setting out and \$2.50 for picking up each car again, or a total of \$5 per car, which amounts to \$20,055.

Since the average earnings of a car per day on our last analysis in this territory was \$5.68 for all cars in commercial service, loss of 4,968 car days is equivalent to \$28,104.64.

The grand total of figures shown above is \$76,076.20 for the month of October, 1915—only one month. If the same ratio would hold good for the entire year, the figures would reach the amazing total of \$912,914.

We have not included in these figures the operating expenses caused by shipments being back-hauled. To illustrate, we had a short time ago 15 cars for one firm in a period of 20 days, that were backhauled 11,250 miles, for which the carrier received no additional revenue.

In view of the foregoing and of the fact that the number of reconsignments and diversions are only a fraction of the total in the United States, the cost of this extra and, nearly always, free service is so alarming, that if figures were available drastic action would be taken immediately to stop up these leaks and loopholes, which now permit a Chinaman with a load of wash to pass through without even touching the sides.

Assuming that it is necessary to clean house and make this service (which is no longer an infant and has become of age) to stand its own cost and cut out this large contributor to car shortages, congestion of terminals, delay to cars, burden in use of wires, clerical labor, etc., the question is—how is it to be done?

First: Statistics must be obtained showing conditions over a period of time to substantiate the fact that curtailment is vital and necessary, otherwise the commissions will not sit up and take notice. Data should be compiled along lines shown in the exhibits appended hereto, or in better fashion, also a record should be kept of messages, tracers, time and cost in handling, cost of extra switching, delay to trains,

cars, damage and claims paid through errors, and in brief all expenses of any sort incurred by any department, substantiated by detailed records, as far as possible, together with an estimate of delay and damage caused to other patrons.

Second: The railroads must decide and agree among themselves, using the data obtained as basis, that diversion

ten years' experience, eleven years of which covered watching of operations on many railroads daily, and while they may not be precisely what the railroads want, and I have not taken space or time to substantiate them, I believe they will at least be food for thought and later action. It should be borne in mind that while figures for charges may seem

EXHIBIT "A"

STATEMENT OF CARS, BY SHIPPERS, SHOWING ALL CARS OF POTATOES AND ONIONS DIVERTED OR RECONSIGNEED ON THREE TRANS-CONTINENTAL LINES IN CALIFORNIA DURING MONTH OF OCTOBER, 1915.

Shipper	No.	Total cars handled	Cars diverted					Total	Total diversions	Cars delayed				Total cars delayed	Total demurrage charged	Demurrage on cars held for diversion
			Once	Twice	3 times	4 and over	1 day			2 days	3 days	4 and over				
No. 1	445	177	122	20	6	325	506	155	104	28	34	613	\$327	\$171		
No. 2	157	88	14	9	1	112	147	83	11	12	4	158	33	15		
No. 3	93	29	3	0	0	32	35	25	5	1	0	38	3	3		
No. 4	91	22	0	0	0	24	26	12	5	2	43	26	48	36		
No. 5	69	21	6	1	0	28	36	17	5	4	2	47	24	12		
No. 6	60	4	2	0	0	6	8	2	1	1	2	16	6	6		
No. 7	59	0	0	0	0	0	0	0	0	0	0	0	0	0		
No. 8	58	31	7	0	0	28	35	11	10	1	1	39	9	6		
No. 9	43	18	3	3	0	24	33	13	7	1	2	39	6	6		
No. 10	38	10	0	0	0	10	10	6	4	0	0	14	0	0		
No. 11	32	12	1	0	0	13	14	9	2	0	0	13	3	3		
No. 12	24	8	0	0	0	8	8	8	1	0	0	6	6	0		
No. 13	23	0	0	0	0	0	0	0	0	0	0	0	0	0		
No. 14	16	6	0	0	0	6	6	6	0	0	0	6	3	3		
No. 15	15	0	0	0	0	0	0	0	0	0	0	0	0	0		
No. 16	15	2	0	0	0	2	2	1	0	0	0	3	0	0		
No. 17	15	2	2	1	1	11	18	6	1	2	2	24	9	6		
No. 18	14	2	0	0	0	2	2	0	1	0	0	2	0	0		
No. 19	14	14	0	0	0	14	14	9	2	1	2	25	21	21		
No. 20	13	11	0	0	0	11	11	6	4	0	0	10	0	0		
No. 21	13	0	0	0	0	0	0	0	0	0	0	0	0	0		
No. 22	10	5	0	0	0	5	5	5	0	0	0	5	0	0		
No. 23	10	0	0	0	0	0	0	0	0	0	0	0	0	0		
No. 24	9	3	0	0	0	3	3	3	0	0	0	3	0	0		
No. 25	7	0	0	0	0	0	0	0	0	0	0	0	0	0		
No. 26	7	2	1	0	0	3	4	3	0	0	1	7	12	3		
No. 27	6	5	0	0	0	5	5	3	0	0	2	11	3	3		
No. 28	5	0	0	0	0	0	0	0	0	0	0	0	0	0		
No. 29	5	3	0	0	0	3	3	0	0	1	3	19	42	33		
Various others	270	41	4	1	0	46	52	32	9	4	0	62	84	18		
Totals		1,636	511	167	35	8	721	983	409	179	58	57	1,214	\$654	\$345	

and reconsignment and reshipment, stop in transit and hold track detention, shall be restricted or done away with.

Third: It would be my suggestion to cut out all free reconsignments, stop in transits, reshipments, when bulk is not broken, and make a charge of no less than \$2 for each.

Fourth: If orders were not received in ample time to allow continuous movement of car to assess charge of at least \$2.50 for setting car out and \$2.50 to pick it up again. If a backhaul is involved, the shipper should pay the local rate.

Fifth: On cars ordered to hold tracks at destination for further orders, \$1 should be charged for overhead cost and \$2.50 for switching to and from hold track, or total of \$3.50 per car.

Sixth: Tariff provisions should be so worded to prohibit an out of line haul without proper freight revenue for the service.

Seventh: Tariff should be so constructed that the notice of arrival at point of stoppage or destination will constitute the notification, and free time under demurrage rules should be computed from the first 7 a. m. after the notice has been sent, in the manner previously agreed to by the shipper, and not from the time received through some distant railroad representative.

Eighth: Tariffs should provide that cars will not be considered released until forwarding instructions are actually received by the local agent holding the car for disposition and not from time filed with distant railroad representative.

Ninth: A committee of three or five well informed and efficient railroad men, who have full knowledge of the subject, should be found so that if the matter is presented to the Interstate Commerce Commission, this committee could act for all railroads.

Tenth: The aid of American Railroad Association and Commission of Car Service, should be obtained to assist in the movement.

These provisions, I believe, are necessary, from my nine-

excessive, it is not the purpose to obtain additional revenue, but to curb the practice and to make those enjoying the privilege pay its proper cost, taking everything into consideration, I venture to say the figures are not far astray.

EXHIBIT "B"

STATEMENT OF CARS, BY COMMODITIES, SHOWING ALL CARS OF VARIOUS COMMODITIES DIVERTED OR RECONSIGNEED DURING MONTH OF OCTOBER, 1915, ON THREE TRANS-CONTINENTAL LINES IN CALIFORNIA

	Once	Twice	Total Diversions	1 day	2 days	3 days	4 days and over	Total days held	Total cars held for R/C
Spuds and onions	511	210	721	983	409	179	58	57	1,214
Hay and straw	463	7	470	480	431	35	12	2	546
Wheat and grain	464	54	518	582	356	74	37	18	687
Vegets. and fruit	706	0	706	706	638	37	9	12	793
Lumber	130	0	130	130	127	2	0	1	135
Automobiles	49	0	49	49	41	5	1	2	62
Oil and gasolene	127	0	127	127	112	4	8	3	150
Various others	1,290	0	1,290	1,247	29	7	7	1	3,361
Total	3,740	271	4,011	4,347	3,361	365	132	102	4,948

EXHIBIT "C"

STATEMENT OF ALL CARS, BY COMMODITIES, HELD ON HOLD TRACKS AT DESTINATION FOR FURTHER DISPOSITION DURING MONTH OF OCTOBER, 1915, ON TRANS-CONTINENTAL LINES IN CALIFORNIA

	Total cars held	1 day	2 days	3 days	4 days and over	Total on days held for orders	Demurrage
Wheat and grain	832	647	150	28	7	1,062	\$93
Hay and straw	229	191	23	2	13	324	123
Autos	56	47	4	0	5	80	24
Lumber	255	252	1	0	1	260	12
Oil and gasolene	181	180	0	0	1	184	12
Vegetables and fruit	275	222	34	6	13	378	87
Various others	1,175	1,114	82	36	43	1,666	255
Grand total	3,103	2,653	295	72	83	3,954	\$606

EXHIBIT "D"

FOR TERMINALS OF SAN FRANCISCO AND LOS ANGELES, CAL.

	Total	1 day	2 days	3 days	4 days and over	Total on days held for orders	Demurrage
San Francisco	568	392	84	32	60	1,027	\$291
Los Angeles	871	779	68	8	16	1,035	210
Total	1,439	1,171	152	40	76	2,062	\$501
Total all other stations	1,664	1,482	143	32	7	1,892	105
Grand total	3,103	2,653	295	72	83	3,954	\$606

EXHIBIT "E"

Diversions or re-con-						
signments	3,361	365	132	102	4,948	\$1,123
Hold track	3,103	2,653	295	72	83	3,954 606
Grand total	7,114	6,014	660	204	185	8,902 \$1,729

EXHIBIT "F"

GRAND RECAPITULATION OF ALL CARS DIVERTED OR RECONSIGNEED AND HOLD TRACK DETENTION FOR MONTH OF OCTOBER, 1916

Diversions or recon-						
signments	3,052	2,462	353	94	73	3,852 \$1,320
Hold tracks	3,335	2,715	270	149	201	4,889 1,068
Grand total	6,387	5,177	623	243	274	8,741 \$2,388

EXHIBIT "G"

The following is a sample of many cases discovered in investigations, showing routine necessary to accomplish diversion:

September 15—Letter from consignee at Los Angeles to diversion clerk, Los Angeles, on car consigned to Los Angeles. "Confirming 'phone advice—Stop U. P.-73,732 at Pomond."

September 15—Wire, diversion clerk to agent San Bernardino (division point). "Stop U. P.-73,732, forward to Pomona and advise."

September 15—Wire, diversion clerk to Agent Pomona. "Advise arrival of U. P.-73,732."

September 17—Wire, agent San Bernardino to diversion clerk. "U. P.-73,732 stopped and forwarded to Pomona."

September 17—Wire, agent Pomona to diversion clerk. "U. P.-73,732 has arrived."

September 18—Wire, agent Pomona to diversion clerk. "Give disposition of U. P.-73,732."

September 20—Letter of diversion clerk to consignee, confirming 'phone request. "U. P.-73,732 at Pomona, please give disposition."

September 20—Letter from consignee to diversion clerk confirming 'phone advice. "Divert U. P.-73,732 Pomona to Los Angeles."

September 19—Wire diversion clerk to agent, Pomona. "Forward U. P.-73,732 to Los Angeles."

September 19—Wire, agent Pomona to diversion clerk. "U. P.-73,732 will go forward to Los Angeles."

'Phone advice was usually acted upon, the letters being in confirmation.

EXHIBIT "H"

TWO EXAMPLES OF FLAGRANT ABUSE OF RECONSIGNMENT AND DIVERSION PRIVILEGES

During two months there were stopped at San Bernardino by the East & West Railroad 30 cars consigned to Los Angeles, diverted to intermediate points, and finally to Los Angeles, which required the use of 236 telegrams, or an average of 8 per car. Including telegrams, there were 321 communications, or over 10 per car. Twenty-six of these cars were delayed between San Bernardino and Los Angeles (a distance of 60 miles, with a train schedule of less than 6 hours) on an average of 6 days; the average delay between arrival at San Bernardino and release at Los Angeles was 12 days per car.

North & South Railroad diversion files from January 15 to February 28, show 96 cars of potatoes originating at California, diverted 225 times, an average of 2 1-3 times per car, total number of messages 376, or an average of 4 per car. All but four of these cars were finally unloaded at points in Southern California and were in transit on an average of 14 days.

The consignee frankly admitted that his object in stopping cars was to avoid "breaking the market" and to evade demurrage which would have probably accrued at the final destination had they been allowed to go through on schedule time.

EXHIBIT "I"

STATEMENT SHOWING ABUSE OF FREE DIVERSION PRIVILEGES AND WHAT THE COST WOULD BE HAD MESSAGES BEEN SENT BY WESTERN UNION INSTEAD OF RAILROAD WIRES

Road	No. cars diverted	No. diversion messages times diverted	Cost at Western Union rates	Average cost per car at W. U. rates	Average No. of messages per car	Average No. of diversion per car
Ex. Co.	17	43	\$213.71	\$12.57	9.47	2.53
A. L. W. R. R.	24	68	230	199.58	8.32	9.58
N. & S. R. R.	100	245	170	152.36	1.32	1.70
E. & W. R. R.	31	65	220	174.18	5.62	7.10
S. & E. Ry.	21	30	181	218.16	10.39	8.62
	193	451	962	\$957.97	\$4.96	5.00

*The average is low, because the same message was used to divert more than one car.

The above is a recapitulation of diversions by the four roads and one car line mentioned, and includes some of the most aggravated cases of abuse of the free diversion and free wire privileges, although it covers a comparatively short period. These cover diversion orders filed with offices in California alone, as we are unable at this time to secure information of the same character filed with offices in other states.

Assuming that the North & South Railroad is a fair example of the number of messages per car in accomplishing diversion and that the minimum Western Union rate of 25 cents per message had been imposed, this would represent the respectable sum of \$24,254.

EXHIBIT "J"

FREE AND PAID DIVERSIONS AND RECONSIGNMENTS—FOR ONE YEAR

Road	No. of cars diverted	Free diversions	Paid diversions	Remarks
N. W. R. R.	20,640	19,488	1,152	
Ex. Co.	20,475	20,475	None	2,059 cars diverted 2 to 5 times.
N. & S. R. R.	18,140	17,624	516	26,714 wires sent.
E. & W. R. R.	3,457	3,003	454	
S. E. Ry.	1,966	1,366	600	
Total	64,678	61,956	2,722	

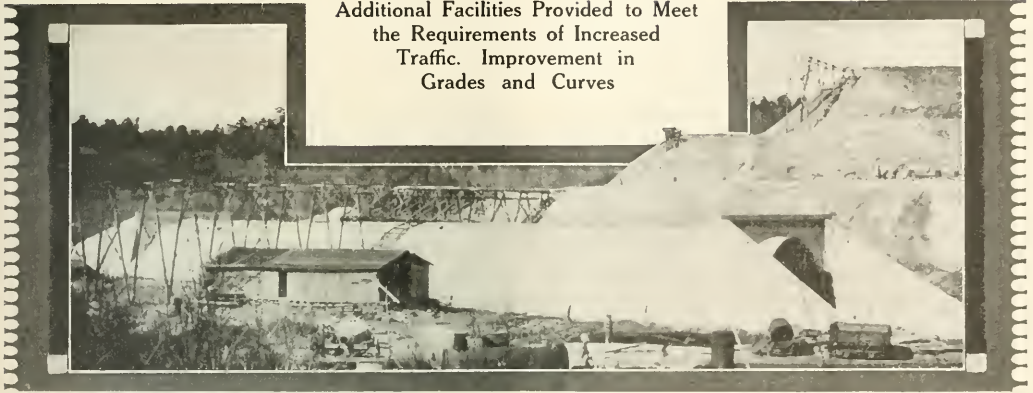
Note.—Of the total number of cars diverted—64,678—there were 61,956, or 95.79 per cent, diverted free of cost, and but 2,722, or 4.21 per cent, on which a charge of \$2 per car was imposed.

Had a charge of \$2 been imposed on each car the total would have been \$129,356 instead of \$5,444, or an increase of \$123,912 for the year.

GERMANY ENCOURAGES WATERWAY TRAFFIC.—From August 1 a new railway charge has been introduced in Germany, apparently as a means of raking in more money—a charge of an additional 7 per cent on the cost of transporting all freight sent by rail, whether for long or short distances. This 7 per cent must be paid by the shipper. More interesting is the fact that from July 1 last it was made compulsory to send certain categories of freight in Germany by water, whenever possible. (Germany has 9,375 miles of navigable inland waterways.) Everything is being done besides to encourage the sending of freight by water, the newly introduced taxes on freight traffic having been removed, within certain limits, in the case of freight which is sent by water, but which it is not compulsory to send by this means. Certain classes of freight may in any case no longer be sent by rail from particular places on the Elbe, Oder and other rivers, but only by water, by a regular service of cargo steamers, running between Altona and a number of other places, including Berlin, and between Berlin and other places. Moreover, surtaxes have been introduced on passenger tickets, amounting on a first-class ticket to 16 per cent, on a second-class ticket to 14 per cent, on a third-class ticket to 12 per cent and on a fourth-class ticket to 10 per cent, with an extra charge for baggage of 12 per cent on the ordinary cost of its conveyance. From this it may be inferred that the financial condition of German railways cannot be altogether brilliant.—A correspondent in the *Railway Gazette*, London.

Second Track Construction on Southern Railway

Additional Facilities Provided to Meet the Requirements of Increased Traffic. Improvement in Grades and Curves



Trestle for 98 Ft. Fill Over 30 Ft. Arch at Walton Creek

DURING the last three years the Southern has undertaken the reconstruction of its main line and the construction of second track on 363 miles out of a total distance of 649 miles between Washington, D. C., and Atlanta, involving an expenditure of over \$20,000,000. It is the most extensive program of this character undertaken in this country during the last few years and when the work now under contract is completed the Southern will have a double track road built to modern standards between these two points. Located as the Southern main line is, high up along the water sheds in the broken and in some places almost moun-

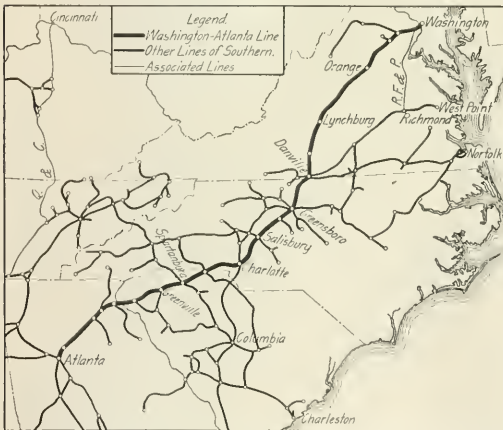
work and it has progressed rapidly since that date. Of the 649 miles, a second track has been built parallel to the original track on about 479 miles and a new double track line has been built in place of the old line on 170 miles. In the revised line the maximum curvature is 6 deg. and this has been used in only a few instances, the sharpest curve generally being less than 4 deg. The grades have been reduced from a maximum of 2 per cent to 1 per cent in both directions except at those points where momentum or pusher grades have been installed. This revision of the grade line has enabled the rating for Mikado engines to be increased from 1,400 tons to 2,000 tons. The improvements have also included the rebuilding and enlargement of division terminals and the elimination of grade crossings where this has been physically practicable. On the new lines already completed nearly 100 crossings have been eliminated, involving a very heavy total expenditure. The removal of these crossings will be described in detail in a second article.

The construction of the second track has been carried on in sections, the most congested portions of the line being improved first and leaving single track districts between. The work has now progressed to the point where the double track line is in operation for the entire distance of 382 miles between Washington, D. C., and Charlotte, N. C., the 53 miles between Spartanburg, S. C., and Central, S. C., and the 78 miles between Cornelia, Ga., and Atlanta. Work was begun on the 61-mile section between Central, S. C., and Cornelia, Ga., in April, 1916, and on the 75 miles between Charlotte, N. C., and Spartanburg in April, 1917. With the completion of these two sections the entire main line between Atlanta and Washington will be double track.

THE DEVELOPMENT OF TRAFFIC

These improvements were made necessary by the rapid development of the territory served by the Southern and the consequent great increase in the volume of traffic handled. In the period between 1900 and 1916 the population of the states served by the railroad increased 23 per cent. In the same period the passenger revenue per mile of road increased over 83 per cent. In 1900, with 6,425 miles of road operated, the number of passengers carried one mile was 370,424,293, while in 1916, with 7,023 miles of road operated, the number had increased to 783,139,707.

The industrial development of the states traversed by the Southern lines is evinced by the figures compiled by



The Washington-Atlanta Line in Relation to the Southern System

tainous areas parallel with the Atlantic seaboard, the original line was one of heavy curvature and grades, 2 per cent grades being common. While the rapidly increasing traffic made the improvement of this line imperative, these physical characteristics made the work unusually expensive.

The construction of second track on this line was first undertaken over 15 years ago, but from 1901 to 1914 only small sections were rebuilt each year. In June, 1914, funds were made available for the more rapid prosecution of the

the United States census of 1914 which show that in the five years covered by the census the value of the manufactured products had increased 18.44 per cent as compared with 17.20 per cent for all other states. The census figures also show that in the 12 months ending July 31, 1916, the mills of the South consumed 3,526,787 bales of cotton, an increase of 16.51 per cent compared with an increase of 11.62 per cent for all other states. Approximately 75 per cent of the cotton spindles of the South are in mills along the lines of the Southern and its associated companies. In the territory served by this road during the year ending June 30, 1916, general improvements, public utilities, etc., were completed at a cost of more than \$67,500,000. Industrial plants numbering 684 and representing a capital investment of more than \$35,000,000 were completed during the same period and additions were made to 320 plants previously established at a cost of nearly \$17,000,000, while construction was begun on 80 other plants representing a capitalization of \$16,327,700.

The principal feature of the agricultural development aside from the production of cotton and tobacco is the rapidity with which the southern farmers are adopting diversified farming and crop rotation with the raising of live stock, which results in increased average yields per acre of the staple crops. The fruit industry is also developing rapidly and in the year ending June 30, 1916, nearly 3,000,000 apple, peach, orange and other fruit trees were planted along the lines of this railway. The result of this general, industrial and agricultural development is reflected in the gain in revenue freight handled which increased from 14,121,181 tons in 1900 to 30,272,130 in 1916.

During the year ending January 30, 1916, 30,272,132

By referring to the map of the system it will be seen that lines radiate from the main line between Washington, D. C., and Atlanta, Ga., and that this main line is the outlet for the traffic from these branch line feeders. At Atlanta lines from Florida and from Arkansas, Mississippi and Alabama converge. At Charlotte the line diverges for Florida. The line from Chattanooga and Tennessee points



Steam Shovels Working in New Glasgow Cut

joins the main line at Salisbury, N. C.; while one line from Norfolk, Va., connects at Greensboro, N. C., and others at Danville, Va. In addition to these main feeders others tap the main stem both north and south of Charlotte. This frequent junction with branch lines places a heavy burden on certain sections of the main line and results in congested



Alinement and Profile of Old and New Lines from Harbin, S. C., to Cornelia, Ga.

tons of commercial freight was moved, of which 29.43 per cent was the product of manufacturers and miscellaneous, 28.6 per cent bituminous coal, 12.1 per cent other products of mines, 16.19 per cent products of forests, 11.86 per cent products of agriculture and 1.11 per cent products of animals. A large amount of this traffic is in high grade commodities which demand fast movement. During the fruit season this demand is particularly imperative. The fruit trains are often run as sections of passenger trains, 15 sections of a train not being uncommon. With single track the expeditious movement of this high grade freight, most of which is northbound, was difficult and at times it interfered seriously with the movement of other freight and of passenger trains. During the period of greatest traffic density it has been necessary to discontinue the operation of all work trains.

districts. With single track these districts limited the capacity of the entire system as all traffic between the east and west and from the north or the south, had to pass over one or more of them. As a result, not only was the operation slowed up and the cost increased in the congested districts, but the development of the entire system was retarded. The justification of the improvement work is shown by the fact that during the year ending June 30, 1916, the entire 649 miles of line earned well over \$25,000 a mile revenue.

FINANCES

At the inception of the project in 1901 the road was handicapped by the lack of funds, and for this and other reasons the double tracking done between 1901 and 1914 was in comparatively short sections, the extent of the yearly work depending on the funds available. During this period

of 13 years, 240 miles of the 382 miles between Washington, D. C., and Charlotte, N. C., and 78 miles north of Atlanta, Ga., were improved. In October, 1914, funds were made available for the remaining work which has since progressed rapidly. At that time an agreement between the Southern

boro. In subsequent years the other sections were built in the order of their importance. South of Charlotte the earliest improvements were made north of the Atlanta terminal district, through which the main line handles a large amount of traffic for the Birmingham district, Mobile, New Orleans and other more distant points.

PLAN OF CONSTRUCTION

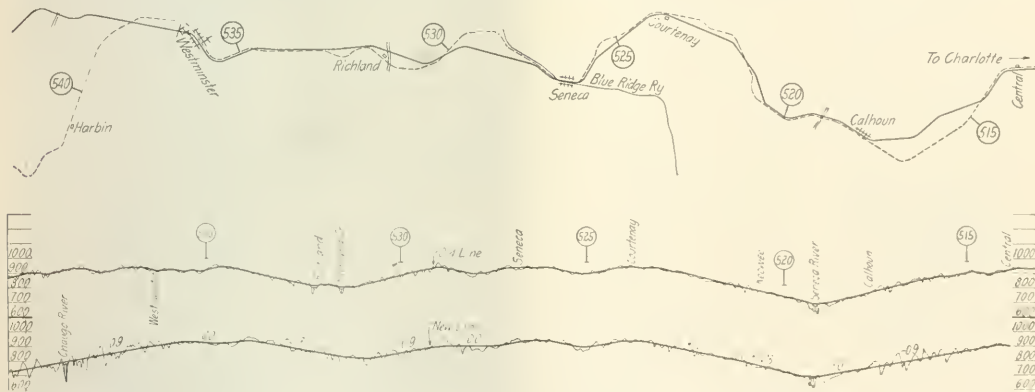
Where practical the second track has been built parallel to the old. However, in many cases the surveys disclosed the fact that a better line could be secured and in such sections a new double track line was built, the old location being then abandoned except at a few points. At places sections of the old main line were left in service as spurs for industrial development and at Lynchburg, Va., the old line is still used for local trains. In building replacement lines the engineers were confronted with the problem of locating an improved line and still reaching all the stations served by the old line. This object was accomplished in all cases except at Madison, Ga., where the citizens relieved the railroad from its obligation to maintain service for the sum of \$25,000.

In parallel work the second track was built first on one side of the old main line and then on the other to secure the minimum grading. In some instances it was located far enough from the old track to allow a new double track roadbed to be constructed independent of the old, and in other instances to allow the construction of only one track. In order to understand the construction methods followed in this parallel work it should be remembered that the grades were reduced through such sections the same as on independent lines, all summits being lowered and sags raised so



Coldazel Fill 40 Per Cent Complete

Railway Company and the Atlanta & Charlotte Air Line Railway Company, now a part of the Southern, was ratified authorizing the Atlanta & Charlotte to issue \$20,000,000 of bonds, secured by a first mortgage on all of its railroad property, \$5,500,000 of these bonds being issued to retire the bonded debt of the Atlanta & Charlotte and \$14,500,000 to provide funds for the double tracking of the railroad. These funds made it possible to undertake the double track construction work south of Charlotte in yearly sections much



Alinement and Profile of Old and New Lines from Central, S. C., to Harbin

more extensive than in the earlier work between Charlotte and Washington.

CONSTRUCTION PROGRAM

In carrying on the earlier construction work the first efforts were directed to the relief of those congested districts where the traffic was most dense. The main line north of Charlotte carried a particularly heavy burden, with the congestion becoming greater toward the Washington end. North of Orange, Va., the Southern handles the trains of the Chesapeake & Ohio in addition to its own traffic, and because of this fact the first section to be improved was the 78 miles of line between Orange, Va., and Alexandria. This part of the work was done between 1901 and 1903. During the three following years the work was continued in the congested district between Salisbury, N. C., and Greens-

boro. The old choppy grade line was replaced with longer continuous grades.

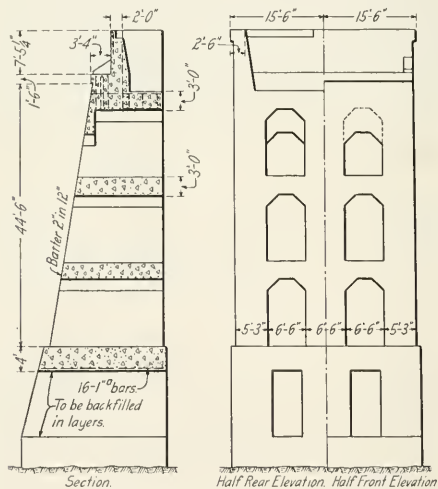
The work was done in two ways where the grade was changed. In one the double track line was built without disturbing the old. In the second, one new track was built at the new grade and traffic was diverted to it, the old track then being taken up and rebuilt in its proper location. Both methods possessed advantages, the first being more expensive in grading and the second in track work. The two methods are illustrated in the diagrams. Where feasible the first method was followed as this led to no delay to construction, both tracks being completed and opened to traffic without disturbing the old track which was taken up when convenient. Also by this method the old roadbed was not endangered by the almost vertical cut that it was necessary to make at the ends of the cross-ties of the old

main track if the second method is followed, at points where the new grade was lower than the old. When following the second method if the change in grade was not more than five feet the old main track was lowered or raised in its original location, while if the change in grade exceeded five feet the new track was built first. With this method, construction must be shut down after the grading for the first track is completed until the new track is laid and traffic diverted to it. The remainder of the roadbed is then built and the second track laid.

In such work the railroad does not allow the contractor to waste, or borrow earth at will, defacing the right of way. Where long light fills or cuts are encountered, where the work is not heavy enough for the employment of steam shovels and trains and the haul is too long for wheeler outfits, revolving shovels have been used in connection with dump wagons and teams. If it happens that it is necessary to waste the material, it is placed below sub-grade and the banks are trimmed to make a slightly appearance.

STANDARDS OF CONSTRUCTION

In both parallel and replacement line work the track is laid with 85-lb. rail by company forces. Tieplates are placed on all curves. The ties used are untreated and in most cases are produced along the right of way. Both



High Abutment of the Buried Type

gravel and broken stone are used for ballast. The standard slope in earth cuts is 1 to 1 and in fills $1\frac{1}{2}$ to 1. In making fills, instead of increasing the height the excess material is placed outside of the standard section which is 31 ft. for a double track roadbed. Ten per cent of the height of the fill, measured on the slope, is placed on each side. For instance, in a fill 100 ft. high the roadbed is made 61 ft. wide instead of the standard 31 ft. This extra width provides for a large amount of wash before the net section is affected. In all cuts a surface ditch is dug 10 ft. back of the top of the slope to prevent the water from washing down over the face of the cuts. This precaution is necessary because of the clayey material encountered. These ditches are turned back away from the track as the fill is approached to prevent the water from washing the toe of the slope. In cuts the standard roadbed width is 39 ft.

The settlement in the fills occurs almost invariably outside of the top of the slope and manifests itself as a vertical crack. The settlement is often as much as 10 to 12 ft., and

after it has subsided the fills are widened, it being necessary sometimes to repeat the operation. American ditchers are used in these operations.

As delivery of steel is so uncertain at present the standard overhead highway bridge on the later work is constructed entirely of creosoted timber except for the floor which is laid with 3-in. by 6-in. untreated heart pine planks. These bridges are built at an average cost of \$500 for labor and \$1,200 for material. The center span over the tracks is built as a truss 33 ft. in length, providing 10-ft. side clearances from the center of track instead of the old standard of 7 ft. 6 in. The roadway provided on the bridges is 20 ft. in the clear. In the earlier work the standard overhead bridge consisted of six $31\frac{1}{2}$ lb., 12-in. I-beams on the approaches and also on the middle spans, supported on 4-post creosoted wooden bents standing on concrete pedestals.

The steel railroad bridges are all designed in accordance



View of the Construction Plant, North Broad River Viaduct

with Cooper's E-55 loading and creosoted ties are provided in the deck. The bridge ties are fitted with 4-hole tie plates and the rails and plates are held in place by screw spikes.

As soon as possible after a section of double track is completed automatic signals are installed and passing tracks provided. The passing sidings are all 4,000 ft. long in the clear and in the replacement lines are located on the down grade slopes of summits in the direction of traffic. Approaching passing tracks on ruling grades, the grade is flattened to a maximum grade of 0.75 per cent for a distance of about one-half mile before reaching the switch. This arrangement permits the trains to stop on the main line, while the switch is being thrown and then to get in motion readily to

enter the siding. As the sidings are located on the down grade slope no trouble is experienced in leaving.

In parallel work the sidings are located in this way wherever feasible. At times, however, they are located on level grades but in no case are they located so that a ruling grade is encountered when entering or leaving a siding.

THE WORK SOUTH OF CHARLOTTE

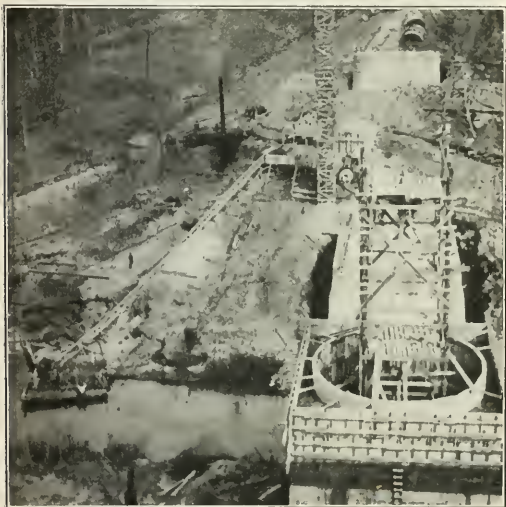
On the old line between Atlanta and Charlotte, grades as heavy as 2 per cent in spots were encountered with the average about 1.25 per cent. On the improved lines in the replacement work these grades have been reduced to 1 per cent against southbound and to 0.9 per cent against north-bound traffic. In the parallel work the same ruling grades have been maintained but momentum grades with as great a rise as 14 ft. vertically have been permitted at places.

Prior to the sale of the Atlanta & Charlotte bonds in 1914 second track had been provided on the 53 miles between Atlanta and Gainesville except for $4\frac{1}{2}$ miles between Suwanee and Duluth which has since been completed. The construction on this $4\frac{1}{2}$ miles was parallel except for a revision between Strickland Springs and Duluth, where 1,320

new line closely parallels the old, saving 70 ft. in distance, while the rise and fall and the curvature are unchanged. From Easley to Greenville, 12 miles, with the exception of a $4\frac{1}{2}$ -mile revision south of Greenville, this division was also built by the parallel method. The distance saved here by the new line is 795 ft., while 257 deg. 26 min. of curvature and 29 ft. of rise and fall were eliminated. From Greenville to Greer the new line parallels the old except for a revision north of Enoree river, and from Greer to Hayne the only revision is a grade change at Wellford, eliminating 10 ft. of rise and fall.

The line revisions between Central and Hayne were comparatively minor and the work of main interest was the construction of the larger bridges. In the division between Easley and Greenville the bridge over George's Creek consists of three 100-ft. deck girder spans supported on buried abutments and reinforced concrete piers and that over the Saluda river of four 25-ft. concrete arch spans on the north end and a steel viaduct 900 ft. 8 in. long. Both of these bridges are located on the $4\frac{1}{2}$ -mile revision south of Greenville and were consequently built without interference with or from the traffic of the old line.

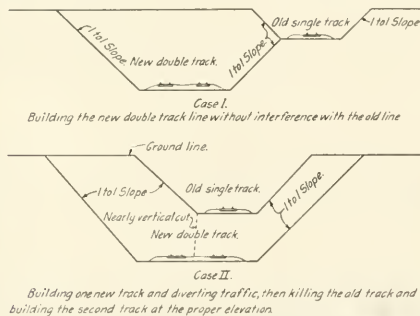
At Saluda river arch spans were provided to avoid a fill at a graveyard, and to permit an underpass for a country road. The viaduct, with its rails 110 ft. above the river, consists of a series of 60-ft. girders and 30-ft. towers which



Piers and Construction Plant at Chauga Creek

ft. of distance, 141 deg. 14 min. in curvature and 19 ft. of rise and fall were eliminated. Between Gainesville and Cornelia, 25 miles, the old line ran up and down hill with short tangents between curves. The new track was built first on one side and then on the other side of the old one to lengthen the tangents and to reduce the curvature. Between Baldwins and Gainesville the line was revised to do away with 6-deg. curves, to maintain the ruling grades and to eliminate a series of short humps in the grade line. In the earlier work, second track had also been provided for a distance of a little over one mile between Spartanburg, S. C., and Hayne, principally included in the Spartanburg yard. In this short section, however, no change was made in either line or grade.

Since the sale of bonds in 1914, the work in this territory has been prosecuted rapidly. The first section to be improved was the 57 miles between Central and Hayne on which work was begun in July, 1915. Construction of the second track in this section is now practically completed and the line is in operation as double track for nearly the entire distance. From Central to Easley, 14 miles, the



Methods of Providing Double Track

are supported on concrete pedestals. The south abutment is of the buried type. The supporting pedestals vary in design and, beginning at the north, the first is built as a reinforced concrete pier on which the girders rest directly. At the first tower the four supports originally were designed as square pedestals, but to save room at the highway which crosses under the viaduct at this point, the design of two of the pedestals was changed and circular reinforced concrete pedestals were provided. The plans provided for square pedestals in the stream but after the experience with the high water of July, 1916, the design of these was changed and buttress pedestals substituted.

The entire structure is founded on rock and the construction was carried on without trouble from water. This rock used in the concrete was quarried in a cut south of the bridge, crushed locally and hauled in wagons to the mixer plant. The sand was mined by hand from the creek and shoveled into wagons while cement was brought from the old line to the plant by wagons. The concrete was all placed from one mixing plant, distributed by an overhead cable way and placed in the forms at the north end from the tower and chute and at the pedestals by means of a derrick. At Enoree river, between Greenville and Greer, a single track deck truss, consisting of two 150-ft. spans with trestle approaches was replaced by four 90-ft. deck girder spans. At this point the second track was built parallel with the

old, a two-mile tangent preventing the building of the new bridge free of the old one without the addition of reverse curves to the line. The masonry for the new southbound track was built complete, with the new steel set 18 in. off center and traffic was diverted from the old structure to the new. The old structure was then removed and the masonry completed.

At the South Tiger river existing curves at either end of the old structure enabled the new one to be constructed free of the old. By reducing the length of the structure from 750 ft. to 540 ft., it was possible to place the new bridge entirely on tangent and to lessen the curvature slightly. The concrete for this structure was all placed from one tower. The stone for the work was brought in by train and the sand mined from the river by hand and hauled in wagons to the mixing plant.

At the Middle Tiger river the original structure was a steel viaduct with 30-ft. towers and 60-ft. girders. It was replaced by a deck girder bridge and the intermediate piers were constructed by boxing around the steel of the old structure. At North Tiger river and Fair Forest creek, similar construction methods were followed.

At Freyes creek a timber trestle was replaced by four 50-ft. deck girder spans. The new piers were arranged to come between the bents of the old structure and no temporary work was necessary to maintain traffic. All the masonry was brought up to the final height and the traffic then diverted over the new southbound main track where the first girders had been placed. The old structure was then torn down, the northbound girders set and the double track put in operation. The girders at this point were placed by derricks.

CORNELIA TO CENTRAL

The most interesting of all the work south of Charlotte is in the mountainous territory between Cornelia, Ga., and Central, S. C. Through this section, which is 61 miles in extent, the country traversed is badly broken and the line leads across a succession of ridges and valleys. The old



The Fill at Walton Creek

location followed around the hills instead of cutting through, necessitating excessive curvature and a very broken grade line. The old line did not lend itself to improvement by parallel construction without excessive cost, and except through villages and cities and other short stretches it was abandoned and a double track line was constructed in a new location that departs three to four miles from the old in places.

Owing to the nature of the country traversed and the fact that a practically new line was built the saving in dis-

tance, rise and fall and curvature were considerable; the new line being five miles shorter than the old, having 3,183 deg. 5 min. less curvature and saving 368 ft. in rise and fall. The maximum curvature is reduced from 6 deg. 14 min. to 4 deg. 30 min., and the maximum grade is cut from 2 per cent in both directions to 1 per cent southbound and 0.9 per cent northbound.

The grading in this section involved the moving of 10,351,200 cu. yd. of earth and rock for which 35 steam shovels were employed and the placing of 127,600 cu. yd. of concrete masonry. Near Ayersville, Ga., a cut 70 ft. deep and over one-half mile in length was excavated, from which



Dan River Bridge

290,000 cu. yd. of material was moved, 70 per cent of which was rock. South of Toccoa the largest fill on the entire line is encountered, 140 ft. high, 1,600 ft. long and containing 1,640,000 cu. yd. of material. At Waltons creek north of Toccoa another fill was made containing 750,000 cu. yd. of material.

The viaduct over the North Broad river which contains 35,000 cu. yd. of concrete is the most important bridge on this section of the line. Other important structures were provided at Tugallo river, Chauga creek, Seneca river, Richland creek, Walton creek and Toxaway creek.

In making the cuts containing rock the general practice was to drill the entire top width of the cut with a well drill, placing the holes from 8 to 10 ft. apart each way and shooting three or four rows of these holes across the entire width of the cut at one time. The shovels were then set at work, the loose materials loaded and removed and the operation repeated. To move the material at the bottom of the cuts steam drills were used and the holes were prepared and shot as above. Where boulders were encountered Jap drills were used ahead of the shovels to break up those that were too large for the shovels to load.

At Lane cut near Ayersville, Ga., where most of the 290,000 cu. yd. of material excavated was wasted, 200,000 cu. yd. within 200 ft. of the cut, the material in the three first cuts of the shovel was moved north and placed in a fill to avoid borrowing. At this point the new line crosses eight ft. above the old, and to move the material north it was necessary to provide a temporary bridge over the old track and an incline embankment down from the crossing to a connection with the old main track. A construction track was placed on this temporary embankment, and the material was moved to the fill in standard gage 6-yd. dump cars. After serving its purpose the temporary embankment was removed by the steam shovels.

South of Toccoa extensive side hill work was encountered and the new line was moved up the hill from its original

location to avoid a 2-ft. fill on the center line which ran to 150-ft. at the bank of the creek below. With the changed location the quantities balanced and in construction a path was cut along the grade line to permit the shovels to work.

The larger fills are built of borrowed materials and the lifts were made on temporary trestles built of poles cut along the line. The average lift is from 30 to 35 ft. At Coldazell fill the borrow pit was located on the north end. The material was moved from the pit by two Osgood No. 73 shovels and transported to the fills in standard gage 12-yd. Western air-dump cars. Two trains of 14 or 15 cars were provided for each shovel. The longest haul was 6,000 ft. and the average 3,000 ft.

At this point the fill crossed the old line 75 ft. above grade, and in order to maintain operation during construction the old main track was re-located up the hill about 100 ft. from its original location. This temporary location involved making a cut containing 50,000 cu. yd. of excavation. The new line was carried over the temporary location of the old main track on 100-ft. girders supported on pile abutments with trestle bents at each end. The embankment at this point was made in four lifts of 35 ft. each. The first trestle was placed diagonally across the site of the fill with the borrow pit on grade with the trestle. The diagonal location of the first trestle permitted the embankment to be made to the full bottom width to the limits of operation. The second and third trestles were also placed diagonally



North End of Saluda River Viaduct Showing Arches, the Solid Concrete Pier, and Square Circular and Buttressed Pedestals

with the center line but at a sharper skew to permit filling out to the toe of slope. As each trestle was built up to the proper height the borrow pit was moved up the hill to a corresponding elevation.

At North Broad river the approaches to the viaduct are on a 110-ft. fill and the embankment was placed from a trestle built to the full height. As the trestles were founded on rock, trouble was experienced in their moving with the creeping of the fill. This was overcome by first placing the fill at the ends and then building the trestle in the form of towers, providing just enough bracing between the towers to secure stability. The material was then dumped between the towers which effectually stopped the sliding.

The North Broad river viaduct which contains 35,000 cu. yd. of concrete, consists of eleven 100-ft. plate girder spans and eight spans of 26 ft., the total length being 1,313 ft. between back walls. It was planned originally to construct this viaduct with steel towers, but because of the high cost of bridge steel, hollow reinforced concrete piers 190 ft. high were built instead. These piers are rectangular in shape on the exterior and oval on the inside. The minimum thickness of the pier shell is 4 ft. and the walls in height are tied together with reinforced concrete slab struts at intervals of 30 ft. The footings are 51 ft. 8 in. by 47 ft. 8 in. in area and the piers at the bottom are 48 ft. 8 in. by 44 ft. 8 in., the dimensions diminishing to 34 ft. by 30 ft. at the coping line. In all cases the greater dimensions

are longitudinal with the bridge. Bridge seats for the 26-ft. girders are provided on the top of the piers.

The construction plant for the structure included a stone crusher located at the south abutment. The stone for the crusher was secured at a quarry 1,000 ft. south and it was transported to the crusher over a narrow gage track. A narrow gage double track was also provided between the crusher and the storage bin for stone, which was located above the mixer, the latter being placed on the low ground adjacent to the river. The cars loaded with stone passed down the incline from the mixer to the storage bin on one track and drew the empties up the incline on the other. The narrow gage track continued down the hill to a connection with a siding from the old main line, one mile distant. Sand and cement for the structure were brought in to this siding by trains and unloaded into the narrow gage equipment for transportation to the mixer plant. The construction plant also included an overhead cable way which supported the chutes from the distributing towers, which were built up in the center of the hollow piers, three piers being built from one tower. The concrete materials dropped by gravity from the storage bins into the mixer; from the mixer the concrete was emptied into 1-yd. buckets which were elevated in a tower provided for that purpose. The concrete was dumped from the buckets to a receiving hopper located in the top of this second tower and passed down chutes through an opening left in the shell of the pier in which the distributing tower was located. Here the concrete was again elevated and distributed to the forms through chutes.

The forms were built in the shape of a rectangle outside and oval inside from timber cut and sawed on the site. They were built in 6-ft. sections 12 ft. long except those at the center of the four sides of the pier which were built in lengths to conform to the batter of the pier faces. Enough forms were built for two sections entirely around the pier which were placed at the same time before beginning construction. The bottom section was filled and allowed to set. While the second section was being poured the bottom forms were removed and elevated into position for the third run. A stiff-leg derrick was utilized in this operation to the limits of its reach after which the cableway was employed. The forms needed no bracing except for tie rods between the inside and outside sections. The rods were placed inside paper tubes and were removed after the concrete had set.

The bridge over the Tugaloo river on the state line between Georgia and South Carolina consists of five 100-ft. girders supported on four solid concrete piers and reinforced concrete abutments, all founded on solid rock which was found 20 ft. below the water. The foundation excavation was made by a derrick and orange peel bucket and wooden cofferdams were provided. The concrete plant was located on the south bank of the river and a trestle carrying a narrow-gage track was provided for the entire length of the work. Stone for the concrete was secured from a quarry two miles down the river and was transported to the site by gasoline-driven barges. Sand was mined from the river by hand and a clamshell derrick and a derrick at the elevated mixer plant placed the concrete materials in gravity bins above the mixer. The concrete from the mixer was poured into buckets mounted on cars running on the dinky track and an endless cable run from a hoisting engine pulled the cars to position for the dumping, when the buckets were picked up by a derrick and emptied into the forms.

At Chauga river the masonry consisted of two buried abutments, one solid concrete pier at each end and two hollow piers. A tower at each end of the work, carrying a cableway, was provided here and the mixing plant was located south of the north pier. An elevator and spout at the plant distributed the concrete to this pier and the adjacent one. The abutments and other piers were poured from buckets mounted on trucks which were run under the mixer and filled

and then picked up by the cableway for transportation to the forms.

At Waltons creek fill a single barrel reinforced concrete arch of 30 ft. span was placed and a 40-ft. arch at Richland creek. Other important bridges were built at Seneca river and at Coneross creek.

NORTH OF CHARLOTTE

On the unimproved line between Charlotte, N. C., and Washington, D. C., the maximum curvature originally was 11 deg. 30 min. and the ruling grade in both directions was 1.5 per cent. In addition to the curvature and rise and fall eliminated on the new line the maximum curvature has been reduced to 6 deg. The ruling grade in both directions is 1 per cent except where an allowance has been made for momentum where in some cases 1.4 per cent grades have been installed and for five pusher grades against southbound traffic which are all located north of Pelham, N. C., in a district of comparatively light southbound traffic, and two pusher grades against northbound traffic. With helper engines at these points the improved line permits a tonnage rating of 2,000 tons for Mikado engines as compared with 1,400 tons on the old line.

The later work in this territory, which is now all completed, included the 60 miles between Orange, Va., and New Glasgow, the 5 miles between Sycamore and Gretna and the 22 miles between Whittle and Danville. These sections were single track gauntlets between double track districts. On their completion all of the 382 miles of line between Charlotte and Washington was placed in operation as double track. In these sections the line lies east of the Blue Ridge mountains, with much of it between the mountains and the James river with tributaries of the latter crossing the railroad in deep valleys at frequent intervals. In consequence, the country involves heavy construction, the heaviest work being on those parts of the line which are closest to the mountains. From Arrowhead to Elma, 20 miles, the line is nearest to the Blue Ridge and the country is so broken that it was considered economy to construct and operate pusher grades in both directions rather than to undertake the expensive construction of a 1 per cent grade line. From Elma to New Glasgow the 1 per cent grade line was installed, involving very heavy construction in the New Glasgow cut which required excavation 100 ft. deep through rock, over 600,000 cu. yd. of material being moved from this cut. Embankments 80 ft. high were also built across the valleys on each side of the ridge through which the cut was made.

The material from the cut was almost equally divided between the two embankments. In moving the rock, which is granite, 60 per cent dynamite was used in 11-ft. holes placed 6 ft. center to center, 30 to 50 holes being shot at one time. The rock broke in large fragments which were shattered by means of charges placed in holes prepared with Jap drills. The rock was handled by a steam shovel at each end of the cut and was hauled to the embankments in standard gage equipment.

The most interesting of the recently completed structures in the line north of Charlotte is the Dan river bridge which is a reinforced concrete trestle 940 ft. long, consisting of thirty-six 26-ft. reinforced concrete slabs, 35 piers and two reinforced concrete counterfort abutments. The substructure is founded on rock 46 ft. below the base of rail and the piers are seated two feet in the rock. The abutments are also founded on rock but to avoid unnecessary excavation the footing slabs between the counterforts were built approximately at the level of the ground surface, the counterforts extending below the slabs into rock. The superstructure is bordered on each side by a 5-ft. walk supported on concrete brackets and protected by concrete parapets. The latter are ornamented with pilasters carried on the ends of the floor

brackets. The bridge involved 5,000 cu. yd. of excavation 14,900 cu. yd. of concrete and 1,600,000 lb. of reinforcing steel.

The grade line over the new bridge is 13.2 ft. higher than over the old, eliminating a 1.5 per cent approach to the Danville passenger station, located a short distance south of the bridge. This change of grade made necessary the relocation of the station. The old building was moved back about 200 ft. and a 7-track station provided. Stairways lead from the three platforms to a waiting room placed under the tracks adjacent to Craighead street which also passes under the tracks through a subway.

For a considerable portion of the distance between Danville and White Oak mountain the line follows Fall creek which it crosses six times, requiring a variety of structures. The first and second crossings each consist of two 80-ft. girder spans and the third one of one 80-ft. girder span with a 20-ft. concrete slab span at each end. The fourth is a concrete trestle of four 26-ft. slab spans while the fifth consists of two 80-ft. arches.

There are 34 culverts and three highway crossings on this section and, exclusive of the Dan river bridge, the structures on this section required 8,000 cu. yd. of wet excavation, 13,000 cu. yd. of dry excavation, 15,000 ft. of pine lumber and 26,450 cu. yd. of concrete. The old bridge over the Buffalo river consisted of a 106-ft. riveted deck truss with the rail level 70 ft. above the street. The second track is located west of and alongside the old line and is carried on two 50-ft. three-centered flat concrete arches. The old stone pier abutments were extended into the concrete abutments for the second track, requiring high counterfort wing walls on the west side. Most of the concrete was placed by means of a tower and chutes.

At the Tye river the old structure consisted of three 166-ft. skew pin-connected deck trusses supported on stone piers and skew T-abutments. The rail level is about 65 ft. above the bed of the stream. The new double track line is west of and parallel to the old one, on a grade 15 ft. higher and is carried on a steel viaduct having 30-ft. tower spans and 60-ft. intermediate spans. The abutments are of the buried type. The one on the north end is unusually high as it rests on foundations, but little higher than the bed of the stream. In the south end the abutment is set in a pocket in the natural rock high up on the hillside. The viaduct towers rest on concrete, tapered pedestals of circular cross section. The columns of the viaduct towers have horizontal bases and are tied together by horizontal bottom struts. This arrangement eliminates lateral stress to a large extent and permits the use of pedestals of relatively slender outline.

Besides the structures mentioned there is a long 30-ft. barrel arch at Oak Ridge requiring 5,000 cu. yd. of concrete. Two forks of the Ravanna river cross the line north and south of Profit, the north fork requiring a bridge consisting of four 75-ft. deck girder spans, while the south requires four 90-ft. deck girder spans. Blue Run is crossed by a concrete bridge consisting of two 30-ft. arches.

All of the construction work both north and south of Charlotte is in charge of W. H. Wells, chief engineer of construction, at Washington, D. C. R. O. Parsons, assistant engineer at Toccoa, Ga., is in charge of the work between Cornelia, Ga., and Central, S. C., and Felder Furlow, assistant engineer at Gastonia, N. C., under whose direction the work between Central, S. C., and Spartanburg, S. C., has been completed, is in charge of the work which was begun in April, 1917, between Spartanburg and Charlotte.

ARMED GUARDS ON RUSSIAN TRAINS.—The Russian Ministry of War has been authorized to provide armed guards for passenger and freight trains, anarchical conditions having been reported on the railways.

WASHINGTON CORRESPONDENCE¹

WASHINGTON, November 6, 1917.

Milton H. Smith, president; Addison R. Smith, vice president and George W. Jones, attorney for the Louisville & Nashville must answer the questions propounded to them by the Interstate Commerce Commission, in the course of its investigation under the Luke Lea resolution, adopted by the Senate in 1913. The resolution was offered, the officials of the railroad and other persons well informed as to politics in Tennessee and Alabama believe, to help Luke Lea retain the senatorship from Tennessee and to punish the railroad and railroad officials for refusing to help him. The commission, however, was not concerned with the motives that promoted the senator from Tennessee to offer his resolution or the senators voting for its adoption.

After some inquiries were made soon after the adoption of the resolution, the subject slumbered until the winter and spring of 1916 when the officials mentioned were summoned to Washington and asked about political contributions they are supposed to have made in Tennessee and Alabama. They declined to answer, on advice of counsel.

The supreme court of the District of Columbia cited the officials to show cause why they should not be required to answer and decided that they were not acting under a constitutional exemption from answering the question. Appeal was taken to the supreme court of the United States. Speaking through Justice McKenna, the court held, on November 5, that they must answer.

The court differentiated this case from the celebrated Harriman case pointing out that in that instance the Commission was endeavoring to make E. H. Harriman tell of Union Pacific stock transactions carried on for him by his brokers. The court held that that was a private matter into which the act to regulate commerce could not give the commission a right to make inquiry. It said that the commission's power was confined to inquiry concerning matters and things on which a formal complaint could be based or a proceeding could be had on the commission's own initiative. Stock transactions by Mr. Harriman, it suggested, did not come within the four corners of the act.

In the Louisville & Nashville case the question was as to what the officials of the railroad company and its affiliated company, the Nashville, Chattanooga & St. Louis, had done with the funds of the corporations in the way of political work. Justice McKenna discussed the case at length. Among other points made by him are:

"The Interstate Commerce Act confers upon the commission powers of investigation in very broad language, and this Court has refused by construction to limit it so far as the business of the carriers is concerned in their relations to the public, and it would seem a necessary deduction from the cases that the investigatory and supervisory powers of the commission extend to all the activities of carriers and to all sums expended by them which would affect in any way their benefit or burden as agents of the public. It is grasped thoroughly and kept in attention that they are public agents, we have at least the principle which should determine judgment in particular instances of regulation or investigation, and it is not far from true, and it may be entirely true, as said by the commission, that 'there can be nothing private or confidential in the activities and expenditures of a carrier engaged in interstate commerce. . . . It is said to be confined to cases where an inquiry is instituted as to any matter or thing concerning which a complaint is authorized to be made, or concerning which any question may arise under any provision' of the act 'or relating to the enforcement of any of the provision' of the act. In other words, that the inquiry is determined by the manner of procedure. The objection overlooks the practical and vigilant functions of the commission. To sustain it, appellant seems to urge

that there must be put into words by some complainant or by the commission, if it move of itself, some definite charge of evil or abuse and put into expression some definite remedy; and that an inquiry must not transcend either charge or remedy. To so transcend, appellant urges, would be an exercise of autocratic power and is condemned in *Harriman v. Interstate Commerce Commission*, 211 U. S. 407. Appellant presses that case beyond its principle and we may observe that section 13 has been amended and broadened since the decision in that case. The inquiry in the present case is more immediate to the functions of the commission than the inquiry in that"

TRAIN ACCIDENTS IN SEPTEMBER¹

The following is a list of the most notable train accidents that occurred on the railways of the United States in the month of September, 1917:

COLLISIONS						
Date	Road	Place	Kind of Accident	Kind of Train	Kil'd	Inj'd
8.	Chicago, B. & O.	Burlington.	xc	P. & F.	0	10
13.	S. A. L.	A. C. L.	bc	P. & F.	0	4
15.	Denver & R. G.	Maxwell.	bc	P. & F.	0	78
16.	Chicago, B. & O.	Earlville.	rc	F. & F.	7	6
17.	N. Y. N. H. & H.	Taunton.	xc	P. & F.	0	5
17.	Pere Marquette.	Bay City.	bc	P. & F.	0	3
20.	Pere Marquette.	Riverside.	bc	P. & F.	1	5
20.	Louisville & N.	Seco, Ky.	bc	P. & F.	9	40
22.	G. C. L.	I. & Gt. No.	xc	F. & P.	0	2
26.	Nashville, C. & St. L.	Atlanta.	rc	F. & F.	0	6
28.	St. Louis & S. F.	Kellyville.	bc	P. & F.	25	28
DERAILMENTS						
Date	Road	Place	Cause of Derailment	Kind of Train	Kil'd	Inj'd
4.	Ches. & Ohio.	Bremo, Va.	d.bridge	P.	0	2
4.	Southern Pac.	Noonan, Tex.	b. rod	P.	0	5
7.	Louisville & N.	Paris, Ky.	d. truck	F.	0	1
*10.	Pere Marquette.	Cedar Lake.		F.	5	1
14.	Great Northern.	Basin, Mont.	d.bridge	P.	2	36
15.	Southern	McRae.	der. sw.	F.	2	0
15.	A. C. L.	Rose Hill.	washout	F.	1	0
18.	Baltimore & Ohio.	F. O. Tower.	b. wheel	F.	0	0
19.	Louisville & N.	Kirkland.	b. rail	P.	0	5
20.	Baltimore & Ohio.	Dawson, Md.	b. flange	P.	2	0
22.	Central N. J.	Danellen.	b. tire	P.	1	0
23.	Pennsylvania	Wilmore.	b. rail	F.	0	0
25.	Missouri Pacific.	Arkadelphia.	b. axle	P.	0	4
OTHER ACCIDENTS						
Date	Road	Place	Cause of Accident	Kind of Train	Kil'd	Inj'd
*1.	Chicago, B. & Q.	Somonauk.	Fire	F.	..	..

The trains in collision at Burlington, Iowa, on the 8th of September were a local passenger of the Chicago, Burlington & Quincy and an empty standing train of the Chicago, Rock Island & Pacific, the first named running over a misplaced switch and striking the other at moderate speed. Both enginemen, both firemen, one conductor and five passengers were injured.

The trains in collision at Jacksonville, Fla., on the evening of the 13th of September were southbound passenger No. 23 of the Seaboard Air Line and northbound passenger No. 80 of the Atlantic Coast Line. The southbound train was entering the station and the northbound was leaving, No. 23 having been admitted to the same track by reason of a misunderstanding between towerman and switchman. Both trains were moving at low speed. An express messenger and three passengers on the southbound train were injured.

The trains in collision at Maxwell, Utah, on the 15th, were a westbound special carrying soldiers and an eastbound regular train. Fifty-three soldiers, 21 other passengers and four employees, were injured. The men in charge of the eastbound train misread a dispatcher's order.

The trains in collision, near Earlville, Ill., on the night

¹ Abbreviations and marks used in Accident List:

rc, Rear collision—bc, Butting collision—xc, Other collisions—b, Brecken—d, Delictive—smf, Inforeseen obstruction—unx, Unexpected—l, derail, Open derailing switch—ms, Misplaced switch—acc, obst., Accidental obstruction—malice, Malicious obstruction of track, etc.—boiler, Explosion of locomotive on road—fire, Cars burned while running—P, or Pass, Passenger train—F, or Ft., Freight train (including empty engines, work trains, etc.)—asterisk, Very wholly or partly destroyed by fire—Dagger, One or more passengers killed.

of the 16th, were eastbound freights. The leading train, carrying live stock, had been unexpectedly stopped and its rear end was struck by the following train, which had run past both distant and home automatic block signals set against it, and also had disregarded the signal of a flagman. Five drivers riding in a passenger car ahead of the caboose were killed outright and two more died later, and six others were injured. The engineer at fault was asleep. The fireman was engaged in putting coal into the firebox.

The trains in collision at Taunton, Mass., on the evening of the 17th, were a southbound passenger and a freight train which was switching on the main track. Twelve passengers were slightly injured. The passenger train had disregarded a stop signal.

The trains in collision on the Pere Marquette, at Bay City, Mich., on the morning of the 17th, were a westbound passenger and an eastbound freight. The engineer, fireman and one passenger were injured.

The trains in collision at Riverside, Mich., on the night of the 20th, were southbound passenger No. 16 and a northbound freight. One trainman was killed. The collision was due to the failure of the freight to wait, as ordered, at Riverside, to meet the passenger.

The trains in collision near Seco, Ky., on the night of the 20th, were a southbound passenger and a locomotive with no person on board. The fireman of the passenger train and three passengers were killed; 40 passengers and 5 employees were injured. Several of the injured subsequently died. The runaway engine had been started from Neon by a laborer in the mechanical department, who attempted to move the engine without authority to do so, and being incompetent to do such work, lost control of the engine.

The collision at Houston, Tex., on the evening of the 22d occurred at the crossing of the Gulf Coast Lines and the International & Great Northern, at Commerce avenue; a switching engine of the last named road backing into passenger train No. 2 of the Gulf Coast Line. The switching engine was moving at moderate speed. One passenger car was overturned and two passengers were injured.

The trains in collision at Atlanta, Ga., on the evening of the 26th, were a southbound local freight consisting of an engine, three cars and a caboose and a preceding train consisting of a locomotive and 20 cars, the engine pushing the car. Both engines and one car were damaged, and the car ahead of the yard engine took fire, apparently from burning oil in the headlight of the locomotive, and the car was destroyed. Six trainmen were injured. The collision was due to excessive speed of the local freight within yard limits.

In the butting collision of passenger trains on the St. Louis-San Francisco, a short distance west of Kellyville, Okla., on the 28th of September, 23 passengers and 2 employees (not trainmen) were killed and 29 passengers and 8 employees were injured. The westbound train was regular passenger No. 407, and the eastbound was an extra. This train had the right to the road, by a regular dispatcher's order, and the westbound should have waited for it at Kellyville. The eastbound train, engine 1322, consisted of empty passenger equipment, being taken east for troops. No. 407 met, at Kellyville, regular eastbound passenger No. 408, and also an extra train, engine 1343, consisting of empty passenger equipment, which had reached Kellyville on its timetable rights; and the men in charge of No. 407, seeing the two trains on the side track, assumed, without making the proper identification by engine numbers, that the extra was the one named in their order. The conductor admitted that he, and also the engineer and a brakeman, had neglected to verify the engine number. The colliding trains were running at about 30 miles an hour. The fatalities were in the leading passenger car of the westbound train, which was crushed by the mail car. The eastbound train, all empties, was badly wrecked.

The train derailed near Bremo, Va., on the 4th, was

Mixed Train No. 307 of the Buckingham branch. The train was moving slowly backward and had partly crossed a bridge when the engine and a loaded coal car, on the north span of the bridge, broke through and fell to the river below. The engineer and one brakeman were injured.

The train derailed near Noonan, Tex., on the 4th, was the westbound Sunset Limited. Two passengers and three trainmen were injured. The derailment was due to the dropping of a brake rod, which caught in an anglebar of the track; this was followed by a brakeshoe catching between the wheel and the rail. Four cars were overturned.

The train derailed near Paris, Ky., on the 7th, was northbound fast freight No. 42; 14 cars were wrecked. Sulphuric acid bursting from tank cars flooded the ground and injured a trespasser. The flow of the acid was so copious that streams were polluted and prompt measures had to be taken to prevent cattle from being injured in drinking. The derailment is believed to have been due to a defective truck.

The train derailed near Cedar Lake, Mich., on the 10th, was a westbound freight. Two cars were wrecked and were destroyed by fire. Five trespassers were killed, being buried under the burning cars.

The train derailed near Basin, Mont., on the 14th was eastbound passenger No. 238. The engine broke through a bridge, and with the first two cars, fell to the ravine, 20 ft. below. The engineer and fireman were killed, and 36 persons were injured, one, the dining car cook, fatally. An officer of the road reports the cause of the accident as "unknown."

The train derailed at McRae, Ga., on the morning of the 15th, about three o'clock was a northbound freight. The engine was derailed at a derailing switch and overturned and the engineer and fireman were killed.

The train derailed near Rose Hill, N. C., on the morning of the 15th, about 2 o'clock was a northbound freight. The engine was overturned and one brakeman was killed. The cause of the derailment was a washout due to sudden torrential rain.

The train derailed on the Baltimore & Ohio near F O Tower, Pa., on the 18th, was a through freight. One brakeman was slightly injured. The derailment was caused by a broken wheel and the road was blocked 14 hours.

The train derailed at Kirkland, Ala., on the morning of the 19th, was northbound passenger No. 38. The engine and seven cars were ditched. Five passengers were injured. The cause of the derailment was a broken rail.

The train derailed near Dawson, Md., on the 20th, was an eastbound freight. Two trainmen were fatally injured. The cause of the derailment was the breaking of the flange of one of the wheels of the tender.

The train derailed on the Central of New Jersey near Dunellen, N. J., on the 22d, was a westbound passenger. The engine (No. 304 of the Philadelphia & Reading, manned by P. & R. crew) fell against a freight train on an adjacent track, and the engineer was fatally injured. The cause of the derailment was the breaking of the tire of the right leading wheel of the front truck of the engine.

The train derailed at Wilmore, Pa., on the 23rd, was a westbound freight. Eight loaded and 12 empty cars were wrecked and scattered over all four tracks, and the track tanks of track No. 4 were damaged for a length of 456 ft. The cause of the derailment was a broken rail.

The train derailed near Arkadelphia, Ark., on the 25th, was northbound passenger No. 4. The engine and two cars were ditched; the engineer, fireman and two mail clerks were injured. The cause of the derailment was the breaking of the axle of the main driving wheels of the locomotive.

The train involved in the accident near Somonauk, Ill., on the first, was an eastbound freight. A car containing provisions caught fire from burning waste on a heated journal, and 11 cars were burned up.

Electric Car Accidents.—Of the six accidents to electric

cars, reported in September, in each of which a score or more of persons were injured—all but one of which accidents were collisions—two were attended by fatal results; near Frackville, Pa., on the third, motorman killed, and near Derby, Conn., on the fourth, three passengers killed.

WITH THE RAILWAY ENGINEERS IN FRANCE

"Somewhere in an active sector," said a recent despatch from the American Field Headquarters in France, "the American railroad engineers are running trains right up to the front.

"An entire railroad system," the despatch continues, "from the general manager's office to the beat of the lonely track-walker, has been handed over to the Yankees by the French War Office. Trains manned by American boys are moving on a strict schedule, carrying shells for the guns, food for the French troops and the daily movement of *poilus* going forward or coming back on leave to rest.

"Temporarily the regiment is lent to the French for the operation of that railroad. The Americans may stay on the job there for the duration of the war or they may be shifted to some other line. They get French rations and their road is a part of the French system. But they wear their own uniform, draw American pay and run the road by their own method, which means economy of man power.

"Fifteen American women worked like biscuit-pushers in a beanyery, and when they began to lose ground against the crush of hungry Americans the colonel himself jumped behind the counter and poured coffee out of a big pail.

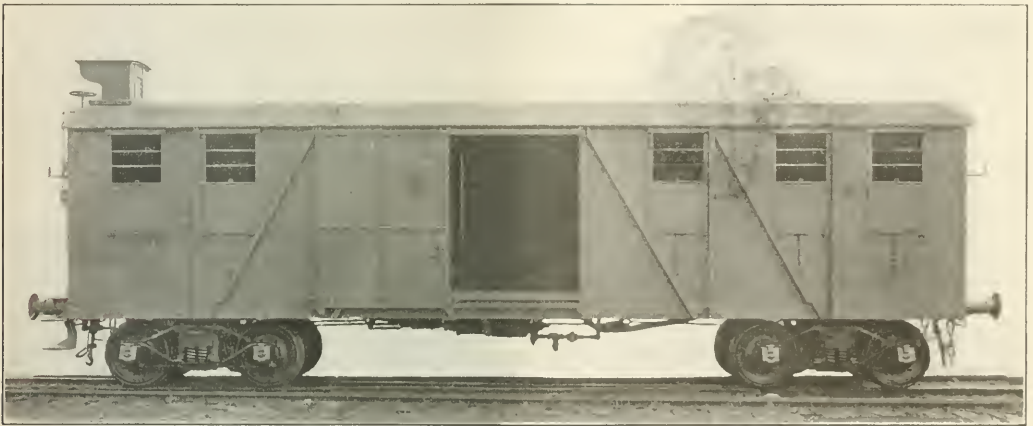
"There wasn't much time. The troop train slid into the station, the Yankees piled in, forty to a car, and the officers clambered into their coach.

"Up forward the whistle tooted cautiously; a lantern flashed and the train moved out, carrying the first Americans to the front."

IN THE PARIS-ORLEANS SHOPS

Lieutenant C. G. Brown, of Company E, of the 19th Engineers, the railway shop regiment, in a letter to his professors at the Pennsylvania State College, writes that his company has taken over parts of the Paris-Orleans shops. Lieutenant Brown graduated from the railroad mechanical engineering course at that college 1916 and prior to receiving his commission in the 19th Engineers was a special apprentice in the Pennsylvania Railroad's Altoona shops.

"We have been ready to go to work," he wrote, "and with long hard days I was glad to get to bed by 11. Today we started. Owing to delays in shipment of overalls, tools and all manner of equipment, we had a busy two weeks' work getting set, but with a hundred and one typically French delays, we got off.



Standard Gauge Box Car Built by the Pullman Company for the American Forces in France

"At some points their line is within the range of the Boche guns and shells crump at random along the right of way. At night there is danger of Boche aeroplanes slipping through the tight French aerial patrol and bombing the Yankees at work. This has happened, but so far our troops have had no casualties.

"The correspondent was with engineers when they marched to the troop train to move forward. The move was made without any unnecessary sound to guide Boche air raiders. Along pitch dark streets they swung through the town to the music of their own hobnails beating on flint pavements. The bandmen were there with their horns smothered in green kimonos to prevent the moonlight from glinting on the brass.

"The American commander kept the time of departure secret so that half the town would not stay awake till 1 a. m., to see his boys off.

"Breaking into single file the Americans stepped out of the darkness into the American Red Cross buffet at the railroad station, stowed away their rifles and steel helmets and lined up for free chow.

"We have taken over parts of the Paris-Orleans shops. They do not compare with those in Altoona, but they are bigger than the average P. R. R. shops, except those at Philadelphia and Trenton, and have many American tools. The engines range from ones much smaller and older than any we have to ones as big as our regular freight engines or even a bit larger. Our men started in on a bit of an engine, built in 1885 in Alsace Lorraine, and now in yard service. Starting at 6:30 a. m., with one and one-half hours out for dinner, they had the engine completely dismantled by 5 p. m., ready to start repairs. The French have been in the custom of taking three or four days to get this far, from what I understand. When our men get accustomed to the work and the new measurements, they will do still better.

"I get up at 5 a. m., to walk to the shop. I could write for an hour on shop conditions, many strange peoples working in them, including French women—who do all kinds of work.

"After having been away from shop work for over four months, the clang of the boiler shop was like music. For

the most part, things are much like the equipment in the American shops. The French go at the work in much the same general way, but much slower and more painstakingly than we do at home. We find quite a few machines built in the United States and a number of German make.

"I am general foreman of the erecting and machine shops. This work covers that part of my special apprenticeship. I have 120 men under me.

"We have had fine weather here since our arrival; only two rain storms and it is in the middle of September.

"When this reaches you I shall have finished my fifth month in uniform, and have not had a single regret over going into the service."

FOURTEENTH ENGINEERS TRIM CANADIANS AT BASEBALL

One of the interesting bits of news concerning the doings of the railway engineers in France is the story of the baseball game which Company F, of the 14th Engineers, won by a score of 9 to 4 from a crack team of Canadians.

Captain F. P. Paten, of Company F, was formerly a general yardmaster on the New York, New Haven & Hart-

ford to either right or left field, on account of the wall on one side and the embankment on the other, so that ground rules prevailed. Between first base and third base was the only chance of placing a long drive. Now in your imagination bring yourself to imagine a sloping bank, pitched at a degree of 45, 1000 convalescent soldiers sitting in the sunlight on the side of this hill, the top fringed with officers, nurses and men on stretchers, 45 feet above the players. The ancient brick walls back of first base, over-hung with moss and fringed in places with vegetable life, and in some places age had begun its work and bricks were missing from the wall, and on top of this parapet, another fringe of soldiers, civilians and nurses, some of whom had never seen a baseball game before, but were being coached by the very large number who had.

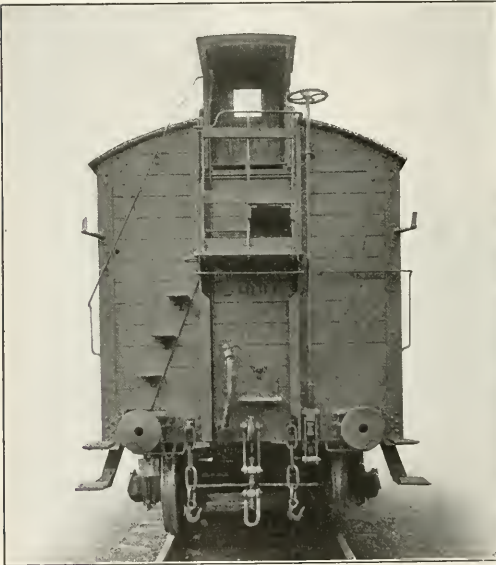
"The final score was 9 to 4, the game being decided in the fifth inning when the Americans with four runs overcame a score against them of 3 to 1. They added 4 more in the seventh and the Canadians also got one in that inning. The Americans made 16 hits, the Canadians 9.

"At 6:30 in the evening, after the game, the men piled into their automobiles and started on a 30-mile trip back to camp."

FORDS FOR DIVISION SUPERINTENDENTS

The Chicago, Burlington & Quincy has converted a number of Ford automobiles into motor cars for the use of division superintendents. These cars are used for inspection purposes and also to enable the officers to travel over their divisions whenever it is necessary. They have been found particularly convenient on branch lines where the train service is infrequent.

To adapt the automobiles to operate on rails the standard wheels are replaced with pressed steel wheels, which are attached to a rigid axle. The steering wheel is inoperative, the steering post serving merely to support the throttle and



End View of the Box Car Showing the Guerie. One Car in Ten Has This Arrangement for the Brakeman

ford and his company is made up principally of New Haven Railroad men. Captain Paten in the story which he wrote about this ball game to one of the Boston papers said that most of the men on his team were former Boston high school baseball stars. The Canadian team was composed of five members of different Canadian baseball teams and four Canadian officers, who have played ball with their different colleges.

"This Canadian team," he wrote, "has been together for the past two seasons, playing their first game, after leaving Canada, in Egypt. They have been through the Dardanelles campaign, and are now located within 30 miles of our camp. They have been defeated but once, meeting teams in different parts of the hemisphere, composed of Canadians, Americans and some Englishmen.

"The diamond was constructed by German prisoners under the direction of the Canadians. It was of regulation size, and very nicely laid out, but with no chance of a long



A Ford Extra on the Burlington

spark levers. Since the steel wheels are somewhat smaller than those with which the car is regularly equipped, it is necessary to apply racing gears instead of the standard gears furnished with the car. With this modification a speed of 40 miles an hour is readily attained.

A frame is placed under the center of the car on which it is raised when it is necessary to turn it or to remove it from the track. The cars are run under train orders, the driver acting as engineer and the superintendent as conductor. The ease with which repair parts can be obtained in case of a break-down has proved to be a great advantage in the operation of these cars. The Burlington is planning to fit up a large number if the results secured from those already in use are found to warrant it.

Conservation and Reclamation of Material*

Review of Numerous Means By Which the Service of
Railway Material May Be Extended and Increased

By M. K. Barnum,

Assistant to Vice President, Baltimore & Ohio, Baltimore, Md.

“CONSERVATION OF MATERIAL” is a broader term than reclamation, the one frequently used, and, therefore, I think preferable. The reclamation of material has commonly been limited to the sorting of old material, particularly scrap, and picking out such parts as could be repaired and restored to service. Conservation goes much further than that because it is defined as “the preservation of natural resources for economical use.” The saving and economical use of material, in any manner, may be considered as the conservation of material. Most of the suggestions I will offer pertain to the collecting and sorting of material which is either serviceable or can be repaired for service, and some other items that may properly be considered in this connection.

The present prices of most material that the railroads use are from twice to four times what they were two or three years ago, and the value of scrap has increased somewhat in proportion, so that it is more profitable now to work over old material than it was then.

The first and most important thing is to collect the old material, and it is surprising to see how the small bits of iron and steel, such as rivet heads, nuts, washers, etc., that are a by-product of repairing cars, count up when gathered together in a pile. The best way to show the value of this small scrap that, ordinarily, is thought to be worthless, is to pick it up and keep an account of the labor and weight of material collected, and the result will be very convincing. As an example—not long ago at one of our steel car repair tracks boys were employed to gather rivets and rivet heads and in four or five weeks collected about 40 tons, worth over \$1,300 at a cost of about \$100 for labor. At another yard men were unloading yard cleanings into a swamp to release the cars and to fill the swamp. It was noticed that in this stuff there were some small bits of iron, which the men were instructed to throw into a box, and in a month they had saved about 30 tons of scrap worth, approximately, \$1,000.

The scrapping of old cars leaves many truss rods, arch bars and other kinds of iron and soft steel, which can be worked over into new forgings, and our road has a rolling mill in which such pieces are worked down into bar iron for grab irons, safety appliances, etc. This mill, which cost approximately \$10,000 installed, produced a net profit, in the first six months of this year, of over \$40,000. Some roads have questioned the advisability of installing such a plant, but I see no reason why any railroad which has a considerable amount of rolling stock cannot profitably use a re-rolling mill.

In gathering up and sorting scrap iron from cars and locomotives and track work it is always found that a considerable amount of good material is brought in, which should be carefully culled out, as much of it can be returned to service with slight repairs. Brake shoes which are good for more mileage are often found in the scrap, having been taken off because they would not make the long runs, and these brake shoes are sorted out and applied to cabooses, cars and locomotive tenders that are on short runs.

It is hardly necessary to quote in detail the increases in prices of locomotives and cars, but I have some figures here which show that in the two years between May, 1915, and

May, 1917, there was an average increase of 50 per cent in the cost of steel passenger cars, 75 per cent in locomotives and 75 to 100 per cent in freight cars.

It was formerly the practice of many roads, when their freight cars had reached the limit of their profitable life, to burn them so as to get the scrap iron out in the easiest way, but it has been found that burning iron reduces its value approximately 10 per cent as scrap, and the wood is destroyed. Tests which we have made show that the cost of dismantling a freight car is from \$5 to \$10 and saving the wood in condition for further use, results in a net profit of from \$10 to \$20 per car, according to the design. Our road has built many platforms, fences, storage bins, etc., and by using such second hand material we make a perfectly good job at small cost.

Many roads have reclamation plants, and I think they are all working profitably. The more common practices of cutting bolts to shorter lengths, rethreading them, repairing brake beams and sorting out the usable material, such as nuts, washers, etc., are followed on nearly all roads. The road with which I am associated has three such plants, the largest being at Zanesville, O., where we handle anything that is worth working over and fit it for service. There is a tin shop where we repair oil cans, lamps and tinware of all kinds. We have a shop where signals which have been replaced with new or larger sets are thoroughly overhauled, tested and prepared for installation at less important points. There is a saw-mill at which second-hand bridge timbers and various kinds of pile butts, etc., mostly coming from the maintenance of way department, are worked over into usable sizes, and they are prepared to fill orders for a large variety of finished material for buildings, car braces, car siding, roofing, etc. Some of the pieces are large enough to make good track ties, while the small pieces can be used for repairing hand cars, push cars, etc. Most of that material is practically worthless until it is resawed, after which it is worth from \$20 to \$60 per thousand feet. At the same shop we save the scrap pieces of wood and reduce them into charcoal for dining cars and shops, effecting a saving of about \$90 a month.

Our road has a large number of locomotives equipped with stokers, which have proved so satisfactory that they are used on all new freight locomotives. After four or five years of service some parts wear out, and we have fitted out one shop for the reclamation of stoker material, where we can do almost any kind of work up to building a stoker complete.

The electric and gas welding processes have revolutionized a large amount of shop work which was formerly done by forging, riveting or in other ways, and I believe that there has been no one process introduced in the last ten years that has been of greater help to the railroads. The collars of worn car axles and sharp flanges on locomotive tires can be built up successfully; the latter operation is often done under the engine, thereby saving the cost of removing the wheels or tires. The building up of flat spots on tires and car wheels and of worn coupler locks and knuckles enables them to be retained in service, and a great variety of castings which break can be welded and made practically as good as new. One of the biggest savings that has been effected is by the welding of broken cylinders. One of our

*From a paper read before the New York Railway Club.

master mechanics told me, recently, that a saving of about \$4,000 had been made in one month by the welding of broken cylinders. The welding of firebox sheets, both for repairs and new work, is being done successfully, and in some railroad shops the entire firebox is welded up without the use of rivets except in the mudring.

Much track material is sent in as scrap which in the past had not been thought worth working over, but we have found that it pays to reclaim track spikes, nuts, washers, track bolts and anti-creeper, and much can be saved by building up worn switch points and frogs by the welding process.

The use of old ties has been studied by most railroads, and, in every case I believe, the conclusion has been that it does not pay to pick them up, bring them in to terminals and cut them up for firewood or similar purposes, because the expense of collecting and preparing them for use makes them cost as much, or more, than new wood. So the usual practice is to pile up old ties alongside the track and burn them.

Some of the larger roads have timber treating plants and there are several commercial plants which treat ties and timber. The fact that this treatment costs only about 25 cents a tie and doubles the life of the tie makes it an excellent proposition. The average railroad tie, in the middle and eastern United States, has a life of about 7 years, not treated, and, when treated, it runs to 14 years or more, the first price of the tie being the same in either case. In using treated ties it is customary to apply steel tie plates under the rails, to prevent the ties from being cut and spoiled by mechanical wear before they rot out.

One other very profitable department of reclamation work is the saving and repairing of grain doors. Some roads have a large grain business, and they have found that grain doors can be repaired for about 10 cents a piece, whereas, a new door will cost not less than 75 cents. The repairing of grain doors leaves a considerable amount of small pieces, which can be cut up and used for dunnage and powder strips, and also for making boxes for shipping nuts, bolts, etc.

The collection and baling of old paper for sale has recently been quite profitable, although for a time it was not worth while. One station on our road sold \$128 worth of old paper after a house cleaning, and another sold \$700 worth within a year. Those are some of the larger stations, but they show the desirability of saving all old papers for sale.

Another item which has not received much attention in the past, because it was not thought worth while, is the saving of coal and coke which becomes scattered along the tracks in switching yards. When coal could be bought for \$1 a ton at the mines, coal thus reclaimed hardly repaid the cost of picking it up, but at the present high prices it is worth saving.

I have said that the most important thing is to collect the old material so that it can be sorted out and the good separated from that which is only scrap. As an inducement to the section men to pick up material along the tracks, one of our superintendents has offered prizes to the section foremen who pick up the largest number of one inch nuts, and, on another occasion, the largest number of oil cup caps. The result was surprising and gratifying. One foreman turned in about 300 and another one about 200 nuts, most of them as good as new.

Many railroads are using box cars with either inside or outside metal roofing, and when they reach their limit of life much of the roofing is fit for further service. It can be used for making stove pipe, pails, cans, for roofing buildings and for many other purposes.

Some of the secondary results of the conservation of material and the cleaning up of scrap are the improved appearance of the property, the greater orderliness and a

stimulated interest on the part of the men in taking care of material.

Our company has studied the wastes in dining cars, and a great deal has been accomplished in reducing them. The prices of all supplies have gone up, but, by following the advice of the Federal Food Commission, the prices of meals have been kept down pretty nearly to what they were heretofore, while the quality has been kept up, and, at the same time, a considerable saving has resulted.

The use of stationery and office supplies has been watched, with some care on most roads, but the amount of it is so great on the average road that it is worthy of closer attention. We have one man who gives his entire attention to the study of requisitions and the inspection of stock on hand at various offices, with very profitable results.

Some reclamation operations that have been tried are of rather doubtful value, and it is a question whether they pay. Among these are the re-making of brooms, renovating caboose cushions and camp mattresses, retapping nuts and tinning lanterns. The question of painting brake beams and springs, after they have been repaired, is open to discussion but I believe it pays.

Another important item of conservation, which is worthy of more attention, is the protection of material from the weather, especially near the seacoast, where there is a good deal of wet and stormy weather. All finished work, such as threads of bolts, nuts and pipe, should be protected from dampness, or they will soon become rusted beyond any possible use. The same is true of steel plates and many of the finished parts for locomotives; dressed lumber for car work ought to be protected from rain, snow and sun. The ordinary rough castings stand exposure for several years, but if small they will be seriously damaged in a few months.

As an example of the value of scrap, I have obtained the figures for a large road, which show that in 1916 over \$3,000,000 worth of scrap was sold and for the first six months of 1917 over \$2,000,000 worth.

The motto which the railroads have adopted to guide them in their work is "What can we do to help win the war?" and this test should be applied to every problem that arises, because that is the biggest question now before us. Therefore, the conservation of material is more important now than ever before and it is one of the things that will be most helpful in winning the war.

DISCUSSION

E. J. McVeigh, general storekeeper, Grand Trunk System: Material is money, first, last and all the time. Unfortunately the railways have not learned that simple fact. They have never taught their employees to think of material as money. Due to the peculiar nature of railway operation, costly material is placed in the hands of many men totally untrained in the handling and value of the material. How many trainmen have been told that a journal bearing costs \$6 when new and is worth \$4.80 after it has served its purpose, if it is returned to the stores department; that a steam hose is worth \$4.80 new and \$3.80 after it has been worn out?

The railway "material man" buys, receives, cares for and delivers new material, but in addition to this he should educate the men handling the material as to its value, both new and old. When the material has fulfilled its function it once more becomes material and the material man does not let go of it until he knows that it has been conserved. The material man should have the proper facilities and organization for doing this. The old method of selling all used material as scrap has made the scrap dealers rich. Those roads which have developed central scrap and salvage yards have found that it pays. Average figures show a net increase of \$4.85 per ton in the price received for scrap that is examined for usable material and sorted. In addition to this

the reclaimed material is of great value to the car repair and shop men. It keeps them well supplied with material.

Neglecting the material for the convenience of the repair forces we have the \$4.85 net gain where a railroad handles its own scrap. A railroad will "make" three tons of miscellaneous scrap per year per mile of road operated. Thus a road of 4,000 miles will be able to save \$58,200 per year by handling its own scrap. In brass there is still a larger amount to be saved. The salvage in all hose is very large. What other department of a railroad on so small an investment can show so great a return?

W. F. Jones, general storekeeper, New York Central: If the materials throughout the world wasted today were saved and applied to proper uses, we would be confronted with an economic revolution tomorrow. When a man's hands are full, it is natural for him to be extravagant. It is born in him and nature has placed before him almost unlimited resources to be obtained at the expense of but little endeavor. He has been prodigal from his birth and only frugal when compelled by necessity.

To change this inherent characteristic has been the life-work of many men who have had the foresight to realize that, with our ever increasing population, the time will come when we will be confronted with a fight for existence.

In managing a business where men are employed, waste and extravagance will reduce the profits unless a watchful eye is placed on every detail of operation. This is not so difficult in a manufacturing plant where each individual workman is under the direct personal supervision of his foreman. Different conditions prevail in operating a railroad. While a large number of men are employed in buildings, under direct supervision, there is a vast army under indirect supervision, in the yards, along the road and on the water.

Conservation should begin with the quality of the material. It is not a paying proposition to use inferior material in a job that requires the best material than can be manufactured. A pair of wheels for a car may cost \$25.00 and the scrap value may be relatively high. The expense of that pair of wheels is not in the material, but in the delay to the car and contents, cost of switching, and labor of handling and of application and removal. If the life of a pair of wheels can be increased twelve months by using better material, even at increased price, would we not be conserving material?

Le Roy Cooley, general storekeeper, Central of New Jersey: Reclamation is so closely interwoven with conservation that I consider the two go hand in hand. If you can make the old material last a little longer or perform a further function you are conserving the new.

We have no elaborate scrap docks equipped with expensive machinery; we handle our reclamation work through our main locomotive and car shops, but not always with skilled labor, unless the class of work so demands. I will mention a few of the practices which we employ that might be of interest. No doubt all present have observed how the siding of box cars first becomes decayed at the sills and eaves, requiring renewal while the center portion is practically as good as new. Our practice is to cut off the decayed ends and use the siding as roofing.

A year or so ago all roads were obliged to re-build in a degree practically all of their equipment to meet the demands of the Interstate Commerce Commission, necessitating the removal of grab irons, brake wheels, brake staffs, cutting levers, etc. The old grab irons were used for the construction of bolts, as were also the brake staffs and cutting levers. The brake wheels which we were obliged to remove did not have sufficiently large brake staff fit to meet the requirements. We were able to reclaim practically all of these wheels by heating them and forcing the hole larger with a punch of proper size, with but little expense and little loss through breakage.

We have a rattler through which we pass all old or rusty nuts and washers. They are then sorted and those requiring re-threading are given such attention.

We found some time ago that it was possible in a large degree to reclaim our cast steel journal boxes through the electric welding process, by building them up in places where worn. This is also being done with front end coupler pockets, many of which require renewal on account of the pin holes becoming elongated. Our practice is to true up the hole by the electric welding process and return the pocket to service. Electric welding of bolsters and side frames is no doubt a common practice and the saving is enormous.

R. V. Wright of the *Railway Age Gazette* called attention to the moral effect the reclamation of material has on the men. Before the war there was plenty of material and at the prices that prevailed at that time it was not economical to reclaim material to the extent that it is at the present time. The fact that material is scarce and that the cost has risen materially should be impressed upon the men so that this matter will be given the proper attention. In addition to the material the conservation of labor is a very important problem and should be given consideration.

EDUCATION IN FREIGHT LOADING BY MEANS OF PHOTOGRAPHS

By Martin P. Kennedy

The Delaware, Lackawanna & Western has adopted a plan of photographing damaged freight in cars, and the idea has worked out so successfully in bringing the facts home to freight loaders that E. M. Rine, vice president, in charge of



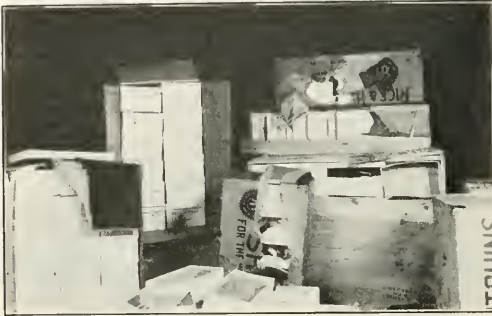
Car of Raisins from California on Arrival at New York.
Damage Due to Frail Crating

the operating department, is receiving numerous requests from other roads for details and data concerning its operation.

The plan was first advocated by Major F. H. Schoeffel, of Scranton, a graduate of West Point, now back in the ser-

vice in the inspector general's department. The major is the chief special agent of the Lackawanna, and in the latter part of 1915 succeeded in convincing President William H. Truesdale that all the letters that the various freight agents might write about the dilapidated condition of freight frequently found in cars on arrival at stations would not have one-tenth the effect that a picture of the actual conditions would produce.

Authority to proceed was given and 25 No. 3 Auto-graphic Kodak cameras were distributed to freight agents at the principal points on the line, at transfer stations and piers.



Freight Robbed in a Car from a Connecting Line

Sufficient film of two exposures each was also furnished, together with instructions on how to take the pictures, and just what conditions to photograph. Naturally time exposures must be made, the time depending on the light conditions. Agents were told that when a car was opened at their station



A Bad Case of Improper Loading and Stowing

with freight strewn around and damaged, apparently due to improper stowing at the loading point, or exhibiting evidences of pilfering, they were to photograph the interior of the car, taking at least two views, and mail the film at once to the chief special agent's office in Scranton with a written report. A dark room was fitted out in the office at Scranton, and

here the films are developed, printed, distributed and filed.

The results have been exceedingly gratifying. A sort of friendly rivalry has sprung up among the agents in their efforts not to let the other fellow get anything on them in



Wagon Wheels Loaded on Smoked Meat in Glass Jars

the form of a picture showing freight improperly loaded from their stations, with the result that a remarkable improvement was at once noticed in the manner in which freight was loaded and stowed in cars, which brought about a decided reduction in the loss and damage account. Agents who heretofore were inclined to be indifferent as to how the freight was loaded, just so they got the doors sealed and car started on its way, now exercise the utmost care, for they know that copies of these pictures are sent to the general superintendent's office, with a report, which of course discloses the loading point, and it is only natural to assume that a rebuke is in store for Mr. Agent at fault.

Then again the agent who receives a car in bad condition

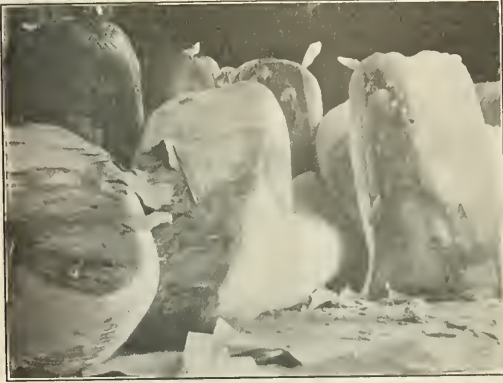


750 Cases of Condensed Milk Damaged Because of Improper Stowing, Making It Impossible to Get an Accurate Check of Car

and photographs it, feels that the agent responsible for the poor loading will surely await an opportunity to catch a car coming from the station that caught his car. What's the answer? The greatest care possible being exercised by all hands in loading and stowing their freight, with the result that there is considerably less damaged and broken shipments. The value of the cameras soon became apparent along more widely extended lines.

One of the principal improvements secured by these pictures were stronger containers for raisin shipments from

California to New York. Some of the pictures taken at New York piers of cars of raisins showed almost every box in the cars broken, and raisins piled on the floor, and these were sent to the originating line. The officers of that road presented the pictures to members of the California Raisin Association, who were astounded to see how their shipments were arriving at destination. No pen pictures could have



55 Sacks of Flour Damaged by Wet Due to Defective Roof and Side Boards

furnished such a forceful argument. The association immediately went on record as favoring more substantial crating, by which action it is hoped a great loss will be avoided in the future. This will not only save the shippers a great deal of expense, the railroad a great amount of work and expense, but will give the consignees much more satisfaction. These photographs furnish indisputable evidence to foreign



Codfish and Canned Goods Damaged by Shipment of Brass

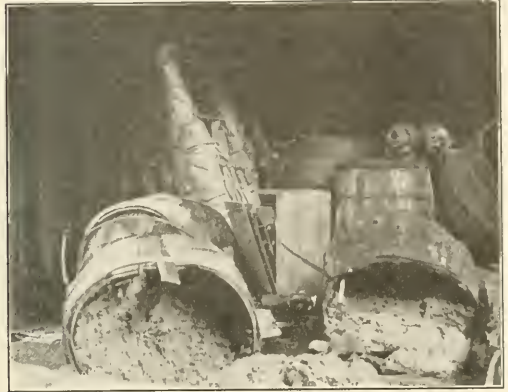
lines. When a car is opened on arrival from a connecting line and freight is found in topsy-turvy condition, no letter can furnish such a convincing argument as these pictures carry. The true conditions are placed right before the officer's eyes, and they can't get away from it.

The officers of one connecting line recently disputed that a car was delivered in a pilfered condition, but when they saw a photograph showing all the cases in the car broken open, they threw up their hands and acknowledged the correctness of our contention. The responsibility for damage to a carload of flour in sacks by moisture, on account of defective roof and side-boards, was recently placed

when a picture showing all the damaged sacks was displayed.

One car from the West with 750 cases of cans of condensed milk had so many cases broken and the contents so scattered that it was impossible to obtain an accurate check of the car.

In addition to furnishing a copy of these pictures to the agent taking them, and to the responsible agent, sufficient copies of the worst cases are distributed at various agents' meetings, which are held monthly. They are taken home by the agents and shown to all their employees engaged in handling freight, and the necessity for careful handling is emphasized. They are warned against having a picture of one of



Mustard and Fire Clay Damaged by Heavy Freight Loaded On It

their cars come back to them, and the improvement in the service indicates that they are paying heed to the warnings.

Pictures of damaged freight, due to frail crating, are frequently presented to shippers, who are beginning to be convinced of the serious loss the railroads are put to on this



Whole Shipment of Wall Paper Damaged, Due to Poor Stowing

account, and are taking steps to remedy the evil. The railroad company is developing this feature of the camera, and it is bound to become increasingly effective in its results.

The camera is also used by the special agents in photographing unsafe conditions along the line, train wrecks, and various other irregularities, and is becoming an important adjunct to modern railroading. That it is here to stay is attested by the number of railroads adopting its use.

Proposed Eastern Freight-Rate Increase

Good Progress in First Day's Hearings. Strong Statements by Rea, Underwood, Hustis and A. H. Smith

THE Interstate Commerce Commission seems likely to make relatively short work of the resumed fifteen per cent case. The first hearing was held on November 5 and arguments to close it are to be made on November 17, one month from the time the eastern carriers reported that the fears expressed by them last May were being realized. The determination to expedite matters was announced at the conclusion of a day of general testimony by executives of Trunk line and New England territories, supported by exhibits prepared by George M. Shriver, vice president of the Baltimore & Ohio and W. J. Cunningham, professor of Transportation at Harvard. George S. Hobbs, vice-president of the Maine Central also submitted statistics. Commissioners Meyer, McChord and Anderson asked questions that may perhaps be taken as showing a determination on the part of the first mentioned to make an attack upon the increase in maintenance expenses shown in 1916 over 1915, because, as Mr. Meyer pointed out to President Willard, the heavy charges for maintenance are being kept up. Meyer wanted to know whether the B. & O. obtained as much efficiency out of the \$5,000 a mile spent on maintenance in 1916 as it did from the \$3,000 spent in 1915. Mr. Willard said he could not answer the question because he had not in mind the conditions in the years proposed to be contrasted.

Only the irreconcilables said they would oppose the increase. Clifford Thorne and Samuel H. Cowan were the only ones of that class giving tongue to their thoughts on the first day of the hearing. Ross D. Rynder, speaking for what are generally known as the big meat packers, Arthur B. B. Hayes for the smaller ones, represented in the American Meat Packers Association, and Walter C. McCornack for the interior Iowa packers said their clients would not oppose the advances, viewing them as war measures, unless their industry should be singled out to carry burdens heavier than proposed for other industries. As to the protests and complaints which they have pending before the commission now, they said they would not withdraw them but would hold them in abeyance. Mr. Hayes, speaking for the Indiana limestone interests, said that if the admission was not to be deemed as a bar to specific charges of unreasonableness and discrimination per se, the Indiana people will not oppose.

FIRST DAY'S HEARING

At the morning session of the hearing of November 5, Presidents Samuel Rea and Daniel Willard spoke in general terms as to the conditions of the railroads. Both emphasized their conviction that even if the Commission allows the benefits withheld in June, the necessities of the carriers will not be met. Mr. Rea said the roads would have to come back for more, because they cannot do the impossible. They also pointed to the prices fixed by the government on fuel and iron, to show that such prices, hailed by the newspapers as reliefs, are higher than the prices paid by the railroads in 1916. As a war expedient solely, Mr. Willard proposed that the Commission allow the collection of one cent per 100 lb. on all freight. That is a suggestion made by a shipper at the hearing last spring as being infinitely better than a horizontal increase of fifteen per cent.

At the end of the day's hearing, Chairman Hall announced that the taking of testimony in the investigation-and-suspension-docket cases, consolidated with the fifteen per cent case would begin on the next day before Examiner Disque. Disque is the man who handled the Central Freight Association case and had the nerve to tell the carriers that

they had not made their rates for short hauls high enough, and he would show them what they should have done; he would make a scale of his own. He did that and the commission, for once in its life, gave the railroads more than they had asked for. The hearings, as scheduled are: anthracite coal, November 6; general commodities and live stock and I & S numbers 1142 and 1134, (petroleum) on November 9; and lumber and cement on November 13.

It was arranged that the executives should return for cross examination on November 15 and that arguments on the whole case should be made on November 17. No objection was made by any interest to this departure from the usual deliberate processes. It will mean herculean efforts by the clerical staffs brought to Washington by the railroads.

At the morning session the witnesses were examined by George Stuart Patterson, as chairman of the committee of lawyers acting for the eastern carriers; and by Hugh F. Bond, for the Baltimore & Ohio. At the afternoon session, C. S. Pierce, counsel for the Boston & Maine, was leader. At the morning session the witnesses were Samuel Rea, (Penn.); A. H. Smith, (N. Y. C.); F. D. Underwood, (Erie); George M. Shriver, (B. & O.); John B. Kerr, (N. Y. O. & W.); and Daniel Willard, (B. & O.). At the afternoon session Messrs. Rea and Willard resumed the stand for a short time and were followed by J. H. Hustis, (B. & M.); Howard Elliott, (N. Y., N. H. & H.); George S. Hobbs, (M. C.); and Prof. W. J. Cunningham

STATEMENT OF GEORGE S. PATTERSON

In opening the case for the carriers, Mr. Patterson said that for the first nine months of the year gross earnings had risen \$123,789,000 but an increase of \$168,431,000 in expenses had left them \$57,291,000 worse off than in 1916. The three great eastern systems—Pennsylvania, New York Central and Baltimore & Ohio—were \$38,492,000 behind last year, notwithstanding they had done \$70,607,000 more business. For the year ending June 30, 1917, the net operating income of all eastern roads fell \$44,996,000, in spite of an increase in traffic of \$154,336,000 over the previous year. Net return on property investment for the year fell from 6.52 per cent to 5.71 per cent.

The effective prosecution of the war is the paramount duty of the nation, and the capacity of mobilized industry to supply men, munitions and foodstuffs to the war zone is limited by our transportation resources. It was, therefore, imperatively in the national interest that the government neglect no available means to insure the rapid development of railroad facilities, and the strengthening of imperilled railroad credit.

The eastern lines are achieving remarkable efficiency records with a plant several years behind the growth of the country. Eight billion more ton-miles were produced in the first four months of the war than in the same period last year. This gain of 15 per cent in service rendered the nation, with only a 1½ per cent increase in equipment, was almost entirely the result of the heavier trainloading. The average trainload was increased from 705 to 782 tons, a gain of 11 per cent. Two freight trains are now performing the work done by three trains in 1910, a year of "peak" traffic.

In May the eastern roads asked the commission for a fifteen per cent rate advance, and they estimated that the new level of costs would increase their operating charges \$235,000,000 a year. They now show that this was too conservative, as present figures indicate an increase of \$270,000,000

based on the 1916 volume of business. The advance in coal amounts to \$78,000,000; in wages to \$102,000,000, and in materials to \$90,000,000; total \$270,000,000.

The great rise in bituminous coal, of which the railroads consume a quarter of the entire mine output, has cut deep into revenues. The Pennsylvania System, for example, burned last year in its locomotives 18,335,000 tons at an average cost of \$1.23 a ton. The government price is now \$2.45, and the Pennsylvania, for the past six months, has supplied its needs at \$2.40. This means an increase of \$21,450,000 a year for this one company for the single item of coal.

The labor problem is becoming increasingly serious because of the inability of the railroads to hold their men against the competition of private industries offering better wages, and the consequent lowering of labor efficiency. The Adamson wage advance to the train brotherhoods is costing the eastern roads \$36,000,000 more a year for the same labor, while advances to other classes of employees have swelled the payrolls by \$66,000,000.

To maintain roadbed and equipment at the standard demanded in the public interest is becoming increasingly difficult. Not only does the great advance in the cost of labor and materials correspondingly contract the purchasing power of the railroad dollar, but the great volume of traffic moving under emergency conditions is wearing out roadbed and equipment at an unprecedented rate. While the eastern roads are spending more for upkeep than last year, they are actually getting much less work done, and this deferred maintenance will eventually have to be provided for. This is one of the most serious factors affecting the present critical position of the eastern lines.

Mr. Patterson made a comparison, on the same basis as in the 5 per cent and 15 per cent cases, of the revenues of the 38 railroad systems comprising the Eastern carriers. This comparison, made up from exhibits placed in the record at the hearing, showed the following between the calendar year of 1917 and 1916:

(a) That for the nine months ending October 1, 1917, the operating revenues of the 38 systems increased \$123,789,000; their operating expenses increased, \$168,431,000 and their net operating income declined \$57,291,000, notwithstanding an increase in the property investment up to July 1 of \$227,000,000.

(b) The corresponding figures for the Baltimore & Ohio, New York Central and Pennsylvania systems combined, show an increase in operating revenues of \$70,607,000 and a decrease of \$38,492,000 in net operating income, notwithstanding an increase in property investment up to July 1 of \$61,000,000.

(c) September showed (for the 38 systems) an increase of operating revenue of \$16,453,000 and a decrease of \$6,429,000 in net operating income, or 14.8 per cent and for the three systems, an increase in gross of \$9,967,000, and a decrease in net of \$3,699,000, or 15.4 per cent.

(d) Every month in 1917 shows both for the 38 systems and for the three systems, an increase in gross (except February) and a decrease in net, notwithstanding an increase in carloads and trainloads of 2.6 and 79 tons, respectively.

(e) Comparing with the same periods of the previous year, the three months January to April inclusive show an increase in gross of \$31,713,000 or 6.1 per cent, with a decrease in net operating income of \$37,134,000 or 29.8 per cent. The period May to September, inclusive, shows an increase in gross of \$92,076,000 or 12.6 per cent and a decrease in net of \$20,156,000 or 9.3 per cent.

A comparison of the fiscal year ending June 30, 1917, with the fiscal year ending June 30, 1916, shows that for the 38 systems, there was a decrease in net operating income of \$44,995,000 notwithstanding an increase of \$154,336,000 in gross and of \$200,000,000 in property investment; so that the return on property investment has fallen from 6.52 per cent in 1916 to 5.71 per cent in 1917.

The estimates of increased cost for 1917, and of revenues from increased rates on the basis of the increased costs of 1917 over 1916 was estimated as of the day of the hearing as follows:

Increased wages	\$102,070,229
Increased fuel cost	86,574,375
Increased material cost	89,084,214
Total	\$277,728,818

In addition to the above it is estimated that the taxes for 1917 will exceed those of 1916 by \$19,020,000.

Mr. Patterson estimated that the increases in rates granted since January 1, 1917, will yield an addition to the operating revenue of the eastern lines of \$97,000,000, on the basis of the 1916 traffic. A grant of the remainder of the 15 per cent program he estimated would add \$58,700,000 making a total of \$155,700,000. Subtracting that sum from the \$277,728,818 of increased cost of wages, fuel and materials would leave \$122,000,000 of increased cost not covered by the increase in revenues resulting from a grant of the whole of the 15 per cent program. This difference between increased revenue and increased cost is about equivalent to 10 per cent of the 1916 freight revenues.

"The wasting of the railroad machinery without adequate replacement cannot continue indefinitely. Due to the strong foundation on which some of these railroads were built they went into the war period able to stand some stripping of maintenance. But they cannot continue. . . . The situation is serious. This commission and these companies must assume the responsibility of making it clear to our people that these lines are necessary and that they must be kept in good condition and that they shall be able to expand in such degree as will enable them to take care of their peak load."

COAL STATISTICS

Mr. Shriver presented exhibits to support the extemporaneous remarks to be made later by President Willard. President Kerr, of the New York, Ontario & Western, presented statistics pertaining to the hard coal roads and their principal traffic and specifically asked that the unexpired order of the Commission in the big anthracite rate case, No. 4,914, be vacated and set aside so that the hard coal carriers may have the revenue to which they believe themselves entitled.

STATEMENT OF F. D. UNDERWOOD

"Agitation against increases in rates is largely manufactured for political or other selfish purposes," said Mr. Underwood. "The actual payer of rates is not here now and he never has been here. The question of rate increases is not one of law; neither does it demand extended oratorical efforts on the part of anyone. It narrows down to this: Are the railroads at this time to wither, and thereby fail to perform the physical functions demanded by inexorable conditions? Are the weaker ones to default on their interest payments, and the stronger ones to pass or cut their dividends, with the consequent effect on the financial fabric of the entire country?"

"The return on the property investment of the Erie Railroad was 2.88 per cent for the year ending June 30, 1917, as compared with 4.86 per cent in 1916. Upon that showing—which is the crux of all of it—it is vain to expect buyers for railroad securities. These results admit of no argument.

"The Erie Railroad asks an increase in rates sufficient to enable it to perform its duties to the public, pay the interest on its bonds, and have a proper surplus to meet emergencies. No percentage of rate increase that has been under consideration is adequate. If the railroads of the country are to continue to discharge their functions they can do it only through increased earnings, and the increase should not only deal with the present, but with the future, which holds unknown obstacles.

"The costs of materials, taxes, etc., are portrayed in our statement, but there is an element—the cost of unskilled transient labor to indispensable—which has to be met from day to day. The government contractors, private enterprises,

manufacturers, and even farmers have become competitors of the railways in the field of unskilled labor. Unskilled labor today is demanding and receiving wages in excess of those paid skilled labor two years ago.

"The railways must depend solely on unskilled labor for the care of locomotives and cars at terminals, for the handling of freight and materials, and for the removal of snow and ice in their season.

"It is not a healthy state of affairs for the Erie Railroad to earn \$83,900,000 in gross, and after exercising all possible economies—making parsimonious expenditures on the maintenance of the permanent roadway and equipment—to have a balance of only \$2,111,000 to apply to betterments and sinking funds. It is a dangerous thing from several standpoints for this small margin to continue. Statements showing the increased cost in maintenance of roadway and equipment are misleading. They show an increasing expenditure of dollars, but the dollar standard has been superseded for the reason that a dollar does not now buy its normal labor efficiency.

"There is no time to lose. The end of the next two months will be a trying period for many of the weaker lines. With the lessening and passing of dividends, and the probable defaults of interest, the investing public will set anew their face against railroad securities."

THE NEW ENGLAND ROADS

At the afternoon session J. H. Hustis and Howard Elliott made a general presentation for the New England carriers and in particular for the Boston & Maine and the New Haven. In summing up the case for the New Haven Mr. Elliott said:

"The New Haven is a great terminal yard for its many connections and promptness in handling cars will be of benefit not only to the New Haven but to all of its connections and to the railroad situation generally. With improved facilities and motive power, and with improved handling at terminals by railroad and shipper the present volume of business ought to be done with 5,000 less cars. This would make of greater use these cars, worth at present prices \$15,000,000.

"Railroad owners and managers should not be harassed during this war in attempting to curtail necessary expenditures for the purpose of keeping the property solvent but should be able to devote all of their time and energies to increasing efficiency. The rights of railroad security owners should also be protected so that they in turn will be relieved of anxiety on account of their investments and be able to devote their energies toward supporting the government both financially and in other ways.

"In the statement submitted May 7, 1917, we submitted estimates of increases in expenses, taxes and interest. In spite of some variations in particular items of expense, the total increase for the year will not vary much from the figures then submitted.

"The expenses of the New Haven company during the past nine months and its actual results compare with the estimates as follows: In arriving at the figures for 1917 the actual figures for the nine months are used and a close estimate for the remaining three months.

	Estimate of May 7	For year 1917
Adamson, law	\$1,400,000	\$1,353,000
Other wages	2,100,000	2,067,000
Fuel	4,000,000	2,580,000
Materials	4,000,000	3,600,000
Interest	500,000	219,000
Taxes	300,000	220,000
	\$12,300,000	\$10,039,000

Based on cumulative expenses due to further increases in wages and other costs, the comparison for 1918 with 1916 is estimated, as shown in the table in the next column, compared with maximum figures given in May.

"As against these increases the company has possible offsets as follows, if its petition for increased rates is granted

and if it can sustain its credit so that it can improve facilities and thus increase the volume of its business and at the same time continue to improve in its operating methods so as to

	Maximum estimates in May	Present estimates
Adamson law	\$1,600,000	\$1,353,000
Other wages	2,500,000	4,800,000
Coal	6,000,000	3,900,000
Materials	6,000,000	6,740,000
Interest	500,000	300,000
Taxes	400,000	575,000
	\$17,000,000	\$17,668,000

save more per unit of transportation than is possible with its present plant:

(1) Total additional revenue if full 15 per cent is granted.....	\$2,750,000
(2) Amended class rates.....	1,250,000
(3) Proposed increases in anthracite coal rates.....	300,000
(4) Proposed increases in passenger rates.....	3,700,000

Total estimated increase in revenue, provided business remains on or about the present volume..... \$8,000,000

"The total benefit from the increase in revenue as above plus the estimated savings for the calendar year 1917 due to better operation (estimated at \$4,000,000) is only \$1,961,000 more than the known increases in expenses for the year 1917. The same increased revenue as shown above and the benefit of these same economies for a full year (estimated at about \$5,000,000) would be \$4,668,000 less than the possible maximum increase in expenses in 1918.

"In conclusion the increases which we are asking for are intended for the following purposes:

"To meet increased expenses, to keep the road solvent, and prevent the danger of financial collapse involving as it will individuals, savings banks, insurance companies and other institutions. To keep the present plant up to a proper standard; to increase its capacity; to improve working conditions for employees and shippers and consignees in yards, stations, terminals and roundhouses, and thereby increase efficiency; to revive and restore the confidence of security holders, and to make a fair return on the fair value of the property devoted to the public use.

"The company if it can get this increased revenue must continue for some time to devote all income above its fixed charges and seven per cent on the proposed preferred stock (if the floating debt can be converted, to making the improvements so much needed for the welfare of the great population the company is serving. If the increased rates should result in a volume of net income greater than now seems possible and more than the commission thinks is just, they have the power to reduce the rates now suggested. Under war, transportation and financial conditions existing in New England and in the United States as a whole, the commission can well afford to lean in the direction of liberal treatment of this great transportation agency and grant all the increases in rates herein suggested."

STATEMENT OF RECEIVER HUSTIS

"A fifteen per cent advance in freight rates will not provide for the single item of increased payrolls on the Boston & Maine. Increased wages based on settlements already made and granted since January 1 will amount to about \$3,800,000 a year. There are now in course of arbitration wage demands which if granted will materially increase this amount.

"We are informed that the so-called 'Big Four' brotherhoods have also formulated demands, which if granted, would for that class of employees alone add at least \$1,500,000 additional to the pay roll expense. (From January 1 next.)

"While the action of the government in regulating the price of fuel, as well as the charter prices of the vessels that carry it, has performed a useful purpose, it has not materially relieved the New England situation.

"At government prices for coal and government prices for charter, and with fuel and vessels moving with despatch, the cost of fuel based on last year's consumption would be increased by at least \$4,700,000. In normal times fuel

makes up about 13 per cent of the operating expenses; for the present calendar year it will probably be as much as 20 per cent. . . . Steel bars, castings and plates are quoted at from 173 per cent to 400 per cent higher than last year. Lumber has increased 55 per cent. Material and supplies generally have been increased 64 per cent. Some of these prices are higher than those recently named by the government but it has been impossible thus far to obtain reasonable deliveries based on government prices.

"An inquiry recently made for the duplication of an order for sixty locomotives elicited the response that the tentative price would be in excess of 100 per cent over that of the locomotives delivered last winter. While deliveries of locomotives are not possible at the present time, yet they must soon be purchased and, if necessary, even at these high figures, if the present volume of business continues. . . . If the dictates of public opinion are to be followed; if the population and property of New England are to be protected from a foreign enemy in time of war; if the manufacturer, shipper, and consumer of New England and of the United States are to be furnished with proper railroad facilities, this increase now sought for is an absolute necessity."

STATEMENT OF SAMUEL REA

In only two previous years, 1903 and 1904, said Mr. Rea, was an increase in operating revenue followed by a decrease in the net. Such a condition, not corrected, would mean a collapse of the transportation facilities of the country in this hour of supreme National need. "We cannot afford to make any mistakes. It is not a time for panic, but neither is it a time for disregarding the facts of increasing expenses, of diminishing net operating income, of deferred maintenance, of lack of present facilities, and inability to provide future ones."

Mr. Rea thus summarized the salient factors:

"(a) Continuous increases in the cost of labor, fuel, supplies, taxes and of obtaining new capital;

"(b) Inability to secure and retain efficient labor;

"(c) Curtailment of maintenance expenses, which curtailment is due in part to inability to secure necessary labor and materials;

"(d) Decrease in net operating income, notwithstanding large increase in operating revenues, in property investment, in carload and in trainload;

"(e) Reduction in surplus with consequent effect upon the credit of the carriers;

"(f) Inability to secure new capital by the issue of stock, with the consequent weakening effect upon the financial structure;

"(g) Inability to provide improvements and facilities, not only essential for the traffic of today, but equally essential for the traffic of the future."

Declaring that the Pennsylvania Railroad system faces increased operating expenses of over \$74,000,000 a year, Mr. Rea attributed this to tremendous advances in the prices of labor, fuel and materials, as well as higher taxes. He presented the following summary of increased costs:—

Increased fuel costs.....	\$21,450,000
Increased materials costs.....	14,694,000
Increased wages under Adamson law.....	9,459,000
Increased wages to employees other than those affected by the Adamson Law.....	24,748,000
Increased taxes.....	3,870,000
Total	\$74,221,000

Mr. Rea reminded the commission that previous estimates of increased costs had proved far too low. He referred to the fact that his first estimate, presented to the commission on March 22, 1917, had placed the increased operating expenses of the Pennsylvania system at \$42,600,000 per year, whereas two months later it was necessary to revise this to \$51,892,000, and now, based on present conditions, this second estimate had been found too low by more than \$22,000,000.

Against the increased costs of \$74,221,000 per year now

confronting the Pennsylvania system, Mr. Rea estimated the increases in rates already granted at only \$30,000,000, and those pending in commodity rates at \$12,500,000 leaving an increase, unprovided for, of \$31,721,000 in the cost per annum of rendering transportation service.

That governmental price fixing on coal, in its present status, offers no prospect of lower fuel costs was indicated by Mr. Rea in his discussion of that subject.

"The railroads are going concerns," said Mr. Rea, "and must be operated and maintained upon a progressive basis. They are a vital factor in winning the war directly by the service rendered the government in the transportation of men and material and also by serving the shipper who is serving the government. If this transportation machine breaks down through inability to secure efficient labor by reason of inadequate wage rates it has a direct bearing upon the successful termination of the war."

"During the nine months ending September, 1917," he continued, "our total operating revenues have increased \$38,000,000 or 11.68 per cent, our operating expenses have increased \$47,000,000, or 20.53 per cent, while our net operating income has decreased \$13,380,000, or 17.09 per cent."

The government has recognized the increased cost of operation in manufacturing plants. The prices now fixed by the government give pig iron an advance of 105 per cent, bituminous coal 115 per cent, copper 68 per cent, and wheat 156 per cent.

"If this Commission takes the view of this situation which I hope it will, the result will be felt in the future financing of our improvements as it will give confidence to those furnishing such capital. If this Commission permits the rates of these carriers to be increased to such an extent as to return them adequate net operating income and maintains them upon such a basis the effect upon the financing of their needs will be very great and will tend to re-establish the confidence of investors."

STATEMENT OF A. H. SMITH

"We have been given five cents with which to pay an increase of 18 cents in expenses," said A. H. Smith, president of the New York Central. "It is of the utmost importance that these railroads be kept in good condition. They constitute the first line of communication with our armies. We may put ships on the ocean, construct railroads in Europe, and send our armies to the front, but we must not forget the great importance of maintaining in the very best of condition the first line of communication with our supplies and people."

"The financial strains put upon them through the rise in prices and wages are so great that they have been forced to do things which do not contribute to their strength and efficiency. The railroads cannot accomplish what the government itself has never been able to do—keep labor at pre-war wages and hold prices down to pre-war levels. A government may conscript capital and it may impress labor to carry on its work—an extreme measure to which we hope ours will not have to resort—but private corporations are powerless to do this and must compete in the markets for their capital, labor and supplies."

"We estimate that at the close of the current year the New York Central Lines will show that they have earned approximately \$93,000,000 more in gross revenues than they did in 1915; but the changes have been so great that they will have, after doing all this extra work, actually less net corporate income by several millions than they had in 1915."

"Our average train load and average car load has been increased greatly. We believe we have done all that we could with the means at hand. We have cut the service where that could be done; we have left undone things that should have been done, and we have taken on an extra heavy load without increasing the size of the plant. Obviously all of these resources have their limits."

Railway Regulation and Control

Joint Committee on Interstate Commerce Begins Hearing, Chairman Newlands Urges Constructive Policy

SAN FRANCISCO, Cal., November 6, 1917.

THE Congressional Joint Committee on Interstate Commerce, of which Senator Francis G. Newlands of Nevada is chairman, began a series of hearings at San Francisco on November 1, in its general inquiry into the problem of railway and public utility regulation, on which hearings were held at Washington last Winter and Spring.

Senator Newlands announced that the committee desired particularly to hear from state commissioners, representatives of shippers and others of the Pacific Coast and intermountain sections with reference either to the general problem or to local problems bearing on the subject of the inquiry. Max Thelen, president of the California Railway Commission and representing the legislative committee of the National Association of Railway and Utilities Commissioners, was the first witness, being recalled for cross-examination on his testimony at the Washington hearing.

CHAIRMAN NEWLANDS' ADDRESS

The problem confronting the committee was outlined by Chairman Newlands in an address at a luncheon for the committee given by the San Francisco Chamber of Commerce and the San Francisco Commercial Club in which he said in part:

"Transportation is the great economic question of the day, surpassing everything else in point of importance at this time, for adequate transportation stands at the base of a successful prosecution of this war and it will stand at the base of a proper development of commerce after the war has ended. We all know and believe that the United States has the best railway system in the world but few of us pause to realize the energy and the genius of the Americans who led in this great work and developed it to its present phenomenal standard. The work was entirely trusted to private enterprise. The public hardly claimed the right to interfere with it or in any way to endeavor to regulate it. Therefore, naturally, great abuses arose, which it was necessary to correct and the American people took hold of that question with the vigor which usually characterizes them. For years they have been engaged in corrective and punitive legislation and regulation of railways and have formed a habit of mind which is punitive and corrective.

"The President of the United States has now called our attention to the fact that it is important that we should again enter upon a constructive era, realizing that almost everything has been done that could have been done in the way of punitive and corrective legislation and that we have the administrative power which is necessary to correct any evils that may now exist or arise in the future.

"When this war broke out we realized for the first time that the railway facilities of this country, enormous as they were, were not adequate to the emergency which we had to encounter. They were, perhaps, adequate to the normal requirements of the country, but they were not adequate to the enormous and abnormal demands that were thrown upon them as the result of the war.

"As a result of the period of depression existing before the war the railways were in distress as to their income and they started to practice economies which, as experience has since shown, while entirely wise as far as the internal conditions of the railroads were concerned, were not wise as far as satisfying the demands of the country in general.

"That is why I am making an appeal to this entire country to stand by and sustain a constructive policy regarding the

railroads, not so much that the bondholders and stockholders may earn interest and dividends on their investments, but for the principal reason that the public interests absolutely require that these great public agencies should be fully developed and that we all should act in such a way as to encourage private capital in enlarging these facilities throughout the country.

"The war made such demands upon the transportation facilities of this country that car shortage and coal shortage and high prices have been the result. These skyrocket prices which have vastly increased the cost of living may be traced to a large degree to the enforced economies of the period before the war.

"We ought to have foreseen such conditions, but now, in order to accomplish anything, we have got to get out of the punitive and correctional habit of mind. Congress, I regret to say, is still in that habit of mind because the public is, for Congress doesn't lead public opinion; Congress follows public opinion. This does not mean at all an abandonment of the advantages which have been gained in the period through which we have passed. There is no danger of our lapsing into the old conditions, where such serious abuses existed as to arouse the resentment and indignation of the entire public. All I suggest is that the public should rid itself of the influence that these abuses have had upon its mind and help the railroads to regain the markets of the world for their loans and their securities; markets which are not open to them now, partly because railway securities are not the safest securities they once were and partly because the government is now monopolizing the financial markets.

"There are three ways of furnishing these railways with aid to bring them out of their deplorable state. One is a more liberal policy on the part of the government and the public that will satisfy the investing public. Another is national aid, furnishing from the public chest money to assist in meeting the public needs. A third way is to increase the rates of the railroads. I don't pretend to suggest the method, but I wish to call your attention to the need of meeting this question satisfactorily, and it will devolve upon this committee largely to suggest the method."

TESTIMONY

Among those who entered appearances to indicate their intention of testifying before the committee were: F. A. Jones, chairman of the Arizona Corporation Commission; W. S. McCarthy, of the Traffic Bureau of Utah; Seth Mann, of the San Francisco Chamber of Commerce; Fred P. Griggs, of the traffic department of the Associated Jobbers of Los Angeles; G. J. Bradley, representing commercial interests of Sacramento; F. M. Hill, of the Fresno Traffic Association; S. J. Wetrick, of Seattle; L. R. Bishop, of the Oakland Chamber of Commerce; J. C. Summers, of the Stockton Chamber of Commerce, and E. P. Troy, of the Public Ownership Association. Most of these said they wished to discuss the long and short haul clause in its relation to the rates to the Pacific Coast and the intermountain territory.

Mr. Thelen, questioned by Senator Cummins, said that his opposition to the plan of federal incorporation of railways was based on the fact that the plan is proposed by the railways merely as an agency for taking away from the states the power of taxation and the police power as well as the power to regulate rates. When a plan for federal

incorporation is presented to Congress, he said, it will be easier to take away these powers of the states by a few words in the law than it would be to do so by more direct methods.

Alfred P. Thom, counsel for the Railway Executives' Advisory Committee, entered a protest against this statement of the railroads' attitude, saying that they have no such idea; that they have proposed that the power of taxation and the police powers be reserved to the states under federal charters just as the power of taxation of national banks was left to the states.

Mr. Thelen's cross-examination was continued by Representative Sims and Senator Newlands on Friday. Representative Sims asked if the present system of taxation by states does not cause inequalities resulting in discrimination by a state against interstate commerce. Mr. Thelen admitted that there were inequalities but said they could be corrected by the federal government without federal incorporation.

Senator Newlands asked if the legislative committee of the National Association of Railway and Utilities Commissioners had reached any conclusion as to federal incorporation. Mr. Thelen replied that they are practically unanimous in opposing the plan proposed by the railroads but this does not necessarily apply to any other plan, such as a plan for turning over the property of the railroads to new corporations at a fair value. The railroad proposal contemplates an exchange of the present securities. He said that the majority of state commissioners are in favor of federal regulation of security issues. The states, he said, have gone into this field because the federal government has not, but he recognized that the states cannot adequately supervise the issue of securities of railroads chartered in other states and that embarrassments and delays result from the necessity of securing the consent of several states. It is important, he said, that such matters should be passed on promptly and the Interstate Commerce Commission should be provided with sufficient machinery to enable it to decide such cases promptly.

As to many of the functions exercised by the states, such as regulation of stations, crossings, investigations of accidents, etc., he thought that the state commissions can better protect the interests of the public than the federal government can, but there are many cases where the states can helpfully co-operate with the federal commission. He thought that the federal government might well establish a uniform method of taxation, to be followed by the states, while leaving the actual taxing power in the states. To this Senator Newlands assented. Mr. Thelen also said that the government should do something to prevent unnecessary duplication of facilities but the question of jurisdiction should depend on the character of the facilities involved.

There has been very little difficulty in California, he said, as a result of conflict between state and interstate rates, but he recognized that the existence of such situations as are involved in the Shreveport case are very unfortunate and that some steps should be taken to remedy them. With this change he thought the principal objection to the dual system would be eliminated and the national association had instructed the committee to confer with the Interstate Commerce Commission on a plan for reconciling conflicts of jurisdiction by joint hearings on a single record with an endeavor to reach a harmonious conclusion. The ultimate jurisdiction, he said, would be in the federal government.

Mr. Thelen gave some figures showing the percentage of state to interstate traffic on some of the principal roads of California. In the case of the Atchison, Topeka & Santa Fe, he said, 44.1 per cent of its California business is intrastate, while for other roads the percentages were: Southern Pacific, 56.9; Western Pacific, 27.6; and Los Angeles & Salt Lake, 24.4.

Questioned by Representative Esch regarding receiverships Mr. Thelen said that the federal charters of the Union Pacific and of the Texas & Pacific had not kept them from receiverships. He said it would be very desirable if the federal government would work out a constructive plan for dealing with receiverships and he was in favor of the Interstate Commerce Commission itself acting as a receiver. The stock and bond expert of the California commission has compiled an elaborate analysis of the causes of the receiverships of the principal roads that have become bankrupt, to be filed with the committee. Mr. Esch asked if a federal statute against trespassing would not be advisable in view of the fact that the states have not acted. Mr. Thelen assented to this and said the grade crossing committee of the national association had recommended such a statute although no action was taken on the report by the association. He said he would favor a modification of the anti-pooling and anti-trust laws to such an extent as to prevent wasteful duplication of facilities and thought the Interstate Commerce Commission might issue certificates of public necessity.

Senator Cummins led the witness into a discussion of the problem created by the existence of weak roads that cannot survive on rates which may be profitable to their stronger competitors. This, Mr. Thelen said, constituted the heart of the railroad problem and offered an opportunity for a constructive plan. He did not think the plan proposed by the railroads was a constructive one, but when Senator Cummins suggested that here was his opportunity to be constructive he had no plan to offer. He thought the plan of having the government subsidize the weak roads was impracticable but that there was some merit in the plan suggested by Senator Cummins for grouping the railroads in such a way that the strong roads should absorb the weaker lines.

A STATE COMMISSIONER WHO FAVORS FEDERAL REGULATION

A marked contrast to Mr. Thelen's ideas was presented by the testimony of E. O. Edgerton, of the California Commission, who followed him. Mr. Edgerton said he was in favor of complete and immediate federal control of railroads, starting with railroad service, because a situation in one state cannot be adequately considered except in its relation to other states and state commissions are concerned only with their own states. When the California commission ordered the Santa Fe to build a new line, although he believed their action was right, he said it had considered the case only from the standpoint of California without knowing what effect it would have on the ability of the road to serve other states, and when more cars are needed the state commission is naturally vigorous in trying to get them, perhaps at the expense of other states.

"Rates in one state are intimately connected with the rates in other states and also with the finances of the carrier," he said. "We can't fix rates in one state without to some extent affecting the ability of the roads to give service in another state and in interstate commerce. It is not right that one state should receive lower rates for like service than another state. The federal government not only should have the authority to regulate the issuance of securities but it should have control of the expenditure of the proceeds, and the authority that has the power to regulate the capitalization and finances should also have the power to say what the rates shall be."

"We have no national railway policy," Mr. Edgerton continued. "The railroads of the United States have been laid out without reference to the military needs of the country. One cabinet officer is pressing in the federal courts to tear apart a great railroad system, the Central Pacific and the Southern Pacific, that have always been operated as one system, while other cabinet officers are insisting on the rail-

roads being operated as a unit, to do the job we have in hand. The railroad system has broken down, at least to the extent that it cannot meet all the demands made upon it. For years past the railroads have been calling attention to the need for increased facilities to meet the needs of the country and now we see that they were right.

"To me the problem seems to be this: There is a national job to be done. The job is not being done. We have been proceeding with private ownership under regulation. Instead of overregulating the roads they have not been sufficiently regulated. The only chance for private ownership is affirmative and constructive regulation, not the exercise of veto power. Fixing rates in such a way as to get by the courts, just escaping the line of confiscation, is not intelligent regulation. We need the kind of regulation that compels the development of railroads to meet the national needs. Either private ownership under regulation must do the job we have before us or the government must. I suggest that we give over at once the discussion of the merits or demerits of government ownership, consider and formulate the needs of the country, put the job up to the railroads and ask their terms. If the terms are prohibitive let the government take the job itself."

Asked for his views as to the function of the state commissions under a plan of federal regulation, Mr. Edgerton said they would be left the vast field of public utility regulation but as to railroads they should serve in an advisory capacity only, appearing before the Interstate Commerce Commission frankly as partisans for their state instead of trying to act both as partisans and in a judicial capacity.

He did not believe effective results can be secured from the proposed plan for co-operation between state and federal commissions in cases involving conflicts of jurisdiction. "Co-operation is all right when the parties are agreed," he said, "but co-operation gets you nowhere in controversial matters unless one party has a club. Otherwise the only result can be a compromise. Situations like that in the Shreveport case should be settled by the Interstate Commerce Commission."

On Monday William Gardner, of the Reno Commercial Club, criticised the railroads and the Interstate Commerce Commission for discriminating against the intermountain country. He was followed by members of the Railroad Commission of Nevada and Spokane commercial interests.

On Tuesday W. F. McCarty, of the Utah Traffic Bureau, testified. H. M. Wade, of the Oakland Chamber of Commerce, defended the present system.

It is expected that the hearings will close this week.

DENVER TOURIST AND PUBLICITY BUREAU

In the past the railroads have had to depend largely on themselves for the creation of new tourist traffic. The Tourist and Publicity Bureau of the Denver (Colo.) Civic and Commercial Association is noteworthy in that it represents the organized and successful effort of a city to attract passenger travel. The bureau is supported by contributions from merchants and manufacturers of Denver. For the past two years it has achieved substantial results under the direction of its executive secretary, Harry N. Burhans, an experienced publicity man. Its work includes systematic advertising in newspapers and magazines likely to reach prospective tourists, the distribution of literature describing the scenic attractions of the territory tributary to Denver, the preparation of press stories on the natural wonders of the region and the operation of branch offices for the convenience and information of the public at other cities.

The publications which carry bureau advertisements were uniformly selected with the idea of achieving a maximum return. A school journal reaching thousands of the teaching profession, well known as more addicted to travel than any other class of our population, has been exceptionally productive of results. According to a railroad publicity

representative who is familiar with the work of the Denver organization, like advertisements by the bureau and the railroad in the same mediums bring twice as many inquiries to the bureau as to the carrier. He attributes this fact to the less evident pecuniary motive of the Denver organization in encouraging travel.

In a like manner the bureau has been able to "put over" press stories in national magazines which would not consider accepting similar articles from a railroad. By way of illustration, Mr. Burhans sometime ago engaged the services of a high-class Denver photographer and several professional posers for the purpose of securing scenic views with a little life in them. With some pictures taken in this way in Estes Park and a descriptive article on its natural beauties he approached the editor of one of the foremost American monthlies, to whom he offered the exclusive privilege to use them free of charge. The editor accepted the proposition and the bureau obtained the best publicity it had ever secured. In a similar manner the bureau has published a series of folders, copiously illustrated with photographs of Colorado scenes, some of which are in colors. These pamphlets have been placed in the lobbies of hotels and in the offices of many industries and commercial houses to which similar literature prepared by railroads cannot gain entree.

A folder, recently issued and entitled "Come Up to Colorado," contains a full-page map of the United States, showing the distances of the large cities of the East and Middle West to Denver and the distances from that city to the various points of interest to tourists in the West. The map is an ingenious argument for Denver's claim for recognition as the "gateway to 12 national parks and 32 national monuments." The last eight pages of the folder are devoted to detailed information concerning accommodations for visitors in Denver and Colorado resorts, suggestions as to how to "see Denver" either by trolley or automobile, instructions regarding the best highways for motorists to use to reach the city from the different directions, a detailed map of the Denver business district and a railway and road map of the state.

The bureau has three branch offices, the first of which was opened at Colorado Springs, Colo., the first stop of a large stream of tourists from Texas, Oklahoma and Kansas. The object of this office, obviously, was to encourage travelers to extend their itineraries to include Denver and other Colorado points. A second branch was established at Kansas City and a third at Chicago. The opening of each office has been accompanied by an aggressive advertising campaign in the newspapers for the purpose of securing an initial clientele. Those in charge of the branches have rapidly built up acquaintanceships among prospective tourists and supplied them with concrete information relative to the attractions of Denver and Colorado and the expense involved in taking various western tours. As no preference is urged for any of the railroads serving that territory the traveling public has not shown a disposition to discount the bureau's representations as designed to produce maximum passenger mileage.

The tourist offices have increased their usefulness and the effectiveness of their work by keeping constantly in touch with commercial, agricultural and trade opportunities in Denver and contiguous territory. From chambers of commerce and other sources in Colorado detailed advice concerning openings for merchants, manufacturers and farmers are received. Consequently, it is not infrequently the case that a visit to a bureau office brings a permanent resident to the Rocky Mountain state. Likewise, many on pleasure tours are so impressed with the desirability of Colorado as a place of residence that they take advantage of the business and agricultural opportunities concerning which the bureau is able to furnish them concrete data.

General News Department

The New York Central now maintains schools for teaching telegraphy and other station work at Albany, Utica, Rochester, Corning and Kingston.

By a fire of unknown origin the freight house of the Lehigh Valley at Phillipsburg, N. J., was destroyed on November 2, together with ten loaded freight cars and a flour warehouse adjacent; total estimated loss, \$200,000.

The Canadian Pacific, following the report of a Board of Conciliation, has advanced the pay of trackmen 30 cents a day on the western lines and 40 cents a day on the eastern lines. Foremen are advanced 15 cents a day to \$3.25, \$3.40 and \$3.60.

Carl Scholz, consulting mining engineer of the Chicago, Burlington & Quincy at Chicago, has been appointed a member of the Committee of Consulting Engineers on Coal Conservation and Publicity, for the Bureau of Mines, Washington, D. C.

The freight handlers of Chicago are demanding a twenty per cent increase in pay and have presented their claims to the Rock Island, the St. Paul, the Michigan Central, the Illinois Central, the Baltimore & Ohio Chicago Terminal, the Pere Marquette, the Chicago Great Western and the Chicago, Indianapolis & Louisville.

Most or all of the striking telegraphers on the northern division of the Pennsylvania Railroad have returned to work. It is said that they have the benefit of the general advance of 25 per cent in wages which has been granted by the road to its telegraphers; but the train dispatchers on the Northern division have not been taken back.

A compilation of state regulations regarding the housing of railroad employees, prepared by the Bureau of Railway Economics, shows that eight states—Arkansas, Kansas, Mississippi, North Carolina, Oklahoma, Oregon, South Carolina and Texas—have laws requiring railroads to maintain sheds over tracks where car repair work is regularly carried on.

On the Atchison, Topeka & Santa Fe lines east of Albuquerque, N. M., increases in pay have been granted to station employees, telegraph operators and clerical forces in the offices of superintendents, master mechanics, general superintendents and mechanical superintendents, effective October 15. The advances granted will add about \$410,000 per year to the company's payroll.

The Grand Trunk Railway of Canada has made a general advance in the pay of locomotive enginemen and firemen, following negotiations which have extended over two months. The eight-hour day is adopted, the same as in the United States. On engines of moderate size, the runners receive an advance of 10 cents a hundred miles; on the Pacific type, 20 cents a hundred miles. Firemen, on engines having 18-inch cylinders, are advanced 20 cents; on 19-inch cylinders, 15 cents, and on Pacific type, 15 cents, the latter from \$2.70 to \$2.85.

Passengers Killed by Mexican Bandits

A press despatch of November 6 reports that a northbound passenger train of the Mexican Central was dynamited and wrecked near Armendariz, 50 miles south of Chihuahua, on November 4. It is said that 40 federal train guards were killed, and that the passengers were robbed and some of them killed.

Alien Railway Employees Prove Loyalty

According to H. E. R. Wood, assistant secretary and assistant treasurer of the Chicago & Alton, 154 out of 160 men of foreign birth employed in the Chicago freight houses of the Alton bought Second Liberty Loan bonds to the amount of \$8,800. One Italian laborer mortgaged his home for \$1,000, on which he must pay 6 per cent interest, in order to buy a \$1,000 Liberty Loan bond. Greeks form the largest percentage of the alien employees who bought bonds, but the list also includes Germans, Austrians, Italians, Poles, Bohemians and other nationalities.

Reports to a committee of the Railroads' War Board show that on 21 railroads entering Chicago 63,000 employees subscribed \$5,341,000 to the First Liberty Loan. The subscriptions by railway employees to the Second Liberty Loan have not yet been compiled but it is estimated that they were more than three times as large as to the first loan.

Firemen to Demand Wage Raise

Locomotive firemen are preparing to launch a nation-wide campaign for higher wages. The eastern association, comprising employees of all roads east of Chicago and north of and including the Chesapeake & Ohio, held a meeting in Cleveland, Ohio, on November 5, to discuss the proposed demands, and the western and southern association will meet within a few weeks.

Railway Regiments' Smoke Fund

The railway supply companies have added \$60 a month more to the Railway Regiments & Tobacco Fund, subscriptions having been received since October 31 from the following companies:

Anti-Creeper Corporation, New York.....	\$10 a month
Carnegie Steel Company, Pittsburgh, Pa.....	10 a month
Crucible Steel Company of America, Chicago.....	10 a month
Damascus Bronze Company, Pittsburgh, Pa.....	10 a month
Waterbury Battery Company, Waterbury, Conn.....	10 a month
Western Railway Equipment Company, St. Louis, Mo.....	10 a month

The subscribers now total 58, the previous subscribers being given in the *Railway Age Gazette* of October 26, page 753, and November 2, page 810.

New York Port War Board

The secretary of war announces the appointment of a board, consisting of officers of the government acting with the commission recently appointed on the part of the states of New York and New Jersey, to co-ordinate all harbor and terminal facilities with special reference to the transportation of men and materials across the ocean. The chairman is the secretary of the treasury and the vice-chairman is William R. Wilcox, chairman of the New York-New Jersey Port Development Commission. Three other members of the cabinet and the mayor of New York City are members. The chief executive officer is Irving T. Bush, president of the Bush Terminal Company, operating extensive docks and warehouses in South Brooklyn, New York City. It is understood that Mr. Bush will have a free hand in the matter of controlling all storage and shipping facilities of the port of New York, and that railroad, terminal and lighterage interests will be able to co-operate with greatly increased efficiency in the relief of congestion.

\$19,000,000 in Liberty Bonds for the Pennsylvania System

Returns which have been compiled from all portions of the Pennsylvania Railroad System, including the Lines East and West of Pittsburgh, show that a total of 122,456 employees subscribed to the Second Liberty Loan, taking altogether \$9,051,700.

On the Lines East of Pittsburgh 77,273 individual subscriptions were recorded for a total of \$5,689,700. On the Lines West, 45,183 employees subscribed for \$3,362,000 worth of bonds.

As the Pennsylvania Railroad Company, the parent corporation of the system subscribed on its own account, for \$10,000,000 of the Second Liberty Loan, the total subscriptions for the company and for the employees of the system, amount to \$19,051,700.

An analysis of the subscriptions on the Lines East of Pittsburgh shows that the great bulk of the money was subscribed in small, or comparatively small amounts. Out of the total 77,273 subscriptions, only 88 were for more than \$1,000 each. Payment in full was made by 3,471 employees of the Lines East, while 71,802 subscribed under the installment plan, by which they

will save the price of the bonds out of their future wages, making payment in the ten-month period ending August 15 next.

The campaign for subscriptions among the employees of the entire Pennsylvania system was carried on with the greatest vigor and enthusiasm. Local Liberty Loan committees were organized on all divisions, and in all shops and departments. Nearly 2,000 men were actively engaged in the work of solicitation, and every one of the quarter-million employees of the system was personally urged to "buy a bond."

Christmas Boxes for France

Uncle Sam is determined that all his nephews fighting in France shall have as big Christmas boxes as relatives and friends here want to send them—up to 20 lb.—if mailed early enough. The French government, because of inadequate rail facilities, cannot carry parcel-post packages weighing over 7 lb.; but the United States War Department announces that it will take Christmas packages for the American expeditionary forces in France, and carry them over the lines there which have been built and are being operated by our nine railway regiments. The Post Office Department directs that Christmas packages (not over 20 lb. each) be sent in care of the Commanding General, at Pier J, Hoboken, N. J. Articles must be packed in a wooden box not more than two cubic feet in extent, well strapped, and with either a hinged or a screwed top. No perishable foodstuffs may be sent. The box should be marked to indicate it is a Christmas package, and should reach Hoboken not later than December 5. The rate of postage is 12 cents a pound.

Conductors and Trainmen to Ask Wage Increase

New wage scales for 200,000 members of the Brotherhood of Railroad Trainmen and the Order of Railway Conductors were agreed upon unanimously at a conference of the officers and committee chairmen of these two brotherhoods at Chicago, concluded on November 6. These demands will be presented to all railroads about December 1. On passenger runs of 155 miles or less per day they will ask for not less than \$5.43 per day or \$162.90 per month for conductors; \$4.65 per day or \$139.50 per month for ticket collectors; \$4.50 per day or \$135.00 per month for baggage electricians; \$3.88 per day or \$116.40 per month for baggage-men; \$3.61 per day or \$108.30 per month for flagmen and brakemen. Overtime is to be calculated at one-eighth of the day rate per hour. Passenger runs on short turn around, not to exceed 80 miles, shall be paid overtime for all time on duty or held for duty in excess of eight hours within ten consecutive hours. Passenger brakemen who do not lie off of their own accord shall receive a monthly guarantee.

Through and irregular freight, snow plow and circus trains: Conductors, \$5.30 per day; flagmen and brakemen, \$3.81 per day.

Local, way freight, mixed, pickup or drop, mine, roustabout, pusher or helper, wreck and construction service: Conductors, \$5.80 per day; flagmen, \$4.29 per day.

Yard service: Foremen, days, \$5.30; night, \$5.50; helpers, days, \$5.00; night, \$5.20.

All rates in freight and yard service are for eight hours or less, 100 miles or less; overtime pro rata.

It Is Never Too Late to Mend

John Skelton Williams, controller of the currency, has made the following statement: "When the railroads shall have laid frankly before the commission the facts and figures which will show so conclusively the extent to which the rates now in force are insufficient to maintain the credit of the roads and to enable them to perform efficiently their public functions under the present unusual and extraordinary conditions, we have no right to doubt that the decision which the commission will reach will be one which its superior knowledge and painstaking study of the whole situation will in every way justify, and that the relief needed will be promptly accorded.

"If a way cannot be found now to reduce promptly the prices of materials and the cost of labor to a normal basis, and this, for the present, is hopeless, it seems clear, on the facts before us, that a revision and modification of the fabric of rates to meet the new conditions have become imperative.

"If the relief which is manifestly required at this time is granted, I believe that confidence in our railroad securities will be revived and a basis established for new financing and for pro-

ceeding with new development and construction work, which is now so greatly needed. The beneficent influence and effect of such action would be felt instantly throughout the entire country."

National Railway Appliances Association Exhibit

The success of the exhibit of the National Railway Appliances Association, which will be held in the Coliseum and Annex, Chicago, on March 18 to 21, 1918, is now assured, applications for 225 spaces having been received up to November 1. The total number of spaces available at the exhibit last year was 234. By rearrangement of the floor plan to accommodate a larger number of exhibitors, 30 additional spaces have been provided this year, making a total of 264 spaces, which will be available.

Car Foremen's Association of Chicago

The next monthly meeting of the Car Foremen's Association of Chicago will be held at the Hotel Morrison on Monday, November 12. A paper on Wood and Steel Car Construction will be presented by H. S. Sackett, timber engineer of the Chicago, Milwaukee & St. Paul.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

- AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 20 W. 57th St., New York.
- AMERICAN WOOD PRESERVATION ASSOCIATION.—F. J. Angier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January, 1918, Chicago.
- ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—W. L. Connelly, Superintendent of Telegraph, Ind. Harb. Belt, Gibson, Ind. Next meeting, November 22, La Salle Hotel, Chicago.
- CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal). One. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.
- CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 174 Mansfield St., Montreal, One. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.
- CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Morrison Hotel, Chicago.
- CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.
- CINCINNATI RAILWAY CLUB.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carey Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.
- ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 568 Union Arcade Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.
- GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.
- INVESTMENT BANKERS' ASSOCIATION OF AMERICA.—Frederick R. Fenton, 11 W. Monroe St., Chicago. Next annual convention, November 12-14, Hotel Belvedere, Baltimore, Md.
- NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.
- NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 35th St., New York.
- NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Geo. A. J. Hochgrebe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.
- PACIFIC RAILWAY CLUB.—W. S. Wolfner, Assistant to Chief Engineer, Northwestern Pacific R. R., San Francisco, Cal.
- PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.
- RAILWAY CLUB OF PITTSBURGH.—J. R. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial Annex Hotel, Pittsburgh.
- RICHMOND RAILROAD CLUB.—O. Robinson, C. & O., Richmond, Va. Club has been suspended until after the war.
- ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.
- SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.
- TRAFFIC CLUB OF CHICAGO.—C. B. Singer, La Salle Hotel, Chicago.
- TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, 1st Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.
- WESTERN CANADIAN CLUB.—L. Karl, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.
- WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpis Bldg., Chicago. Regular meetings, 1st Monday in month, except June, July and August, Hotel Sherman, Chicago.
- WESTERN SOCIETY OF ENGINEERS.—Edgar S. Nethercut, Secretary, 1735 Monadhuck Block, Chicago, Ill. Regular meeting, first Monday in month, except January, July and August. Extra meetings generally on third Monday evenings except in July and August.

Traffic News

The Public Utilities Commission of Ohio recently granted an application by the railroads for authority to continue until May 1, 1918, intrastate demurrage rates which expired on November 1.

The Railroad Commission of Louisiana in a decision rendered on October 23, denied the application of the railroads in that state for an advance of 15 cents a ton in coal and coke freight rates.

The Lehigh Valley and the New York, New Haven & Hartford have established a joint embargo committee, with headquarters at New Haven. Richard Hackett, assistant to the senior vice-president of the New Haven, is chairman.

The mayor of Providence, R. I., has asked Judge Lovett to suspend for 30 days his order forbidding the use of coal cars for the transportation of gravel and other road material, five important highway improvements in that city having been begun and being now unfinished.

According to estimates made at Columbus on October 31 the number of cars of coal shipped to Ohio points on the day fixed by the Priority Board, when that State was to have all of the shipments of all of the mines tributary to the state, was 3,000.

The Fruit and Vegetable Transportation Association of the South and East has issued a circular appealing to growers, shippers and receivers to do away with the great waste, everywhere evident, in getting fruits and vegetables to the markets. This waste is deplorable at any time, but it is more so at this time in the face of our patriotic duty. Everybody can help by using stronger containers, strong enough to carry the goods to destination safely; by carefully selecting and packing fruits and vegetables so that they will not deteriorate before reaching market, and by plainly marking each package l. c. l. shipments.

Large Coal Movement by Railroads

The Railroads' War Board has received reports indicating that the efforts of the railroads and coal shippers to prevent the threatened coal shortage in the Northwest during the coming winter have been more successful than seemed possible during the summer. With five weeks or more left before the close of navigation on the great lakes 23,348,100 of the 29,000,000 tons which it was estimated will be required, have already been sent to the Northwest.

The Commission on Car Service is now directing efforts to the work of insuring an adequate coal supply for domestic and industrial uses of coal in all other sections of the country. While a greater supply of coal has been mined and shipped than ever before the difficulty today is that the consumption all over the country is greater than ever before.

Priority for Coal from Mines in Wyoming and Utah

Robert S. Lovett, administrative officer under the provision of the priority shipments act, has issued priority order No. 3, directing railroads serving coal mines in the Utah and Wyoming coal fields to give priority rights on coal to the section of the country west and northwest of these fields. The order applies to the Denver & Rio Grande, the Los Angeles & Salt Lake, the Utah Railway, the Union Pacific, the Oregon Short Line, the Southern Pacific and the Western Pacific. These roads are directed to supply daily to the lines in the Utah and Wyoming coal fields all or so many of the empty box and single-deck stock cars moving west or northwest over their lines as may be required to transport coal ready for shipment west or northwest, according to the direction in which such cars are being moved. All cars of every kind loaded with commercial coal and destined to points west and northwest of point of shipment shall have preference in shipment, after transporting (a) railroad fuel supply; (b) live stock and perishable freight, including sugar beets; (c) Government shipments; and (d) commodities to and from smelting plants sufficient to keep same in operation.

In another order, designated Supplement B to priority order No. 1, Judge Lovett orders the cancellation of Priority Order No. 1 dealing with the transportation of bituminous coal for transshipment by vessel to ports on Lake Superior and Lake Michigan, effective November 1.

General Travel Conditions

All passenger transportation facilities report unusual business and a continuation of capacity passenger traffic is predicted; not alone on American railways, but on all available Transatlantic and Transpacific passenger carrying steamers. This business is almost altogether commercial and military; very little of it is tourist traffic. There is a general feeling, however, that with the second liberty loan out of the way and the new National Army settled in its routine of training and camp life, there will be at least a normal, if not an unusual tourist traffic to Florida, Gulf Points, and Southern California. California expects one of its biggest seasons. The hotels have made arrangements for better accommodation and more rooms. The national park tourist season which has just closed has been an unprecedented one, and the great increase in the number of visitors to the parks has not been a mere increase in local travel. There has been a marked increase in the number of eastern travelers in all of the great national play-grounds of the West. The Department of the Interior looks forward confidently to a still heavier travel in the season of 1918; and also, at present, is planning to entertain people in the parks where winter sports are being developed during the coming winter in larger numbers than ever before. Ski courses will be constructed in Rocky Mountain National Park, and perhaps in the Yosemite Valley. Both of these parks are accessible throughout the winter.—*American Express Co.'s Travel Bulletin.*

Council of National Defense Asks State Co-operation for Car Efficiency

The Council of National Defense, section of co-operation with states, has addressed a bulletin to the state councils of defense asking "Will you help increase the efficiency of the transportation agencies?"

The bulletin quotes the suggestions made by the Committee on Car Service relative to freight car efficiency and then continues:

"The state councils of defense can render a valuable and patriotic service by endeavoring to procure compliance with those suggested regulations on the part of all those who ship or receive freight. Your local organizations should be instructed concerning the importance of transportation of all kinds in the present emergency, and they should be asked to report to you cases which come to their attention and which they are unable to correct, where shippers fail to comply with the spirit of these regulations. If it should develop that any shipper or receiver of freight is delinquent, it is suggested that the matter be brought to his attention by means of a post card, urging his compliance as a patriotic duty, and if the matter can not be corrected in that manner that some member of your council or the local organization visit him personally and endeavor to explain the importance at this time of conserving all transportation agencies as much as possible. It should be kept in mind that the industrial activity of the country today exceeds that of any former period, and that conditions created by the war have resulted in the withdrawal of many transportation agencies from their normal and usual activities.

"This makes it necessary that the fullest possible use should be made of all transportation agencies, including not only the steam railroad, which is of course the most important, but such other agencies as the motor truck, the electric lines, and the waterways. Every possible effort should be made to obtain the maximum use of all of these agencies and in such way as will contribute most to the public good.

"The commission on car service of the railroads' special committee on national defense has created local committees in 80 cities. Your committees can doubtless work to best advantage in co-operation with such of the railroads' committees as are established in your State."

The bulletin is dated November 1 and is signed by W. S. Gifford, director, and George L. Porter, chief of section.

Commission and Court News

PERSONNEL OF COMMISSIONS

Oliver H. Hughes, chairman of the public utilities commission of Ohio, died at Columbus, on October 28, at the age of 52.

COURT NEWS

Railroad May Attack Interstate Commerce Commission's Awards as to Discrimination

The Circuit Court of Appeals, Third Circuit, holds that an award by the Interstate Commerce Commission in favor of a shipper on account of discrimination in furnishing cars is only prima facie evidence of the amount of the damages, and in an action thereon the railroad may attack the amount. If the evidence shows that the award is incorrect, the jury should follow the evidence and reject the award. The court stated that it did not decide the question whether a plaintiff can recover more than the commission awards, but undoubtedly the railroad may prove that the sum is too large.—*Pennsylvania vs. Minks*, 244 Fed. 53. Rehearing denied October 8, 1917.

Danger of Swaying Cars at Curves and Grades Assumed by Passengers

A female passenger was being shown to another seat by the conductor when she was thrown to the floor of the aisle by a sudden lurch of the car as it rounded a sharp curve. In an action for her injuries the Circuit Court of Appeals, Fourth Circuit, reversed a judgment of the district court for the Southern District of West Virginia in favor of the plaintiff, holding that swaying or lurching of cars necessarily incident to proper operation of fast passenger trains at curves in the track, necessary because of the nature of the [mountainous] country, whereby a passenger is injured, does not charge the railroad with negligence. The risk thereof is assumed by the passenger.—*Chesapeake & Ohio vs. Needham*, 244 Fed. 146. Decided July 5, 1917.

Contributory Negligence of Automobile Passenger

In an action against a railroad for personal injuries it appeared that the plaintiff and six others were taking a pleasure ride in an automobile, when it struck the side of a train at a grade crossing, killing some and injuring others of the riders. The plaintiff knew they were approaching a crossing, and was sitting on the knee of another of the party on the front seat beside the driver. The view of the track was obstructed by a building until they were within 15 feet of it, when it could be seen for 2,000 feet. The Circuit Court of Appeals, Third Circuit, held that it was as much the duty of the plaintiff as of the driver to look out for the train and give warning of its approach, and that under the undisputed facts she was chargeable with contributory negligence, which defeated a right of recovery.—*Bell vs. West Jersey & Seashore*, 244 Fed. 104. Decided July 30, 1917.

Hours of Service Act—Emergencies

A dispatcher intended to have carloads of live stock picked up by a certain train, but through inadvertence and oversight failed to give the necessary orders. To avoid holding the live stock until the next day, and causing loss and damage to the shipper and the company, he ordered the cars to be picked up by a train which, owing to unexpected and unforeseen delays, did not leave the station where they were picked up until the operator had been on duty more than the legal period—13 hours. The Circuit Court of Appeals, Eighth Circuit, holds that there was no emergency justifying the excess service under section 2 of the Hours of Service Act.

A train dispatcher was misinformed as to the time of arrival of a train load of silk to be delivered to his road by a connecting road. Wishing to move the train with promptness, he kept an operator on duty for more than the legal period—

9 hours—to hold another train and receive orders in reference thereto, and thus permit the prompt moving of the silk train. It is held there was no emergency justifying the operator's excess service.

A telegraph operator was kept on duty more than the legal period, 9 hours, because part of a freight train was derailed on account of a draw bar pulling out of one of the cars and falling on the track, thereby delaying a passenger train in reaching his station, and it was necessary to hold him on duty until such train arrived for the purpose of handling the mail and caring for passengers on its arrival. It is held the excess service was caused by an emergency, and was justified.

A train was delayed in leaving a station owing to broken packing rings in one of the cylinders of the engine, making it necessary to send for a relief engine. It is held that this was not such an emergency as justified keeping the operator at such station on duty more than the legal period, 9 hours, since while the word "emergency," as used in the act does not mean an extraordinary emergency as used in some statutes, it means more than ordinary mistakes and negligences, which happen in the practical operation of railroads.—*United States vs. Missouri Pacific*, 244 Fed. 38. Decided June 5, 1917.

Hours of Service—Computation

A telegraph operator was on duty regularly from 7 A. M. to 5 P. M. On one occasion he was excused from 1.30 P. M. to 3 P. M., when he returned to duty and remained on duty until 5.10 P. M. The Circuit Court of Appeals, Eighth Circuit, holds that the 24-hour period commenced at 7 A. M., and the fact that the operator was on duty for more than 9 hours in the 24-hour period commencing at 3 P. M. was not a violation of the Hours of Service statute. The railroad, being the party which must obey the law, the court said, "ought in all fairness to know before the employee is permitted to work just what is being done with reference to hours of service, so that the law may not be violated. It, therefore, by agreement with its employee fixes the time that the hours of service shall commence, and when they shall end. This being done, an inspector in the employ of the United States appears, and looking over the record of the hours of service, arbitrarily and contrary to the agreement between the railway company and the employee, establishes, after the service has been rendered, a different time for the commencement of the 24-hour period, and, by combining certain isolated hours of service performed on different days, seeks to show a violation of the law. We are of the opinion that the law or justice will not permit this to be done.

"It is claimed that any construction of the law which will permit the railway company to do that which is alleged to have been done would nullify the statute. To show that this is so, it is contended that a 9-hour operator might be required to work for 17 hours without rest. For instance, taking the employee described for illustration, it is claimed that he could be worked from 7 A. M. to 8 A. M. on September 6th, and then be excused from duty until 11 P. M. of the same day, and then be required to work through until 7 o'clock the next morning, when he again would be obliged to begin his regular day's work, and work through until 4 P. M. that day. In view of the fact that no instance of this kind is shown to have ever occurred, and the improbability that it will ever occur, we may say, in the language of the Supreme Court, in *United States vs. A. T. & S. F.*, 220 U. S. 37, 'This hardly is a practical suggestion.' If any such abuse of the law shall happen, Congress undoubtedly will regulate the matter by proper legislation. The employee mentioned had an unbroken rest between the time when he finally quit work on September 6th and the time when he resumed his duties on September 7th of 13 hours and 50 minutes, so that it appears that he was not overworked or deprived of a proper period of rest. In using the expression 'any twenty-four hour period' Congress did not intend to describe what should constitute in any one particular case a 24-hour period. The time when an employee should go to work and when he should be allowed to quit, provided the law was not violated, was left to the agreement between the employee and the employer. It would seem natural that an employer might on occasions, for the convenience of the employees, or to suit the exigencies of traffic, permit or require an operator to divide his usual hours of service."—*United States vs. Missouri Pacific*, 244 Fed. 38. Decided June 5, 1917.

Equipment and Supplies

LOCOMOTIVES

THE MISSOURI, KANSAS & TEXAS is inquiring for Mikado type locomotives.

THE ATLANTA & WEST POINT is inquiring for Santa Fé type locomotives.

THE WHEELING & LAKE ERIE is inquiring for eight-wheel switching locomotives.

THE RICHMOND, FREDERICKSBURG & POTOMAC is inquiring for 2 six-wheel switching locomotives.

THE EGYPTIAN STATE RAILWAYS have ordered 70 ten-wheel locomotives from the Baldwin Locomotive Works.

THE CHICAGO, MILWAUKEE & ST. PAUL's order for equipment for the Othello-Tacoma electrified section, reported in last week's issue, is divided as follows: 10 electric locomotives and 3 substations from the Westinghouse Electric & Manufacturing Company; 7 locomotives and 5 substations from the General Electric Company.

THE RUSSIAN GOVERNMENT's order for 1,500 locomotives reported in the *Railway Age Gazette* of October 5 and that for 30,000 freight cars mentioned in the *Railway Age Gazette* of October 26 have not yet been definitely signed, but it is understood that work will be begun on these contracts as soon as final arrangements have been made.

THE UNITED STATES WAR DEPARTMENT.—The French Government was incorrectly reported in the *Railway Age Gazette* of October 19 as having placed orders through the United States Government for 640 locomotives. This report was confused with orders placed by the United States Government for its own uses in France and included not 640 locomotives, but 920. Orders were placed by the War Department for our own uses overseas with the Baldwin Locomotive Works for 600 additional 50 hp. gasolene locomotives, 20 150 hp. gasolene locomotives, and for 300 additional 80-ton Consolidation locomotives which will follow the 680 now being built. The United States Government has also ordered 30 small saddle tank steam locomotives from the Vulcan Iron Works. It thus results that the War Department has placed orders, since the middle of July, for no less than 2,014 locomotives, a large number of which have already been built and shipped. Of this total number the Baldwin Locomotive Works received 1,834, the American Locomotive Company 150, and the Vulcan Iron Works 30.

FREIGHT CARS

THE CALUMET & ARIZONA MINING COMPANY, Warren, Ariz., is inquiring for 40 tank cars.

THE GARDENER EXTRACT COMPANY, Basic City, Va., is inquiring for 5 8,000-gal. capacity tank cars.

THE KANSAS OIL REFINING COMPANY, Coffeyville, Kan., is inquiring for 25 8,000-gal. tank cars.

THE WESTERN PACIFIC has ordered 1,500 box cars from the Mount Vernon Car Manufacturing Company and 400 general service cars from the Western Steel Car & Foundry Company.

The United States Government has placed orders for 4,975 additional freight cars for use of the American forces overseas. The division of the order is as follows:

No.	Type	Builder
400	Box	St. Louis Car.
400	Box	Central Car & Loco.
450	Box	Mt. Vernon.
500	Box (with guerite)	Am. Car & Fdy.
375	Box (with guerite)	Pullman.
350	High side gondola	Standard Steel.
350	High side gondola	Standard Steel.
500	Low side gondola	Pressed Steel.
500	Low side gondola	Cambridge.
125	Tank	Am. Car & Fdy.
125	Tank	Gen. Am.
250	Refrigerator	Haskell & Barker.
500	Flat	Southern.

Supply Trade News

Don L. Clement, eastern railway representative of Pratt & Lambert, Buffalo, N. Y., with offices in New York, has received a commission as first lieutenant of the 35th Regiment Railway Engineers, now stationed at Rockford, Ill.

The Balkwill Manganese Crossing Company, 1808 East 82nd street, Cleveland, Ohio, has been formed as a holding company to take over the Balkwill patents. The holding company will license crossing manufacturers to manufacture the Balkwill crossing under the Balkwill patents.

The National Railway Appliance Company, New York, has been made the eastern and southern representative of the Valley Steel Company of East St. Louis, Ill., and will handle its full line of axles, locomotive driving axles, piston rods, side rods, crank shafts, in normal or heat treated grades.

Chas. A. Carscadin, president of the National Car Equipment Company, Chicago, has been elected a vice-president of the Joliet Railway Supply Company, Chicago. James H. Slawson, vice-president of the Joliet Railway Supply Company, has been elected a vice-president of the National Car Equipment Company.

E. A. Hawks, of Detroit, has been appointed special representative for the Youngstown Steel Car Company, Youngstown, Ohio. Mr. Hawks will handle the selling of the products of this concern to certain railway companies, and also among the automobile companies. His office is Dime Bank building, Detroit, Mich.

The Consolidated Boarding & Supply Co., 1838 Transportation building, Chicago, has changed its name to the Mosher & Crawley Company. There are no changes in the financial end of the business. Geo. H. Mosher and M. D. Crawley, the partners in this firm, are both known to many railway men as they have been associated together in this work for the past 20 years.

In the announcement in last week's issue that Clement F. Street had opened an office as consulting mechanical engineer at 50 Church street, New York, the words "the present Locomotive Stoker Company of which Mr. Street was a vice-president" gave an incorrect impression. Mr. Street still is a vice-president and director of the Locomotive Stoker Company and any work that he may do as consulting mechanical engineer will be supplementary to his duties in these capacities.

Norman B. Hickox has been appointed sales and advertising manager of the National X-Ray Reflector Company, Chicago. E. H. Cameron, sales manager, has severed his connection with the company and is now located in Seattle, Wash. Hugh D. Butler, manager Chicago sales, has been promoted to assistant sales manager, and Guy R. Hastings, assistant manager Chicago sales, has been appointed manager Chicago sales. George D. Bryson has been appointed assistant advertising manager.

George A. Paff, formerly superintendent of the rod and wire mills at the Aliquippa works of the Jones & Laughlin Steel Company, Woodland, Pa., is now general superintendent at the Monessen works of the Page Steel & Wire Company. Mr. Paff served in the former capacity eight years, previous to which he was superintendent for five years in the rod and wire mills at the Sharon works of the American Steel & Wire Company, having been advanced to that position from master mechanic of the same works.

TRADE PUBLICATIONS

GRINDING WHEEL REFERENCE CARD.—The American Emery Wheel Works, Providence, R. I., has published a grinding wheel speed and reference card. One side of the card shows the kind of abrasive, grain and grade recommended for various classes of work, while the other side shows the revolutions per minute for speeds of 4,000, 5,000 and 6,000 ft. per minute for wheels ranging from 1 to 60 in. in diameter.

Railway Construction

OREGON-WASHINGTON RAILROAD & NAVIGATION COMPANY.—This road is building a roundhouse at Tacoma, Wash., which will cost about \$10,000. The building will contain three stalls, 97 ft. long. It will be a frame structure with concrete pits and concrete footings supported on piles. The contract for the work was let to the E. J. Rounds Construction Company, Seattle, Wash.

PHILADELPHIA & READING.—Contracts have been let for work aggregating in cost about \$350,000 in connection with the abolition of the grade crossing at Tulip street, Philadelphia, on the Port Richmond branch. The cost of this work is being borne jointly by the railroad company and the city of Philadelphia. The contract for the steel superstructure went to the McClintic-Marshall Company for \$164,000. It is said that the unit price for steel is about 5½ cents a pound and that, as compared with the prices prevailing before rates were established by the government, the cost of this bridge is about \$46,000 less than it would have been. The contract for concrete walls, piers and bridge floors went to C. P. Bowers, and that for waterproofing to the Benjamin Foster Company.

SANTA FE LINES.—The Atchison, Topeka & Santa Fe is building additional repair shops at Ottawa, Kan., at a cost of about \$60,000. Swanson Brothers Contracting Company, Topeka, Kan., has the contract for the work.

The Dodge City & Cimarron Valley, a Santa Fe subsidiary, will be built from Satanta, Kan., west to the Colorado line, about 62 miles. This work will involve moderately heavy grading.

RAILWAY FINANCIAL NEWS

GRAND TRUNK.—This company has paid off its \$4,000,000 5 per cent two-year notes due November 1, 1917, through Blair & Co., New York.

ILLINOIS CENTRAL.—The Illinois Public Utilities Commission has authorized this company to issue \$6,360,000 4 per cent refunding mortgage bonds, due 1955, to take up indebtedness incurred for improvements and additions north of the Ohio river; also \$8,206,100 Illinois Central-Chicago, St. Louis & New Orleans 5 per cent refunding bonds for improvements south of the Ohio river.

PITTSBURGH & WEST VIRGINIA.—This company has declared a dividend of 1½ per cent on the first preferred stock, payable December 1 to stock of record November 5. Three months ago the initial quarterly dividend of 1½ per cent was declared.

RIDGEFIELD & NEW YORK.—Judge Howard J. Curtis, in the Superior Court at Bridgeport, Conn., has appointed William B. Boardman, of that city, receiver. The action was brought by the New York, New Haven & Hartford to wind up the affairs of the Ridgefield & New York road. The Ridgefield & New York Railroad was incorporated in 1867 with a capital stock of about \$500,000, not all of which, however, it was said in court, had been paid in. No rails were laid. In 1897 the New Haven obtained a majority of the stock. The charter was renewed by the Connecticut legislature from time to time until 1909, when further renewal was refused and the charter expired.

RICHMOND & RAPPAHANNOCK RIVER.—President Thomas P. Love has been appointed receiver of this road, which operates between Richmond, Va., and Pamunkey, 16 miles.

THROUGH TRAINS—BERLIN TO RIGA.—Through trains are now running from Berlin to Riga, the trip consuming 24 hours. A person can travel from the Baltic seaport to Ostend, Belgium, with one change of cars at Berlin, in 45 hours.

FINANCING NEW CONSTRUCTION IN CHINA.—According to press despatches, negotiations are going on between the Chinese government and a Japanese company interested in China on a loan of about \$50,000,000 for the construction of a railway between Chaochow, in Kwangtung, and Nanchang, in Kiagsi.

Railway Officers

Executive, Financial, Legal and Accounting

R. S. Staten has been appointed claim agent of the Missouri & North Arkansas, with office at Harrison, Ark.

James F. Wright, assistant to general counsel of the Seaboard Air Line, has been appointed assistant general counsel, with headquarters at Norfolk, Va.

C. H. Dietrich, assistant freight claim agent of the Chicago, Milwaukee & St. Paul, has been promoted to freight claim agent, which position was held by H. P. Elliott, whose death was mentioned in these columns on November 2. C. W. Wilkinson was appointed assistant freight claim agent succeeding Mr. Dietrich.

W. A. Danforth, treasurer of the Bangor & Aroostook at Bangor, Me., having resigned to accept a position elsewhere. Wingate F. Cram has been elected treasurer, and F. A. W. Field has been appointed assistant treasurer. Mr. Cram, in addition to his new duties, will continue as clerk and as chairman of the valuation committee.

James Russell, general manager of the St. Louis Southwestern has been elected vice-president in charge of operation of the Denver & Rio Grande, with headquarters at Denver, Colo. Finley J. Shepard, vice-president of the Missouri Pacific at New York has been elected also vice-president of the Denver & Rio Grande to succeed Arthur Coppell. R. F. Watkins has been elected treasurer of the Denver & Rio Grande, with office at Denver, to succeed T. H. Marshall, who becomes assistant treasurer, with office at Denver. A portrait of Mr. Shepard and a sketch of his railway career were published in the *Railway Age Gazette* of June 8, 1917, page 1216.

Operating

J. L. Brown, car accountant of the Chicago, Milwaukee & St. Paul, has been promoted to assistant superintendent of transportation, with headquarters at Chicago.

A. P. Milliken, trainmaster of the Boston & Maine at Boston, Mass., has been appointed assistant superintendent of the Portland division, with headquarters at Boston.

F. E. Slack, assistant trainmaster of the Philadelphia & Reading, at Philadelphia, Pa., has resigned to enter the service of the American International Shipbuilding Corporation.

S. J. Hungerford, superintendent of rolling stock of the Canadian Northern at Toronto, Ont., has been appointed general manager of the Eastern Lines, with headquarters at Toronto.

Charles F. Heath has been appointed superintendent of steamers of the Southern Pacific Company, Pacific System, with jurisdiction over all floating equipment, vice John A. Carson, resigned.

F. H. Post, supervisor of stations and transfers of the Erie, has been appointed superintendent of stations and transfers of the Buffalo, Rochester & Pittsburgh, with headquarters at Rochester, N. Y.

F. W. Lyons has been appointed trainmaster of the Minnesota division of the Northern Pacific, with headquarters at East Grand Forks, Minn., succeeding F. M. Smith, granted leave of absence to enter military service.

James M. Giffand has been appointed inspector of transportation of the Philadelphia & Reading and subsidiary lines, with office at Reading, Pa., vice Agnew T. Dice, Jr., granted leave of absence to enter the government service.

Augustus E. Ruffer, superintendent of transportation of the Erie at New York, has been appointed general superintendent of transportation, with headquarters at New York. A sketch of Mr. Ruffer's railway career was published in the *Railway Age Gazette* of May 4, 1917, page 972.

J. J. Butler, trainmaster of the Chicago & Alton, at Bloomington, Ill., has been promoted to assistant to the general manager, with headquarters at Bloomington. R. J. McDonald, trainmaster at Roodhouse, has been transferred to Bloomington, succeeding

Mr. Butler. R. J. Burdett has been appointed trainmaster at Roodhouse.

A. G. Smart, whose appointment as general superintendent of the Nebraska district of the Chicago, Burlington & Quincy, with headquarters at Lincoln, Neb., was announced in the *Railway Age Gazette* of October 5, began railroad work

with the Burlington in 1885, being first employed in telegraph, station and yard service. Later he was consecutively train despatcher on the St. Joseph and Wymore divisions, and night chief despatcher and chief despatcher of the Wymore division. Subsequently he was successively superintendent of the Omaha, Aurora and Beardstown divisions. On October 1, 1917, he was promoted to general superintendent of the Nebraska district, with headquarters at Lincoln, Neb.



A. G. Smart

J. C. Kinton, trainmaster of the Coal & Coke Railway at Gassaway, W. Va., has been appointed acting assistant superintendent, vice J. W. Deneen, resigned, and J. D. Nicholas has been appointed trainmaster of the Southern district, and S. P. Burns has been appointed acting trainmaster of the Northern district.

H. B. Titcomb, whose appointment as superintendent of the Stockton division of the Southern Pacific, was mentioned in these columns on October 19, was born in Indianapolis, Ind., in December, 1871. He

graduated from Cogswell Polytechnical College in 1891, and on July 3 of the same year entered the service of the Southern Pacific as a draftsman. He was promoted to assistant engineer, construction division, in 1898; was appointed roadmaster of the western division in 1899; and was successively roadmaster of the Shasta and Sacramento divisions from 1900 to 1904. He was assistant resident engineer from 1904 to 1905, resident engineer at San Joaquin, Cal., 1905 to 1906, and at Los Angeles, 1906 to 1909. He was district

engineer, with headquarters at Los Angeles, from 1909 to 1914; and maintenance of way assistant to the assistant chief engineer, San Francisco, from 1914 to October 15, 1917, when he was promoted to superintendent of the Stockton division.

J. Irwin, superintendent of the Canadian Northern, at Rosedale, Ont., has been appointed superintendent of the third division, western district, with headquarters at Edmonton, Alta., vice G. A. Cunliffe, who has been appointed superintendent of the fourth division, central district, with headquarters at Brandon, Man., vice I. L. Boomer, transferred.

R. A. MacPherson, assistant to the general superintendent of the Grand Trunk Pacific, was appointed superintendent on October 29, with headquarters at Melville, Sask., succeeding H. McCall, promoted. Effective on the same date C. B. Mutchler was appointed assistant to the general superintendent at Winnipeg, Man., succeeding R. A. MacPherson and will continue in his position as signal engineer.

F. W. Urbans, assistant superintendent of the Minneapolis, St. Paul & Sault Ste. Marie, at Chicago, has been appointed acting superintendent of the southern district—Chicago division, with headquarters at Fond du Lac, Wis., a leave of absence having been granted C. M. Winter to enter military service. W. W. Wade, train master at Stevens Point, has been appointed acting assistant superintendent of the southern district, Chicago division, with headquarters at Chicago.

Robert E. Woodruff, superintendent of the Mahoning division of the Erie, at Youngstown, Ohio, has been appointed superintendent of transportation of the lines west of Salamanca; Carl Bucholtz, assistant superintendent at Youngstown, has been appointed superintendent of the Mahoning division, with office at Youngstown, succeeding Mr. Woodruff, and John M. Condon, trainmaster of the Kent division at Meadville, Pa., has been appointed assistant superintendent of the Mahoning division, with office at Youngstown.

R. W. Mitchener, whose appointment as general superintendent of the New York, Chicago & St. Louis, with headquarters at Cleveland, Ohio, was announced in the *Railway Age Gazette* of

November 2, was born on March 7, 1857, at New Philadelphia, Ohio. From April, 1877, to August, 1889, he was successively telegraph operator, station agent and train despatcher for the Cleveland, Lorain & Wheeling, now a part of the Baltimore & Ohio, and later was train despatcher on the Cleveland and St. Louis divisions of the Cleveland, Cincinnati, Chicago & St. Louis. He then entered the service of the New York, Chicago & St. Louis as chief train despatcher, and in April, 1894, became trainmaster. He was promoted to superintendent



R. W. Mitchener

of telegraph in September, 1906, and from February, 1908, to June, 1912, was a division superintendent. On the latter date he was made superintendent of transportation, which position he held until his recent appointment as general superintendent.

L. R. Huntley, superintendent of car service of the Evansville & Indianapolis, will assume the duties of supervisor of car service at Terre Haute, Ind., and will have charge of all matters pertaining to car efficiency, effective November 1. The position of superintendent of car service has been abolished and car accounting matters, wheel reports, interchange reports, car mileage, demurrage, shortage, weight and grain door records will be reported to the auditor or car accountant.

E. J. Hackenberg, who has been appointed division superintendent of the Northern Pacific, with headquarters at Staples, Minn., as was announced in these columns on October 26, was born at Carlisle, Pa., on November 26, 1863. He entered railway service in 1883 as a telegraph operator on the Cleveland and Marietta division of the Pennsylvania. He was train despatcher for the same company at Cambridge, Ohio, from 1884 to 1891; from 1891 to 1898 he was chief train despatcher of the Cleveland, Canton & Southern at Canton, Ohio, and from 1898 to 1900 night chief despatcher on the Northern Pacific at Staples, Minn. He was chief despatcher from 1900 to 1903, and trainmaster from 1903 to October 20, 1917, on which date he was promoted to superintendent at Staples, succeeding F. R. Bartles, transferred to superintendent of the Rocky Mountain division at Missoula, Mont.

Robert Edward Ryan, whose appointment as superintendent of the central and western divisions of the Minneapolis & St. Louis, with headquarters at Minneapolis, Minn., was announced in the *Railway Age Gazette* of October 19, was born at Newbern, N. C., on September 18, 1872. He began railway work in 1896 with the St. Louis, Iron Mountain & Southern, and re-

maintained with that road 14 years, filling successively the positions of operator, agent and trainmaster. He then went to the Minneapolis & St. Louis as trainmaster, and subsequently became assistant superintendent, holding the latter position at Watertown, S. D., until September 1, 1917, when he was promoted to division superintendent, as above noted.

Traffic

W. C. Douglas has been appointed division freight agent of the Michigan Central, with office at Detroit, Mich., vice F. J. Parker, promoted.

J. W. Switzer, chief clerk in the general passenger department, Michigan Central, Chicago, has been appointed assistant general passenger agent at Detroit. This position was formerly held by L. D. Heusner, who died on October 25.

B. T. Breckenridge, commercial agent of the Illinois Central at Evansville, Ind., has been appointed assistant general freight agent at Louisville, Ky., succeeding J. L. Durrett, relieved account of sickness. C. L. Netherland, assistant commercial agent at Chicago, has been promoted to commercial agent at Evansville, Ind., succeeding Mr. Breckenridge.

T. J. Cook, general freight agent of the Toledo & Ohio Central and the Zanesville & Western, was appointed general freight and passenger agent, Toledo, Ohio, with authority extending over the passenger traffic department, effective November 1. He takes over the duties of Moulton Houck, general passenger agent, resigned, the position of general passenger agent being abolished.

R. B. Kinkaid, whose appointment as assistant general freight agent of the Cincinnati, Indianapolis & Western, with headquarters at Indianapolis, Ind., was announced in the *Railway Age Gazette* of October 12, was born at Buelah, Kan., on April 26, 1884. He began railway work in 1900 as a clerk in the accounting department of the Indiana, Illinois & Iowa at Kankakee, Ill., and was subsequently employed in the accounting departments of that road, the Chicago, Rock Island & Pacific and the Gulf, Colorado & Santa Fe as a rate and interline clerk. In October, 1906, he went to the Chicago, Cincinnati & Louisville as rate clerk in the freight traffic department at Cincinnati, Ohio. Later he was employed on various railroads as rate and tariff clerk until November, 1910, when he became connected with the Lake Erie & Western. He was made chief clerk to the chief of tariff bureau of that road in February, 1911, and on December 1, 1915, he became chief of tariff bureau of the Cincinnati, Indianapolis & Western. On October 1, 1917, he was promoted to assistant general freight agent of the latter road, with jurisdiction over the Sidell & Olney.

Railway Officers in Military Service

C. M. Winter, superintendent of the Minneapolis, St. Paul & Sault Ste. Marie at Fond du Lac, Wis., has been granted leave of absence and has received a commission in the United States regular army for service with the Russian Railway Corps.

Engineering and Rolling Stock

S. E. Shoup has been appointed acting division engineer of the Kansas City terminal division, Kansas City Southern, effective November 1, succeeding A. Leckie, division engineer, temporarily assigned to other duties.

E. H. Nickerson, chief engineer of the Yosemite Valley, has resigned. His duties pertaining to track, bridges and buildings will be performed by George Dudley, appointed roadmaster, with headquarters at Merced, Cal.

F. B. Rowell, engineer of real estate of the Boston & Maine, has been appointed research engineer, and John B. Russell, chief draftsman of the valuation department, succeeds Mr. Rowell as real estate engineer. Both with headquarters at Boston, Mass.

H. W. Wagner, who has been promoted to chief engineer of the Atchison, Topeka & Santa Fe, eastern lines, with headquarters at Topeka, Kan., as was announced in these columns on October 26, was born at Boone, Ia. After graduating from the engineering school at Kansas University, he entered the service of the Santa Fe on May, 1897, as chairman in the maintenance department at Newton, Kan., and was promoted to rodman and later to transitman in May, 1900. He left the Santa Fe to go with the Union Pacific on relocation, change of line and new location work on that road and the Oregon Short Line, starting as levelman and later being promoted to transitman and then locating engineer. He returned to the Santa Fe in 1902 as division engineer at Arkansas City, Kans., being transferred later to Marceline, Mo., and La Junta, Colo.; from May, 1909, to January, 1910, he was division engineer on construction, and from June, 1910, to April, 1913, principal assistant engineer at Amarillo, Tex., on which latter date he was promoted to district engineer at La Junta, which position he held until his appointment as chief engineer, effective October 15, succeeding R. A. Rutledge, transferred to La Junta as engineer, northern district, on account of ill health.

Purchasing

R. E. Scott, whose appointment as purchasing agent of the Spokane, Portland & Seattle, with headquarters at Portland, Ore., was announced in these columns on October 19, was born July 17, 1887, at Barnesville, Minn., and graduated from the mechanical engineering department of Purdue University in 1911. The same year he entered the service of Fairbanks, Morse & Co., at Jacksonville, Fla., where he remained until August, 1914, when he became eastern representative of the Gurney Refrigerator Company at New York. On September 1, 1914, he was appointed roadmaster of the Oregon Electric, which position he held until September 30, 1917, when he was appointed purchasing agent of the Spokane, Portland & Seattle, with headquarters at Portland, Ore., succeeding S. M. Clark, resigned.

OBITUARY

R. H. Tate, division freight agent of the Southern Railway at New Orleans, La., died in that city on October 29.

Edward Dagle, formerly superintendent of terminals of the Chicago, St. Paul, Minneapolis & Omaha at St. Paul, Minn., died recently at Superior, Wis.



H. W. Wagner



R. B. Kinkaid



R. E. Scott

Railway Age Gazette

Volume 63

November 16, 1917

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Experience with "Brown's Discipline" is not specially easy to describe, unless the history of the years to be reviewed has been put on record, year by year, and the responses to the *Railway Age Gazette's* prize offer, issued last July, have not been very numerous. Only two of the papers received are sufficiently comprehensive to be accepted for publication. Both of these have been written by chief clerks in superintendent's offices; not administrators of discipline, but keen and level-headed observers; and observers at close range. The prize goes to Sanford J. Keeler of Peoria, Ill. The next best paper is that of E. H. Heath of Herington, Kan. This paper appears in this issue, and the prize paper will be published later. Both writers record the same general conclusions, but the reader will profit by a perusal of both papers because of the different phases of "human interest" to be found in them. Both of these writers seem to assume that the marking of demerits—30, 60, etc., (as equivalent to 30 days' or 60 days' suspension) is the accepted and only scheme of recording punitive discipline; so that the very acceptable plan in operation on the Burlington and the Baltimore & Ohio, where no such mathematical measurement is attempted, is another branch of the subject in which further profitable discussion may be looked for.

"Are We Capable of Self Government?" This is the title of a recent book by Frank W. Noxon, who is well known to the readers of this paper as the secretary of the Railway Business Association. We publish in another column a review of the book, which has been written by Frank Trumbull, chairman of the Railway Executives' Advisory Committee. For some years before this country entered the great war the most important questions to which the public mind was devoting its attention concerned the relations between government and business. It was the way in which the public dealt with these questions rather than the way in which it dealt with purely political matters that made the title of Mr. Noxon's book highly pertinent. These questions concerning the relations between government and business have been made more rather than

less pressing by our entrance into the war. The government, since we entered the war, has been regulating the charges made for many things besides the services of public utility enterprises. Mr. Noxon devotes a large part of his book to the way in which the state and national governments have regulated the railways, but the book as a whole is a full review and a broad consideration of the manner in which they have dealt with industry generally. Mr. Noxon's conclusion from past experience is that we are capable of self government, and he indicates pretty clearly how he believes that the great problem of establishing satisfactory and beneficial relations between government and business is going to be solved. We are glad to publish Mr. Trumbull's review of the book because we believe it is one which those especially interested in railway problems will find worthy of careful reading.

The full-crew law decision of the New Jersey Public Utility Commissioners, reported in another column, gives the impression that the commissioners, like a more distinguished governmental body, in a decision affecting trainmen last year, has aimed at only one thing—to please the labor unions; and it settles nothing. It is the barren "Not Proven" of the Scotchmen. This unfavorable impression is unavoidable because the facts concerning the extreme wastefulness of a third trainman on through freight trains are so well recognized, by the public as well as by railroad men, and because the commissioners, so far as their report shows, made no effort to get at, or record, or consider the really significant facts in this particular case. The law requires them to consider and decide how many men are required on trains "to protect the public and the employees"; and all they have to say is that the railroad has not made out a case. If the railroad has failed to explain the matter fully, it is the commissioners' duty to call it to account. They are the servants of the public, and the public needs that useless brakeman for very necessary work on other trains or in other lines of effort. The public should not only allow but should require the railroad to use its men and money to more useful purpose. After the principal railroads all over the country for from 10 to 20 years

The New Jersey Full Crew Law

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have been running long freight trains with two brakemen, with no material sacrifice of safety, any intelligent and practical man who asserts the need of three, as a safety measure, simply stultifies himself. Legislators may salve their consciences, where consciences demand something to quiet them, by mixing ideas of convenience and ideas of safety; but this statute deals only with safety, and railroad commissioners cannot plead ignorance as legislators can. The specific issue in this case was the question, How can we decide whether the third brakeman can safely be dispensed with? The railroad asked for a general order covering all through freight trains; the commissioners, adopting the absurd position of the brakemen's lawyer, held, apparently, that they would have to be present in person at the railroad yard when each train started out! The railroads of the country—and of the world—have been obliged, from the first, to decide upon a regular number of brakemen to man a given class of trains, and to put on additional men only on very unusual occasions; but these commissioners assume that this problem of a standard crew is so difficult that they are unable to solve it, after holding hearings consuming many days. Judging by their statement of facts, the commissioners' minds became absorbed with details of operation affecting convenience and expediency and allowed the question of safety, the only point at issue, to drop out of sight!

MR. THELEN EXPLAINS HIS POSITION

IN our issue for October 19 we published an editorial entitled "Official Misrepresentation of the Railways." In that editorial we challenged certain statements made by Max Thelen in his presidential address at the annual meeting of the National Association of Railway and Public Utility Commissioners, and offered him our columns in which to reply to our animadversions upon his remarks. He has availed himself of our offer and we publish elsewhere a letter from him. We are gratified to learn from his letter that there is not so much difference between the views of this able railway commissioner and those of the *Railway Age Gazette* as we supposed when we read his address.

Mr. Thelen replies specifically to the criticisms which we passed upon three parts of his address, namely, those relating to railroad efficiency, to railroad valuation and to the duplication of facilities, service and operating expenses.

In his address he referred to the "waste and inefficiency (in railroad operation) which were pointed out by the Interstate Commerce Commission in the 5 per cent rate case." The *Railway Age Gazette* said in reply: "We have sought in vain for a single word in this opinion which pointed out such 'waste and inefficiency' as Mr. Thelen refers to," and added: "We boldly assert that there is no such word in it." Mr. Thelen in his letter expresses surprise that any one who has read the opinion should raise this point and attempts to defend himself against our criticism by making certain quotations from the opinion.

It is true that the commission indicated that there was room for the introduction of further economies in railroad operation, but, as the very language which Mr. Thelen himself quotes shows, it said that these opportunities for the introduction of further economies existed in railroading "as in other lines of business." Now, to assert that there is "waste and inefficiency" in the railroad business—language which the commission itself never used—sounds very different from saying there are opportunities in railroading, "as in other lines of business," for the introduction of economies. Mr. Thelen quotes statements made by the commission regarding the room which existed for improvement in the handling of freight cars. But just before the commission used the language which Mr. Thelen quotes, it had said: "In certain departments of railroading great advances have been made in efficiency in recent years; for instance, by increas-

ing the trainloading." The commission also referred to the possibilities of increased economy in the use of fuel, but it said: "Much has been done in recent years by means of mechanical devices and otherwise to reduce fuel costs. Thus the Baltimore & Ohio since 1910 reduced its coal consumption 9½ per cent per unit of freight traffic moved." Furthermore, the commission made this general statement regarding the efficiency of the railways: "We may justly feel proud of the developments of our transportation system. Despite occasional discreditable chapters, the history of our railroads has been marked by great achievements."

The foregoing quotations are from the majority opinion. In his dissenting opinion, Commissioner Daniels said: "As a necessary outcome of their declining ability to show profit, the attractiveness to investors of railroad securities has correspondingly grown less. In individual instances this reluctance to invest in such securities is traceable in part to careless or dishonest railroad management; but fortunately these instances of improper administration are the exception and not the rule. Offsetting them are demonstrations of exceptional progress in economy and efficiency of operation."

Does such language justify Mr. Thelen in attributing to the commission a general allegation of "waste and inefficiency"?

Mr. Thelen asserted in his address that "the carriers were at first largely in favor of the valuation" but "seem now to be generally opposed to" it. He says in his letter that he will not split hairs with us over the difference between "favoring" the valuation and "acquiescing" in it. But it is not a question of hair-splitting. He asserted that the carriers at first favored the valuation and we asserted in reply that they never did favor it. If they had favored it at first, and then, after it was under way, had tried to get it stopped, the plain implication of Mr. Thelen's statement, that they had become afraid to have the facts ascertained, would have been justified. But most railway men never believed in valuation as a basis for rates, and don't believe in it now. Mr. Thelen says that "it would be far wiser for the railroads to accept the situation than try to suspend or stop the valuation." The *Railway Age Gazette* agrees with that. If the people of the United States want to know a lot of facts about the railroads which it will cost the people a vast sum of money to ascertain and which will be useless for practical purposes after they are ascertained, the railways ought to acquiesce in the continuance of the valuation, just as they acquiesced in the passage of the legislation for it.

Mr. Thelen in his address referred to the duplications of railway facilities and services and, in consequence, of railway expenses, in language which seemed to us clearly to imply that the entire responsibility for these things lay with the railway managements. In our comments upon his address we contended that the responsibility lay with the government as well as with the railways. In his letter Mr. Thelen protests that his statement was not a "criticism" of the railroads and agrees with us that the government, as well as the railways, is responsible. He adds: "To the extent that legislation is responsible for existing waste and inefficiency in railroad operation, legislation must be changed. To the extent that the railroads are responsible, they must do their share of the work." That is a fair statement of the case.

Mr. Thelen adds that "it would be far wiser to stop trying to pick flaws and to work together, first, to ascertain the facts, and, second, to make such improvements in the existing order of things as the facts and the welfare of our people require." Let us hope this policy will be adopted, both by those who operate the railways and those who regulate them. There is at least as much need for a cessation of criticisms and attacks upon those who are devoting their experience, their energy and their ability to the operation of

the railways as for a cessation of criticisms and attacks upon those who are regulating them. The general policy of many railway regulating authorities has been to place heavy burdens and innumerable restrictions upon the management of railways and then to stand off and throw stones at them because they have not got as good results as the railway commissioners—most of them ignorant of practical railway matters—have imagined they ought to get. If the program adopted by the Association of Railway Commissioners, as outlined by Mr. Thelen, indicates that its members generally are going to begin to co-operate with the managements of the railways, instead of putting obstacles in the way of their efficient operation, the change is most gratifying. Both the railway managements and the regulating authorities have made serious errors. In the emergency created by the war they are afforded opportunities for co-operation in the public interest which would largely offset the effects of their past errors.

RECORD-BREAKING EARNINGS AND EXPENSES IN AUGUST

THAT the total earnings and the operating expenses and taxes of the railways in August broke all records for a single month is disclosed by the complete statistics of the Class 1 roads for August, which have just been made public by the Bureau of Railway Economics. The detailed statistics are published elsewhere in this issue.

The same statistics show that in spite of the fact that the roads in that month had the largest earnings ever known, the increases in their expenses and taxes were relatively so much greater than the increase in their total earnings that for the first time since March, 1917, the net operating income of the railways of all the three large territories of the country, east, south and west, showed a loss as compared with the same month of 1916.

The total earnings of the Class 1 roads in August, which include all the railways of any considerable size, were \$365,316,147. This was an increase of \$13,500,000 over the earnings of last June, which previously held the record. The increase per mile of line over August 1916, was 11.4 per cent.

Total operating expenses were \$246,341,511 or almost \$8,000,000 greater than those of May, 1917, which previously was the record month for expenses. The increase in operating expenses per mile as compared with August, 1916, was 20.8 per cent. The taxes charged up in August were \$16,999,686, which was a small increase over the previous high figure, which was reached in June, 1917, and was 24.6 per cent greater per mile than the taxes charged to August, 1916.

For several months the railways of the eastern district have been regularly showing losses of net operating income as compared with 1916, but during most months the railways of the southern and western districts have been able to hold their own. In August, however, the western lines with an increase of 7½ per cent in total earnings as compared with August, 1916, suffered a decline of 9.2 per cent in net operating income. The southern lines with an increase of 18.6 per cent in total earnings had a decline of 1 per cent in net operating income. The eastern lines with an increase of 13.3 per cent in total earnings had a decline of 7.2 per cent in net operating income. The Class 1 railways as a whole had an increase of 11.4 per cent in total earnings and a decline of 7½ per cent in net operating income.

Among the most remarkable and most unsatisfactory features of the August statistics are the large increases which they disclose in the ratio of operating expenses to total earnings. Comparing August, 1917, with the same month of 1916, the operating ratio of the western lines increased from 59 per cent to 64 per cent; that of the southern lines from

66 per cent to 69 per cent; that of the eastern lines from 64 per cent to 70 per cent, and that of the railways of the country as a whole from 62 per cent to 68 per cent.

Such large increases in the ratio of expenses to earnings in a month of record-breaking total earnings are almost without precedent. When the detailed statistics regarding the operating efficiency of the roads in August are available they will unquestionably show that in that month the railways handled more traffic per mile of line, per employee, per locomotive, per car, than in any previous month in their history. Maximum earnings, maximum operating efficiency and declining net operating income surely make a portentous combination to contemplate.

But what else could be expected with wages, taxes and prices of materials very much the highest ever known; in other words, on a war basis, and rates almost the same as before these great increases of wages and prices began? The railways, unlike every other industry, are on a war basis as to their expenses and on a peace basis as to their income. No other industry could stand such a combination. How long can the railways continue to stand it?

INTERMOUNTAIN RATE CONTROVERSY RENEWED

TESTIMONY presented before the Newlands committee last week at its hearing in San Francisco by state railroad commissioners and representatives of shippers from Arizona, Nevada, Utah, Idaho and Washington indicate that a strong fight is likely to be made at the coming session of Congress for a further amendment of the long and short haul clause, in the fourth section of the commerce law, to prohibit absolutely the charging of a higher rate for a shorter distance, the purpose being, of course, to secure as favorable freight rates from the east to the intermountain territory as are given to the Pacific coast terminals.

Great dissatisfaction was expressed with the results so far obtained from the Interstate Commerce Commission's various decisions with reference to transcontinental rates, because the commission has seen fit to agree with the intermountain contentions only in part; and the intermountain representatives made an urgent appeal to Congress, as represented by the Joint Committee on Interstate Commerce, to take from the commission all discretion in the matter and to enact a rigid long and short haul law. They also indicated that their representatives in Washington would press the fight in Congress with great earnestness.

Without entering at this time upon a discussion of the merits of the controversy, which have been thoroughly threshed out before the commission during the 25 or more years it has been dealing with the subject, it is pertinent to remark that even if the Newlands committee developed little information during its western hearing having a direct bearing on its inquiry into the general problem of railroad regulation, its members must have been strongly impressed with one fact which should be suggestive in their consideration of the question of government ownership. That is that the railroad question presents a large number of aspects which are a source of bitter sectional controversy which would certainly be much intensified if the government actually owned the roads and Congress were responsible for their management. The railroad question is as full of local issues as the tariff or the pork barrel, all of them having a vital effect on the business of the nation as a whole; and if a question involving the relation of terminal to intermediate rates, or the reasonableness of rates, is one to be decided by a political body, largely on the basis of sectional prejudice, Congress could easily find itself overwhelmed with similar demands.

Congress has twice attempted to settle the long and short haul controversy by establishing a general rule. On both

occasions it has decided that while on general principles a railroad should not be allowed to charge a higher rate for a shorter distance than for a longer one, a rigid application of the rule would be unwise. In the original law it left room for exceptions by inserting the qualification "under substantially similar circumstances and conditions." In 1910 it also recognized the necessity for some exceptions by providing that the Interstate Commerce Commission should have discretion to determine what departures might be allowed from the strict rule. In other words, it decided to place the determination of such technical questions in the hands of an expert body. Now, because that body with its technical knowledge of the subject and after 25 years of study of it does not entirely agree with the people of a considerable section of the country, Congress is asked to upset conditions in all other parts of the country by another rule, which, while general in its terms, is intended primarily for the benefit of that section.

It is not difficult to sympathize to a considerable extent with the people of the intermountain country, even though they seem to be blaming the railroads and the Interstate Commerce Commission for a condition which is the result of their natural situation; but after all the years that have been spent in working out a solution of the problem it would seem to be a poor time to renew the agitation in Congress so shortly after the Interstate Commerce Commission has rendered a decision which gives the intermountain region so large a degree of the relief for which it has contended, until opportunity shall have been afforded for testing out the commission's plan. While the intermountain interests have complained that their own rates were too high they have laid particular emphasis on the discriminatory features of the adjustment caused by the coast rates being lower. Now the commission has held that the discrepancy must be removed and although it was required to suspend its order as the result of the ill-considered change in the fifteenth section of the law recently passed by Congress, there is no reason to believe that any considerable further delay will result.

NEW BOOKS

Are We Capable of Self Government? By Frank W. Naxon. 329 pages. Size 5 in. by 8 in. Bound in cloth. Published by Harper & Brothers, New York. Price \$1.50.

In these perplexing times it is a pleasure to read so cheerful and cheering a book. Some of us, in considering the pointed and pertinent question indicated by the title, would be tempted to enumerate some of the conspicuous trials and temptations of the 138-year period during which our government has existed under the Constitution; thus bearing in mind that such a period in the life of a nation is after all not very long. It is much like asking—Is a ten-year-old boy a success?

During the comparatively brief period mentioned, our country has been tremendously enlarged in area, 35 populous self-governing and participating states have been carved out of what was before a wilderness; it has survived the strain of many panics; has freed millions of slaves; has prevented the severance of the Union, and thereby prevented the erection of two or more frontiers in three million square miles of territory; has gone right to the edge of the precipices of greenbackism and of free silver, but averted the plunge into such monetary experiments which, to put it mildly, would have been revolutionary; has survived severe political strains like the Hayes-Tilden electoral contest of 1876; has fought one of the most altruistic of wars ever waged by a nation—namely for the liberation of a neighbor, and then with perfect self-restraint helped set up for that neighbor (Cuba) a new experiment in self-government; and now, with larger vision, has voted conscription, and unprecedented appropriations, in the most altruistic performance of all—to wit, to

enable us to participate in a war to make the *world* safe for democracy, and to establish the new principle in international relations that a nation which violates its word must be punished.

Mr. Naxon's book, however, is useful because it summarizes events in this country commencing with the year 1900—a period with which all of the readers of the *Railway Age Gazette* are familiar through personal experience, and observation, and yet concerning which most of us are more or less forgetful.

Part three, entitled "Achievements," is a record of which American citizens need not be ashamed, and while we may feel that we have not yet "arrived" in the matter of railway regulation, it is encouraging to hope that the same government which has perfected our banking system—described by Mr. Naxon as "The Miracle in Bank Legislation"—will also rise to its opportunity and duty in the matter of stabilizing the credit of the railroads, so as to enable them to serve one hundred million people with a minimum of waste and loss of energy.

It is also encouraging to read Mr. Naxon's description of the new era in business, for which foundations have been so well and so conservatively laid by the organization of the Chamber of Commerce of the United States of America. Surely we need not be despondent, so long as we have men who had the vision and the courage, *before* the present war, to establish right in Washington the machinery for co-operative work between business organizations, and between such organizations on the one hand and the Federal Government on the other hand. In this connection we should not fail to note that the business men of the country have cause for congratulation that thus far all tendency towards price fixing is under federal jurisdiction without the conflicts of state regulation which afflict the railroads.

Mr. Naxon's book is full of happy epigrams and fascinating quotations, and I think I cannot do better than to quote the following paragraphs:

"Business men live in the hour. Their apprehension is not so much as to the long future, as to the ills which may befall them individually as business men next year, or next month, or next week, or which have already afflicted them."

But later on, in describing the work of the United States Chamber of Commerce, he says:

"The possibility of inducing busy men to serve in this fashion arose from the intensely practical bearing on the subjects dealt with. Once entered upon, such service held even men of the heaviest personal responsibilities. It introduced them to a social delight and a mental stimulus novel to many—that of sitting around a board with other live men in a non-competitive atmosphere, exchanging ideas, deferring to one another's suggestions, earnestly striving together for the broadest view and the fittest action. Some such men asserted that committee experience in a board of trade under the new conditions enabled them to do their own work so much better that they were more than repaid for the time and strength expended."

A part of the final appeal is this exhilarating paragraph:

"In your face I can read that you would like to give yourself to your country's problems, but you haven't any plan to grab hold. Maybe not, but if not who are you? If you are an employee there is an organization of such employees. If you are a merchant or manufacturer there is a local business organization and a national trade body. If you follow a profession it has its society. Do you believe your organization is giving itself to the problem of preserving what you are thankful for? Do you believe your organization is for America first and for its special class second, or America nowhere? Have you thought enough about the aims and performances of your organization to have a belief about its effect upon the preservation of America as a land of freedom and opportunity?"

It is a book that every patriotic citizen may read with profit as well as pleasure, and every railway official ought to have a copy.

FRANK TRUMBULL.

THE INDIAN EQUIPMENT MARKET.—During the year 1916 eleven of the thirteen principal railway systems of India used equipment and supplies to the value of over £6,000,000 (\$29,160,000), of which £3,500,000 (\$17,010,000) worth came from England.

Letters to the Editor

MR. THELEN REPLIES TO OUR CRITICISMS

SAN FRANCISCO, Calif.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

My attention has been directed to an editorial in your issue of October 19, 1917, in which you refer to the president's annual address delivered by myself before the National Association of Railway and Utilities Commissioners in Washington, on October 16, 1917. In this editorial, you question certain statements of fact in my address and invite my reply.

1. *Five Per Cent Case.*

You ask me to point out where in its decision in the Five Per Cent Case the Interstate Commerce Commission refers to waste and inefficiency in railroad operation.

I am surprised that any one who has read this decision should make this inquiry.

After referring to methods of increasing railroad revenues, the Interstate Commerce Commission (Vol. 31, I. C. C. Rep., p. 351), at page 409, says:

"There are, however, other fruitful courses which the carrier may pursue to increase net revenues which would not involve any increased burdens upon the shippers and the traveling public. We refer, of course, to the introduction of additional economies in operation and further advances in efficiency, opportunity for which obviously exists in every department of railroading, as in other lines of business."

The commission then draws attention to a number of "the most promising fields for such efforts," including, among others, increase in car efficiency, greater economy in the use of fuel and other economies in operation.

Referring specifically to increase in freight car efficiency, the commission, at page 411, says:

"It is, however, in the use and operation of cars that we must look for the most substantial economies. Mr. Daly, general superintendent of the Illinois Central, found that, even in the busy season, a freight car was moving in trains on the road only 3½ days out of every 30. Taking the average of all roads in official classification territory for the whole year, the time a car is moving in trains probably does not exceed 3 days out of 30, and the car is under load only 2 out of those 3 days. Furthermore, the cars under load are loaded on an average to only about 58 per cent of their capacity."

Continuing, on page 412, the Commission says:

"As pointed out by Mr. Daly, the economies which may be effected by greater car efficiency have only begun to be realized. The possibility of reducing the empty car movement should be examined. It is believed that by more careful management and through reasonable changes in regulations and practices carloadings can be increased, and that both shippers' and carriers' detention of cars can be materially reduced. At the same time the congestion at terminals, which is in large part both the cause and the result of such detention, can be greatly lessened. The greatest cause of car detention is perhaps the lack of regularity in the movement of freight. Much advance can undoubtedly be made in the way of developing freight train schedules, both in the terminals and between the stations."

As I pointed out in my address, this waste and inefficiency have been greatly reduced by action of the railroads in distributing empty cars into districts where needed, increasing the daily mileage of locomotives and freight cars, reducing the number of locomotives and freight cars awaiting repairs in shops, and other measures, and by co-operation of the shippers in prompt loading, loading to capacity and prompt unloading of freight cars. As I also say:

"What the railroads are now doing is being patriotically done, and deserves and is receiving the unstinted praise and commendation of all American citizens."

You say in your editorial that you have searched in vain in the decision of the Interstate Commerce Commission for a single word pointing out the waste and inefficiency to which I referred in my address and you "boldly assert that there is no such word in it."

I suggest that if you will read the decision at the pages herein indicated your search will be rewarded.

2. *Federal Railroad Valuation.*

You say in your editorial that the railroads have not "favored" the federal railroad valuation, but that they have "acquiesced" in it "because they believed that the valuation would show that the railways as a whole were not over-capitalized."

I do not propose to split hairs with you over the difference between "favoring" and "acquiescing." The outstanding facts are that the executive and financial officials of most of the railroads are opposed to the valuation and that leading railroad officials have recently made repeated efforts to suspend the valuation. These efforts, as is generally known, were blocked by President Wilson and Secretary of War Baker.

I regret that the railroads are taking this attitude. As a basis for a constructive solution of our railroad problems, the American people are entitled to have the facts promptly and officially determined. The sooner the facts are determined, the sooner may we look forward to real progress in solving our railroad problems. In my opinion, it would be far wiser for the railroads to accept the situation than to try to suspend or stop the valuation.

3. *Duplication of Facilities, Service and Operating Expenses.*

You agree with me that duplication of railroad facilities, service and operating expenses exists and that the same should be eliminated, but object to my statement of the facts as a "criticism" of the railroads.

While accepting your concurrence as to the facts, I must respectfully protest against your reference to my statement as a "criticism" of the railroads. What I said was not said in a spirit of criticism of either the government or the railroads, each of whom is partly responsible for the situation, but was a bare statement of existing, admitted facts, as is shown by the very next sentence of my address, which you do not quote, reading:

"I am not now speaking of causes, but only of the facts which are patent to all."

As I point out in another part of my address, the events of the world war and the necessities of the peaceful competition with other nations which will come after the war, will cause our people to insist on greater efficiency in both public and private affairs. Our transportation system will be no exception to this general demand. The conditions which I pointed out and with which you agree do exist, must be remedied if our transportation system is to measure up to the standard of increased national efficiency, which the American people will imperatively demand after the war.

To the extent that legislation is responsible for existing waste and inefficiency in railroad operation, legislation must be changed. To the extent that the railroads are responsible, they must do their share of the work. I am in favor of such legislation as will cure for the past, as far as that may reasonably be done, and prevent for the future, unreasonable and unnecessary duplication of railroad facilities, service and operating expenses.

It is foolish to close our eyes to the facts and to criticize and attack those who are seeking to ascertain and analyze the facts as a basis for constructive remedies. In my opinion, it would be far wiser to stop trying to pick flaws and to work together, first, to ascertain the facts and, second, to make such improvements in the existing order of things as the facts and the welfare of our people require.

The whole spirit of the convention of the National Association of Railway and Utilities Commissioners was a patriotic endeavor to be of service in every possible way to the states and the nation at this time.

The state commissioners have determined to do two things in connection with our railroad problems:

1. To give every possible assistance to help with the war.

2. To ascertain the facts with reference to our railroad problem in its entirety so that after the war we may do our part as public officials in assisting to secure a wise and constructive solution of the problem in the light of a quickened national efficiency and the best interests of our people as a whole.

The Association directed the appointment of a Special War Committee whose duty it shall be to confer with all appropriate state and federal officials and to advise with each state commission to the end that each commission shall be of the greatest possible service to its state and the nation.

I suggest that this is not a time for petty criticism or bickering. Rather should all men through whose veins there runs the blood of patriotism forget their erstwhile contentions and present a common front so that in harmonious, concerted action the nation can be most effective in the present contest.

MAX THELEN.

President, Railroad Commission of California.

LIMITATIONS OF THE THREE-CYLINDER LOCOMOTIVE

BOMBAY, India.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I was much interested in E. Cecil Poultney's reference to the Pennsylvania Decapod type locomotive on page 1471 of the June 29 issue of the *Railway Age Gazette* and in his suggestion that three or four cylinders might have been substituted for two of the dimensions employed, particularly advocating the former arrangement.

I should be glad to think that the turning moment on the axles would be improved, and the chances of slip much reduced with three cylinders connected to cranks set 120 deg. apart. That is, of course, what one would set out to attain with three cylinders, but a little consideration will show its impossibility to any appreciable extent apart from the use of three coupling rods as well. Of course, three coupling rods (side rods) are impracticable, whether the third is placed between the frames and connected to a row of crank axles, or whether two couplings rods are placed outside the frames on one side, with two cylinders inside the frames and the third cylinder and coupling rod outside the frame at the other side.

Admitting that a more ideal arrangement for driving a single axle can hardly be desired than three cylinders, when it is attempted to transmit the even turning effort so obtained to a second axle it has to be performed by means of only two coupling rods. Those rods are set at an angle of 120 deg. and are therefore in a worse position for transmitting torque evenly than are the coupling rods of a two cylinder engine, which are set 90 deg. apart. The greater the number of coupled axles the greater the proportion of axles driven in this irregular manner. Even if the advantage gained in the driving axle be as much as 20 per cent over that possible with two cylinders, in a Decapod it forms only four per cent of the whole engine's tractive effort without making any allowance for the irregularity which applies to all the remaining coupled axles.

No doubt it is the appreciation of this point which has deterred designers from making greater use of three cylinders than is general. Conversely it follows, that the fewer the number of coupled axles the stronger the case for using three cylinders, until we come down to the single driver, for which a better arrangement need hardly be desired.

In a Decapod engine the inside cylinders must work on an incline something like one in four, leading to difficulties with the smoke-box apart from those introduced by this extreme angularity. I believe that any line having clearance for large enough cylinders would be well advised in

adhering to two cylinders until other considerations force the adoption of the three or four-cylinder arrangements.

But suppose that owing to a limiting axle load, as in England, a line should have to face the problem of deciding on an articulated express engine; having exceeded the capacity of their six-coupled passenger engines. The type which should develop for heavy passenger loads at high speeds to my mind could not be better than the six-cylinder double-ended articulated Garratt type having three cylinders at either end. Such an engine would possess good starting and accelerating ability; from the efficient use made of its adhesive weight by the three-cylinder arrangement it should equal in hauling and starting power a Decapod having the same diameter coupled wheels, were it practicable to build such a machine, and for speeds it would equal the Atlantic and absolutely surpass any other type having a greater number of coupled axles than two.

A. McBETH,

Assistant Locomotive Superintendent, Great Indian Peninsula Railway.

TYING-UP WITH THE MEN WITH THE COLORS

COLONIE, N. Y.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I have noted with much interest the move made by the supply men to furnish "tobacco" to the men of the engineer regiments.

You will be interested in an organization we have formed in the Delaware & Hudson shops here at Colonie, N. Y.

We have given about 70 of our men to army or navy, some to the engineer regiments and many to other parts of the service. Realizing that we at home also have a duty to perform, after sounding the sentiment of the shop, at a noon hour meeting, an organization was formed comprising practically to a man the full shop quota.

Its purpose is:

(1.) To furnish periodically—approximately once each month—while the war lasts, to each fellow Colonie man enlisted in the nation's service, tobacco or some token of remembrance, together with a shop letter.

(2.) To keep in touch with those left at home who may be wholly or partially dependent on our fellow Colonie men at the front to the end that where a helping hand may be needed it will unobtrusively be extended.

(3.) By these means—to give to our men the encouragement had with the knowledge that we are back of them to a man, evidencing clearly our realization that the problem is a mutual one, and that we are ready manfully to do our bit to lighten the burden.

We have also placed an honor board in a conspicuous place in the shop, giving the location of the men in the service, so any employee who may care to so do can write from time to time.

Committees were formed as follows: Honor Roll, Purchasing, Reading, Home Letters, Helping Hand and Printing, the committee's title indicating its purpose.

Don't you think that if every shop in the United States did the same it would be a splendid thing. Personally I do and am calling it to your attention because it is working so well here.

G. S. EDMONDS.

TRAFFIC ON THE SWEDISH RAILWAYS.—The company-owned Swedish railways showed an increase in receipts for the first six months of the present year as compared with the same period last year, of 18.4 per cent on the freight traffic and 9.5 per cent on the passenger traffic. The increase in the freight traffic receipts is exclusively due to the higher tariff, temporarily adopted. The private railways are contemplating a material reduction in the number of trains during the winter, while the state railways mean to meet the shortage of fuel problem by reducing the speed.



Driving the Temporary Bridge

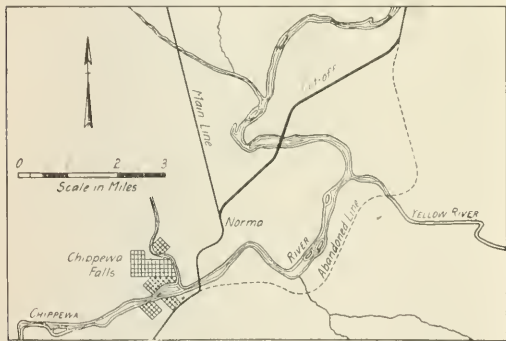
Bridge Work on the Hannibal Line Cut-off

Construction of a Reservoir Required the Relocation of a Part of the Chicago, St. Paul, Minneapolis & Omaha

THE construction of a reservoir by the Wisconsin-Minnesota Light & Power Company, at Chippewa Falls, Wis., caused the submergence of a part of the Hannibal branch of the Chicago, St. Paul, Minneapolis & Omaha and made it necessary for the railroad to abandon $9\frac{1}{2}$ miles of this line in favor of a cut-off built for it by the power company on a new location with the grade at a sufficient elevation to avoid inundation. The project involved

but involves a bridge across the Chippewa river, whereas the old location was entirely on the east side of the river.

The new line has a maximum grade of 0.5 per cent and offers no particular features of interest except the Chippewa river bridge which consists of eight 100-ft. deck plate girder spans on concrete piers and abutments, with an embankment approach 1,300 ft. long, averaging 40 ft. in height. The bridge and embankment have a level grade and are on a tangent, the base of the rail being 64 ft. above the bed of the river and 20 ft. above the water surface in the reservoir. This elevation allows a clearance of 8 ft. between the surface of the water and low iron of the spans.



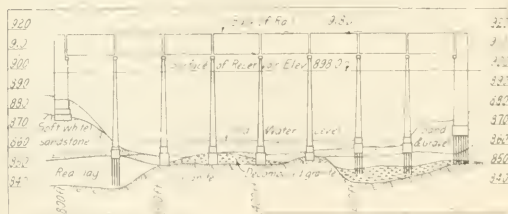
Map Showing the New and Old Lines

the construction of a bridge across the Chippewa river, which embodied some interesting engineering and construction features.

The Hannibal branch of the Chicago, St. Paul, Minneapolis & Omaha joins the Eau Claire-Duluth main line $\frac{3}{4}$ mile north of the Chippewa Falls depot, the branch line continuing along the east side of the river, while the main line turns north, crosses the river and rises on a one per cent grade for a distance of $1\frac{1}{4}$ miles to attain the elevation of the flat country back from the river. Only $2\frac{1}{2}$ miles of the Hannibal line was subject to submersion by the water in the reservoir, but the selection of a new location to avoid the water necessitated the abandoning of the line to a point 9.9 miles from the Chippewa Falls station where it was possible to secure a junction with a cut-off. The distance by way of the new line is 1.65 miles shorter than over the old line

THE SUBSTRUCTURE

Careful consideration was given to the examination of the ground for the foundations of the piers and abutments. By the use of an ordinary well-drilling machine, 4-in. test holes were drilled for each pier and abutment. The results of these operations proved interesting, and are shown on



Profile Showing Results of Borings

the chart. Overlying the solid granite were found various strata of decomposed granite, red clay, soft white sandstone, sand and gravel. Owing to the extreme depth of the granite at the sites of piers 1, 6 and 7 and the north abutment, it was decided to resort to pile foundations. The south abutment was built on a soft white sandstone, while the footings of piers 2, 3, 4 and 5 were founded on solid granite.

No difficulty was experienced in excavating for the foundations. Ordinary sheet piling proved sufficient for the shore piers and abutments and double timber cribs filled

with clay were sunk for the foundations of the river piers. These were made large enough to allow the driving of short sheet piling next to the inside walls of the cribs, in order to shut off water coming in between the uneven river bed and the bottom of the cribs.

While grading south of the bridge an excellent quality of gravel was uncovered in unlimited quantities. A crusher and screening plant was erected and the concrete material was thus obtained in the immediate vicinity of the bridge site. The concrete mixer plant was located near the south abutment and concrete was placed by means of an aerial cableway operated by machinery located near the south abutment. A low temporary trestle, driven parallel to the new bridge, was used for moving machinery and pile drivers, and also to some extent for handling concrete in foundations. Work on the bridge proper started early in the spring of 1916 and the concrete work was entirely finished in the latter part of September of that year.

THE SUPERSTRUCTURE

The 100-ft. girder spans were designed for Cooper's E-55 loading. They were contracted for delivery September 1, 1916, but the bridge company subsequently extended this date to December 1. As there was no absolute certainty of delivery on the later date and as the power company was obliged, through contract conditions for the delivery of electric current, to commence filling the new reservoir and thereby submerging the old Hannibal line it became necessary to adopt heroic means to put the new cut-off into commission. Accordingly it was decided to put in a temporary bridge. Early in November two pile drivers were started at the north and south ends of the bridge driving a pile trestle which was completed on November 30. Girder spans began to arrive, however, before the temporary structure was completed, and the work of erection was started in January, 1917, and was completed on February 16.

GRADING

Material for the embankment at the north end of bridge was all handled by a steam shovel and trains. The em-

completed track work at the junction points was attended to.

All waterways and underground cattle passes were constructed of reinforced concrete pipe, except at locations where the headroom was not sufficient, in which cases cast iron pipe was used. The underground cattle passes have a diameter of 84 in. The reinforced concrete pipe was furnished by the C. F. Massey Company, Chicago.

The entire work of constructing the cut-off was done for the Chicago, St. Paul, Minneapolis & Omaha by the Wisconsin-Minnesota Light & Power Company. The grading and concrete work was done under a contract by A. Guthrie & Co., St. Paul. The superstructure of the Chippewa river bridge was fabricated by the Wisconsin Iron & Bridge Company, Milwaukee, and erected by Frankman Brothers Com-



Placing a 100-Ft. Girder

pany of Minneapolis. The tracklaying and ballasting were done by forces organized for that purpose by the power company.

The work was done according to the standards of the Chicago, St. Paul, Minneapolis & Omaha under the direction of H. Rettinghouse, chief engineer, and A. E. Winter, assistant engineer, in immediate charge. We are indebted to the former for the above information concerning the project.

THE LOCOMOTIVE OF YESTERDAY.—A considerable proportion of the locomotive work performed every day on the railways of this country is done by engines which have long since passed out of what we can rightly term a modern category. Nevertheless, it is work of a most useful character, achieved as a rule in an economical manner. Though secondary in importance when viewed in comparison with main line services of the first class, the work is indispensable, and the retention of locomotives which have long since passed out of the modern standard is fully justified by the results obtained. In a great number of cases the engines have been rebuilt, and some of them have, indeed, lost practically all resemblance to their former selves. The modernizing tendency resulting from the rebuilding processes has increased the capacity of the locomotive in a wonderful degree, and those who criticize the policy of thus retaining in service older locomotives and bringing them up to what is practically a present day standard by rebuilding should remember that the material and workmanship put into the British locomotive of yesterday were of a very high class indeed, and there is greater economy in keeping the engine going than in scrapping it. On the other hand, there are on most railways numbers of locomotives which retain practically all the features they originally possessed, and it has been found better and cheaper to keep these at work than to send them to the scrap heap. Not only in branch line but in main line service there is a place for these many year old engines which, all things considered, could hardly be so well filled by types built in accordance with the most modern ideas.—*Railway Gazette, London.*



Concreting Piers from an Aerial Tramway

bankment was made entirely of gravel from deposits obtained within $\frac{1}{2}$ mile of the work. As the embankments stand in the reservoir, the slopes of both the north and south approaches were made 1 to 3, and riprap 1 ft. thick was placed to a line 5 ft. above the surface of the water in the reservoir.

The grading of the entire line, outside of the high embankment referred to, was very light and was completed early in the summer of 1916. The track was completed up to the bridge from both ends by the time the temporary bridge was put in. Most of the line was ballasted at that time, but the work had to be suspended on account of cold weather. Ballasting was resumed early in 1917, when un-

Railroad Discipline Without Suspensions

Philosophical Observations of a Chief Clerk Long
Familiar with Brown System. The Ideal Superintendent

By E. H. Heath,

Chief Clerk to Superintendent, Kansas Division, Chicago, Rock Island & Pacific, Herington, Kans.

IN these days of highly specialized industrial effort the opportunity for spectacular individual performances is largely over, and large results are obtained in a large way only by united endeavor and co-ordination of forces. Team work, concerted endeavor, is the life blood of productive effort, and any system of discipline which discourages team work is inimical to the best interests of the industry itself. By this test actual suspension as a means of discipline has no place among railroaders or any other body of intelligent men, because it violates their sense of justice, breeds disloyalty, fosters discontent, engenders dislike and alienates the sympathy and fidelity of employees, their families and their friends. Any punishment that interferes with the employee's earning capacity results in impairing his ability to discharge the obligations of good citizenship and to protect and educate his family. Discontent is unconsciously contagious. Actual suspension cannot be successfully defended upon grounds of either justice or expediency, and as a matter of fact is not consistently enforced upon lines retaining that system. As in civil and criminal law, where unduly severe penalties make convictions difficult, so in disciplinary matters the severe penalty violates the disciplinarian's sense of justice and the offense is more or less condoned.

It is the same in railroad life. Sympathy for the misfortunes and miseries of associates, always felt by a man worthy of leadership, causes the sentence to be suspended or overlooked.

At present the demand for labor exceeds the supply, and men who are worth anything cannot always be spared to serve disciplinary sentences. During these days of high prices, when employees, for the most part, live from hand to mouth, enforced idleness for a period of ten or twenty days would often pauperize the employee and his family. He will not stand this, but goes into the service of a competing line; or he goes into some other business, and is lost to the railroad industry.

We are dealing with men whose training enables them quickly to discern injustice and unfairness; and their extensive brotherhoods enable them quickly to reverse questionable discipline. Such reversals are necessarily inimical to the prestige and influence of the supervising officer in the field. No man may hope to stalk through the industrial world like an avenging god, exacting an eye for an eye or a tooth for a tooth, and retain the loyalty or even the respect of the intelligent workmen. Intelligent discipline is the handmaiden of education, rightly presupposing proper instruction. Helpful discipline cannot be divorced from education. It looks forward not backward. It concerns itself with the future rather than with the past. It is more interested in the glories of the dawn than in the grandeur of the crimson sunset. It is the epilogue to a prologue whose precursor is rightly effective educational and teaching effort.

WEAKNESS FROM NEGLECT OF INSTRUCTION

It is a lamentable fact that railroad instructional methods are woefully weak, depending largely upon circulars and bulletins which reach a comparatively small proportion of the men employed; are read by a less number, are studied and understood by a comparative few. Instructions not

received, not read and not understood have no educational value. For the most part, training and efficacious teaching have been left to the employee himself or to the loud-mouthed agitator, who breeds discontent, and tears down, never building up. Few of us in our years of service can recall a conscious, continuous effort on the part of anybody to teach us the railroad business. Look at the younger men today. In studying claims for losses and other lapses from proper performance it is almost always found that the responsibility rests on the man who did not know, or, if he did know, did not understand. He bills shipments by the wrong route. He fails to attach certificates which are necessary to permit the shipment to go to destination. He fails to enclose the waybill in the stop-off envelope when it is required. He violates standard practices and injures himself or others. In defense, he explains that he did not know. Somebody failed to teach him, or taught poorly. So long as the railroad industry is content to ignore the fertile field of educative effort and is willing to await the overt act, the industry will pay the penalty in lack of competent effort and efficient team work. The way out is high class, continuous, persistent instruction to spur the latent ambition and utilize the dormant capacity, heretofore largely squandered.

Take two divisions of the same railroad. The observer will not fail to note the contrast in methods, and the consequent gain to the industry, in passing from one division to the other, where the first depends largely upon bulletins, circulars, and notices for the dissemination of information and an understanding of instructions, while the other supplements this method by personal instruction, and by explanation through wide-awake committees. Efficiency comes through persistent instructions by an efficient field staff, explaining the why as well as the how. The writer is happy to add that his association with operating officers in this territory during recent years has been a liberal education as to what may be accomplished by continuous personal effort to reach the man in the field and fully develop his mental powers.

A lack of proper educational effort is evidenced whenever by reason of a dearth of talent it becomes necessary to officer a railroad from other industries, or to call upon so-called efficiency experts, with little railroad experience, to improve railroad methods among men who have devoted a life-time to the business. "Education" includes, of course, not alone intellectual training, but also cultivation of the instinct to create and the stimulation of pride in that creation; the willingness of the toiler to accept the responsibility for his own acts, to understand his relation to his coworkers and to the industry in which he is engaged; to co-operate.

THE NECESSARY ELEMENTS

"Record discipline," commonly called the Brown System, is usually applied to all station and yard employees, to trainmen, enginemen, foremen in all departments, signalmen, and others working on a monthly basis. It should not be applied to officers nor the personal staff of the operating officer, nor to ordinary laborers. It must not be confused with personal records kept by a pension bureau or for other reasons. Proper and continuous effort being made to secure men with a promise of capacity and willingness to learn the

railway business, the system should be designed to educate the ignorant, to arouse interest, and to inculcate the pride of good workmanship. The system should without unnecessary delay eliminate the hopelessly incompetent and those not responsive to proper educational effort.

Discipline should be uniform over the whole road, and should be managed by operating divisions. One officer on each division should assess and equalize discipline. All personal records should be kept in that office, junior officers retaining only seniority lists and other data necessary for their own use. These records should always be consulted before discipline is assessed, to determine the standing of the employee; whether this is the first offense of this nature, and whether similar offenses may not have been previously overlooked by reason of the employee's good record. Records should always be available where the complete record may be consulted by all junior officers as well as by the employee; and the employee should be encouraged to keep himself fully informed. All papers or copies thereof giving useful information relative to the employee should be filed on his personal record papers. Such records for convenience may consist of a card index, application and supporting papers bearing a corresponding number and a loose leaf. Loose leaves may be kept in book form or on the personal record file, on which should be tabulated all entries.

Discipline letters should describe the exact offense. A letter notifying the employee of discipline assessed for "delaying a passenger train," when the real offense was failure to clear the time of a first-class train at a station in the rear, as required by rule, is grossly improper, featuring as it does the minor phase of the offense and ignoring the vital element. Failure to act, as well as improper action, must be noticed, and disciplinary notices should state in clear, concise language the exact offense. Such letters should always show the total balance of the entries, and should be followed up and an acknowledgment secured.

When the entries approach the final maximum the employee should be called in and cautioned, and a memorandum of that admonishment placed on his record. The record being correctly and impartially kept, tells the tale of the man's unfitness for the railway business, and he should be promptly removed; and unless there is a grave need by reason of shortage of men, should not be re-employed in any capacity on that road. Sufficiently close relations should be maintained with a central office in which is kept the record of applicants previously employed. At the end of each month an educational bulletin should be issued, correctly describing the offense, omitting names, places and dates, and showing all discipline assessed, as well as briefly outlining correct procedure.

In assessing discipline give consideration to the employee's previous record, his willingness to acknowledge the fault, and to concede correct conclusions; his determination to avoid repetition, readiness to promise betterment, to correctly analyze the occurrence and to lay the facts before his superior officer with frankness. A careful record should be made to show what consideration has been given to the man's history, to the end that undue credit may not be given a second time.

I am well aware of the argument that a given act merits the same discipline every time, regardless of the individual, and that the consideration here advocated is improper. But such consideration is actually given, consciously or unconsciously, whether we say so or not; and it is entirely right and proper. Otherwise the most potent reasons for co-operative effort would disappear.

PRECAUTIONS TO BE OBSERVED

The disciplinarian should properly be careful that the discipline assessed is proportionate to the seriousness of

the offense, the individuals involved and the circumstances surrounding the case. Manifestly, to assess ten demerit marks for violation of Rule 99 and thirty for failure to forward a certain report on time is so grotesque and unfair as to excite only rebellion and contempt; although it is conceivable that at times the continuation and repetition of small offenses may merit drastic action. A yard conductor, for example, in pushing cars into a yard track fails to send a field man to the farther end of the cut of cars already on that track, to insure against shoving out at the other end and colliding with a movement being made on the main or ladder track; or against part of the cut breaking off and running out on the main line. The first time this occurs an understanding is had with the offender and possibly minimum discipline is assessed. Clearly, the same discipline is inapplicable if the offense is repeated; for it is evident that it was ineffective; more drastic action must now be taken. Should the offense be repeated a third or a fourth time, the employee, presumably, lacks inclination or adaptability, or both, and should be removed. He cannot be retained without making careless, by example, those whose intentions are right.

To be effective, discipline must be certain and sure. The certainty that the employee will be called upon to explain improper operation will be found more of a deterrent than severe discipline occasionally applied. All discipline should be handled in a straightforward, open, aboveboard, manly way, impressing upon those concerned that the road is paying first-class wages, provides first-class working conditions, high class courteous treatment, and is entitled to high class service; and that nothing less will do. Effective team work implies that the division officer knows his men and is able to call them by name. He acts on the assumption that the man involved is worthy and is a satisfactory employee; meets him in a frank, candid and proper way, and explains that the railroad has spent much time and money for facilities to permit safe operation; has facilities equal to other lines and superior to many; has issued rules and instructions prescribing proper methods and performances; has spent time and money educating him, and has an investment in him. Dealing with an accident, he points out that, regardless of what caused it, whether haste or ignorance, the employee has violated this or that rule, or has failed to do this or that; that the road is paying first-class wages and expects first-class service, which, in this case, it did not receive; and he calls for adequate assurance for future performance. He takes time enough to impress this on the man's reason; does not try to stuff it down his throat. The employee acknowledges, promises and delivers. A capable, satisfied workman is retained, who will be an asset to the service.

In distressing contrast is the opposite handling. The employee explains the accident by saying, in substance, for example, "we were backing in over a bad turnout, which had been reported two or three times; the car that left the rails turned crossways; I couldn't get a signal to the engineer because of steam blowing bad, a difficulty which was reported the last three trips; there was no field man out, as I had two students who knew nothing, and I was alone; had been on duty over fifteen hours every trip for the last week." To all this the investigator replies, curtly, "You knew these conditions; they are the best we can do; you signed an application to do this work. I have nothing further for you." Here a bad condition is made infinitely worse by lack of frankness, candor and leadership. If the man is retained, he is dissatisfied, feels abused and is a liability. If he is not retained, the road loses its investment of time and money in his education.

Nor is it necessary or desirable that a decision unfavorable to the employee shall follow every interview or inves-

tigation; the opportunity to explain will, in many cases, be a sufficient deterrent; but the certainty that the explanation must be forthcoming will be found to have a far-reaching effect. Effective discipline is necessarily prompt. Immediate investigations, at the end of the trip or round trip or day, prompt decisions, immediately effective, give the action of the superintendent an impressive effect and businesslike character that is largely lost where the investigation, decision or action is drawn out through months or weeks. A delay of so little as three or four days, if unnecessary, has a bad effect. Every officer of experience knows that uncertainty as to what may be the final action will sometimes unfit a man for safe work.

OFFICER MUST BE FAIR AND PATIENT

Effective discipline moreover is fair and just. The discipline must appeal to the employee's American sense of fair play, otherwise it will excite his resentment and contempt. It must, however, be sufficiently drastic to impress upon him the necessity of "playing the game according to the rules," and to accept the responsibility for his own acts. It must demonstrate to the employee of right intentions that the management will be quick to distinguish real capability from the effort of the man whose ambition is so poor that he does just enough to "get by."

Generally speaking, discipline should never be assessed without a personal interview and an opportunity given to the employee to defend his position or explain his actions. The right to be heard in his own behalf is so fundamental and so ingrained in the American mind, resting as it does on the basic rights of man, that it cannot be ignored. The employee in that interview should be made to acknowledge his transgression and be told the superintendent's decision. The letter he later receives merely confirms what he has been told. There is no one thing that breeds disloyalty so quickly, that stings so venomously or that time erases so slowly as the receipt of a letter containing scathing criticism (or in fact, any adverse decision) without a previous opportunity for defense. It is a happy thing to the writer, however, that he has always been associated with men who investigate first, discipline afterwards. Long-distance mail order discipline is a sure indication of a lack of reasonable understanding of men. The failure to understand this basic and fundamental principle will be a fatal defect in what may otherwise be a fine and efficient organization.

THE IDEAL OFFICER

Fundamental in all discipline is the character of the man in the field who is responsible for the operation of the business. He must have the proper qualities of leadership, must secure proper co-operation, and weld his organization together to work as a unit. Such a leader must possess a thorough knowledge of the business he supervises and a wide knowledge of men, having an intimate personal knowledge of those who form his organization, and their condition of life. It is lamentably true and a serious loss to the business that our supervising officers as a rule have no intimate and personal touch with the lives of the men they supervise. The duties of junior officers are so many and so pressing that this intimate touch has largely been lost.

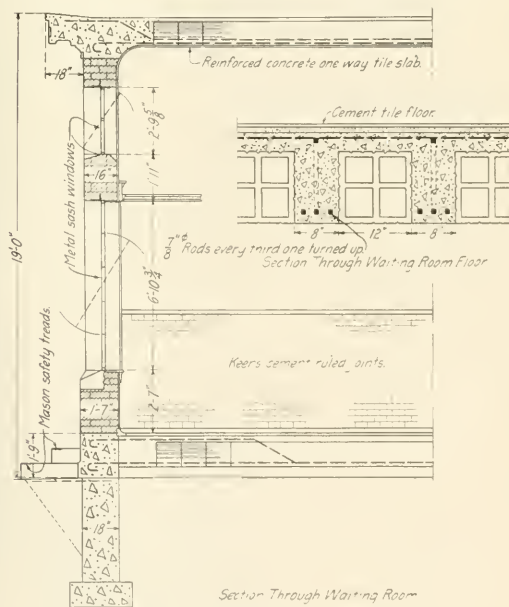
The vital element of team work is lacking when a division officer, happening to be at some small station, fails to recognize the section foreman who is surfacing track only a hundred feet away; or who as a matter of formality inquires after the health of the agent's wife only to learn that she died thirty days before. What can you say of a train master, accompanying the pay car, who finds himself embarrassed by being unable to identify the men he supervises? To create a really fine atmosphere of co-operation, the officer, in passing over the road and meeting those in the field, should be able to call the employee by name, and

to talk about his family in their respective walks of life; as to how the daughter is getting along teaching, or if the son is attending the university this year.

Let no one think, however, that these graces take the place of everyday business ability. The ideal leader is a suave diplomat, versed in finesse; but also he is acquainted fully with his work and ready at any time or place to issue proper instructions or to render decisions pertaining to matters within his jurisdiction. He is invaluable. His ideals must be high, but not unattainable; his methods correct, his intentions and motives exemplary and manifest; his life worthy and inspiring. He is master of men by right of education and personality. Always the courteous gentleman, he instructs without egotism, rules without malice, censures without sting, disciplines without personal feeling, commends where commendation is due. He sees that employees deliver value received; and that they, in turn, are accorded fair and honest treatment. Their working conditions are as near right as he can make them, and he sees that their contracts are observed. He is not a prosecuting attorney, nor is he attorney for the defense. He rules by reason and sometimes with an iron hand; but he never forgets the velvet glove. He performs many and varied duties, but always he teaches, teaches, teaches.

A SUBSTANTIAL DESIGN FOR A SMALL STATION

The Chicago, St. Paul, Minneapolis & Omaha, recently completed a passenger station at Marshfield, Wis., which illustrates a type of construction readily applicable to passenger stations of moderate size, that will insure long life,



Structural Details of the Building

high fire resistance and low maintenance costs. These results were secured without detracting from the interior or exterior appearance, but in reality adding to the effectiveness of the design.

The station is one story in height and follows the usual

floor layout of small passenger depots, with the agent's office in the center of the building, a baggage room, an express room and a trainmen's room at one end, and waiting rooms

The structure was designed under the direction of H. Rettinghouse, chief engineer, of the Chicago, St. Paul, Minneapolis & Omaha, by H. P. Padley, principal assistant engi-



Exterior View of the New Station

at the other end, the main waiting room being adjacent to the office, with separate accommodations for men and women at the extreme end. The roof of the building is flat but is broken up into three different levels. The roof over the agent's office is 22 ft. above the platform to give headroom for a record vault on the second floor; the main waiting room has a height of 16 ft. to permit the installation of windows above the level of the canopy roof on the track side, while the wings containing the baggage and express rooms and the women's room and smoking room have ceiling heights of 13 ft.

The foundation walls are concrete. In the baggage room end of the building the floors consist of concrete slabs 6 ft. square, placed on sand filling. In the remaining portions of the building the floors are of reinforced concrete, of one way tile construction as illustrated in the drawing. They consist of slabs 3 in. thick carried by girders 8 in. wide by 12 in. deep, spaced 20 in. center to center, the space between these girders being occupied by rows of 12-in. hollow tile blocks. The floors are covered with cement tile, finished at the walls by a terrazzo cove. The same form of construction is used for the roof, except that the girders and the hollow tiles are only 6 in. deep, so that the total depth of the roof slabs is only 9 in. as compared with 15 in. for the floor.

The roof is flat except for a slight pitch to gutters on the line of the inside faces of the walls, these gutters draining to down spouts carried down on the inside of the building. This insures that the down spouts will not freeze up, and as the gutters are kept away from the copings of the roof all danger of dripping or of icicles over the face of the coping is eliminated. The walls are of brick faced with a tapestry brick, trimmed with a coping of dark-colored terra cotta. A canopy is provided on the track side of the building for the length of the main waiting room portion which consists of a reinforced concrete slab supported on reinforced concrete brackets. The windows have steel sash with horizontally-pivoted ventilators.

The interior walls and ceilings are covered with plaster, a wainscot of Keen's cement plaster with ruled joints being provided in the waiting rooms. The only woodwork used is in the upper trim of the window openings and the doors and door trim.

neer and architect. The Charles W. Gindele Company of Chicago was the general contractor.



The Crater Zone in the West

The difficulty of accelerating a pursuit under modern war conditions is strikingly illustrated in this photograph, which shows a railroad station and a section of a railroad completely obliterated by shell fire. What once was an even and solid roadbed is now a shambles of debris and craters, which must be bridged before any attempt at pursuing the enemy can be made.

Railway Regulation and Control

Newlands Committee Hears Issue of Transcontinental Rates. Rigid Long and Short Haul Clause Urged

SAN FRANCISCO, Cal., November 10, 1917.

THE hearings at San Francisco before the Newlands Joint Committee on Interstate Commerce were concluded on Saturday, November 10. After the cross-examination of Max Thelen of the California commission had been completed and a number of other state commissioners had been heard on the problems which the committee is studying, relating to the method of railroad regulation, the hearing developed into a controversy between the representatives of the Pacific coast shippers and the representatives of the intermountain territory regarding the adjustment of transcontinental freight rates. As no other witnesses appeared to throw light on the problem of regulation or government ownership it was decided to adjourn and hold further hearings later in Washington. The time for the committee's report was extended for a year by Congress shortly before it adjourned.

The old issue as to transcontinental rates was raised by the representatives of the intermountain interests, who expressed extreme dissatisfaction with the results of the Interstate Commerce Commission's various decisions in the case since it was given discretion, under the amendment of the long and short haul clause in the fourth section of the commerce act in 1910, to determine the extent to which the roads might depart from a rigid observance of the long and short haul rule. They declared that they had received no relief at the hands of the commission and insisted that Congress should take the matter out of the commission's hands by making the fourth section an absolute prohibition against the charging of a higher rate for the shorter distance than for the longer distance. They were so bitter in their complaints against the railroads and the commission that the members of the committee were led for a time to believe that the commission had done nothing in the seven years since the amendment was passed, until the representatives of the coast shippers arose to defend the coast terminal rates based on water competition and explained that when an intermountain man talks about "relief" he means nothing less than a reduction of the intermountain rates to the level of the terminal rates. The commission has ordered some drastic reductions in the intermountain rates and in its decision of June 30 ordered a readjustment either by a reduction of the intermediate rates or by an increase of the coast rates during the period, while water competition is in abeyance during the war, but this order has been suspended and the case reopened because the railroads elected to raise the coast rates and the recent action of Congress prohibited the filing of increased tariffs without the approval of the commission. Hearings are now being held on the new rates.

INTERMOUNTAIN TESTIMONY

F. A. Jones, chairman of the Arizona Corporation Commission, began the argument for a rigid long and short haul clause on November 3. He said the intermountain country had hoped that when Congress amended the law in 1910 they would be relieved of the discrimination caused by the lower rates to the coast but that it had about come to the conclusion that it had little to hope for from the commission. He argued that any rate that would be compensatory from the east to the Pacific coast would be amply compensatory for the shorter haul to the intermediate country which does not involve the haul of 500 to 1,000 miles over the mountains. He declared that the discrimination has greatly retarded the development of the intermountain region and that the railroads have sacrificed millions in revenues which

they might have received from higher rates to the coast as well as from a greater traffic to and from the intermediate country. He thought that a solution of the problem might be afforded by giving the Interstate Commerce Commission jurisdiction over water as well as rail rates. He said that the intermountain people generally favored an absolute long and short haul clause, but, personally, he would not object to some exemption on account of water competition. Mr. Jones also took occasion to object to the federal commission's being given jurisdiction over state rates, and to any general curtailment of the power of the states. He said that 90 per cent of the work of the state commissions is handled informally and that the people secure better results than could be obtained if they had to go to the Interstate Commerce Commission. He favored a plan of co-operation between the federal and state commissions in matters involving a conflict of rates but thought that many matters of service, and such matters as the length of trains, hours of labor, safety appliances and securities might be better handled by the federal government.

He was followed by Edward P. Troy, of the Public Ownership Association, who said he wanted to "enlighten" the committee on the subject of government ownership. He entertained the committee for two or three hours with a violent tirade against the railroads and corporations generally.

The long and short haul controversy was renewed on November 5 by W. M. Gardner, vice-president of the Reno Commercial Club, who got both the committee and himself so tangled up in the mazes of the history of the transcontinental rate cases that it took most of the next day and several additional witnesses with less oratorical ability, but with a better knowledge of the subject, to straighten it out. Mr. Gardner got into difficulties by starting out with the claim that the Interstate Commerce Commission had given the intermountain country no relief and that it had delayed its decision for seven years and then postponed it again. When the members of the Congressional committee became curious as to what the commission had been doing all that time, he admitted that the rates had been somewhat reduced but asserted that they were still too high to enable the intermountain cities to do a legitimate business. He said they were discriminated against not only on traffic from the east but also in the eastbound distributing rates, which he said enabled San Francisco jobbers to put goods into Nevada at lower rates than Reno could. He insisted that the discrimination was intentional for the purpose of favoring the coast jobbers and declared that it is "time for Congress to dissolve the jobbing trust which is maintained by permission of the Interstate Commerce Commission." He did not include in the conspiracy the Providence that located Reno in a desert instead of on tidewater. He said that he was not unsympathetic with the railroads and that if it were necessary to help win the war the intermountain country would cheerfully pay double rates if the coast cities were required to pay the same, but that until the discrimination is removed the people of Nevada are prepared to "use every club that is available" against the railroads. He said that instead of suspending its order of June 30 the commission should have reduced the intermediate rates instead of giving the roads a chance to apply for higher coast rates.

Members of the committee cross-examined the witness at length in the effort to find out what the Interstate Commerce Commission had done with the case. Senator Cummins and Representative Adamson seemed to find difficulty in un-

derstanding why San Francisco was any more entitled to the benefits of a favorable location on the sea than the intermountain country to its advantage of a shorter distance from the eastern manufacturing points. Alfred P. Thom, counsel for the Railway Executives' Advisory Committee, asked if the real criticism of the witness was not against the administration of the existing law and if he was not driven to advocating an absolute law by disappointment as to the results obtained under the existing law. The witness replied that he objected both to the administration of the law and to the way the roads had delayed it.

W. S. McCarthy, representing the Traffic Bureau of Utah, took up the fight for the intermountain country on November 6. He also presented a telegram from the Idaho Public Utilities Commission asking him to represent it in opposing a curtailment of the powers of the state commissions and the extension of the authority of the federal government, and in urging an absolute long and short haul law. He declared that the exemptions authorized by the commission have resulted in gross abuses and that Congress never intended that an adjustment of rates covering one-third of the United States should be regarded as a special case in the meaning of the law. His contention was that either the present terminal rates are reasonable without regard in water competition or that they are so low as to place a burden on the traffic of the interior and that the rates now applied to the coast should be amply compensatory when applied to the shorter haul when the roads are relieved of the haul of 800 miles from Salt Lake to the coast over a summit of 7,000 feet. He said the carriers had voluntarily made rates to the coast on iron and steel articles as low as 1.77 and 3.54 mills per ton mile while the rates to the interior are 10.84 per ton mile, and that although a large part of the traffic of the Central Pacific is carried for what the roads call unremunerative rates, its net earnings per mile are greater than those of four lines between Chicago and Omaha combined. He said the railroads would have plenty of traffic if they abandoned the water competitive freight to the boats and confined themselves to natural rail traffic and the inland haul from the ports.

TESTIMONY OF COAST SHIPPERS

H. M. Wade, representing the Oakland Chamber of Commerce, defended the lower rates to the coast, saying that the rates were originally fixed by water and that the intermediate points had benefited by it because their rates were also fixed with reference to the water rates. He thought the coast was entitled to the benefit of water-compelled rates even while the water competition is in suspense, on the ground that investments have been made on the assumption of the old adjustment and he declared that the intermountain cities are trying to get something which it is not possible for them to have because of their location.

Seth Mann, attorney and manager of the traffic bureau of the San Francisco Chamber of Commerce, outlined the history of the transcontinental rate litigation and defended the water-competitive adjustment in a statement which Senator Cummins pronounced the most lucid he had ever heard on the subject. The coast shippers, he said, feel that the adjustment is primarily one for the railroads to defend; they have asserted no right or title to lower rates, but they are situated upon the unmonopolizable highway of the sea, and if the railroads desire their traffic it is for them to endeavor to secure permission to meet the water rates. The discrimination is not an unlawful one and the principles on which the roads have acted have been sustained by a line of decisions of the Interstate Commerce Commission for 25 years. He then outlined each of these decisions to show that the commission had not been entirely negligent during that time and to show that the discrimination had been gradually reduced. He declared that the situation can never be per-

manently settled because it is continually changing, although he did not expect that either the rail rates or the water rates would ever be as low as they were two years ago because of the increase in the cost of operation. He said that San Francisco felt no spirit of rivalry toward Reno, but regarded it as one of its best customers and hoped for its prosperity. San Francisco's real rivals are the great jobbing centers such as Chicago and St. Louis, but the great interest of the coast is in developing a manufacturing business and in securing a supply of raw materials on favorable terms. The intermountain country should not object to the rail carriers taking freight that would otherwise go by water and the existence of the water makes the intermountain rates lower than they otherwise would be.

EXCLUSIVE FEDERAL REGULATION ADVOCATED

Mr. Mann also advocated a plan of federal incorporation of interstate railroads and an extension of the jurisdiction of the Interstate Commerce Commission to cover the intrastate rates which have an effect on interstate commerce. He also favored federal supervision of railroad security issues and said that the San Francisco Chamber of Commerce had voted in favor of the federal regulation plan in the referendum conducted by the Chamber of Commerce of the United States. As much of his testimony was devoted to the rate controversy Mr. Mann said that possibly a representative of his organization would appear before the committee later to discuss the question of regulation. If the state railroad commissions of all states were of the same high type and character as the California commission, Mr. Mann said, he thought there would be little agitation for a change from the present system of regulation, but in many states the results secured from state regulation are not so good and the tendency of modern times is toward a unionizing of governmental authority. No question of state rights is involved in an extension of the authority of the federal government because its powers in that field are plenary. Representative Adamson asked the witness if other states did not believe that their commissions were as good as the California commission. To this Mr. Mann replied that if they did think so he would have to differ with them. A system of federal incorporation, he said, would clarify many questions arising from the differences in the provisions of railroad charters which cause confusion in regulation and while Congress could give the Interstate Commerce Commission jurisdiction over state rates without federal incorporation he thought that such a plan would present the simplest method and that if the commission were given such jurisdiction the rate situation would be much clarified. There is no question as to the power of Congress to legislate as to state rates which affect interstate traffic; the question is purely one of policy and he had come to the conclusion, after careful consideration, that in the interest of efficiency it would be the best policy for the federal government to have exclusive control of the rates of interstate carriers.

The 15 per cent rate advance case before the Interstate Commerce Commission, Mr. Mann said, illustrated the great possibilities for conflict between federal and state rate regulation. If the federal commission should find that the railroads were entitled to the advance while the state authorities decided differently as to the state rates a serious conflict would immediately arise, and as there were representatives of nine state commissions participating in the case to oppose the request of the roads it was probable that they would have denied an advance even if the Interstate Commission had allowed it. Traffic situations themselves are not affected by state lines, Mr. Mann said, and therefore the rate situation should not be so affected. The proposed plan of federal regulation would result in a great improvement. He also favored the plan of regional commissions but thought that they should each include representatives of each state with-

in their districts who should be intimately familiar with local conditions. Asked by Representative Sims whether he thought the states would willingly surrender their authority over rates to the federal government, Mr. Mann replied that he believed that when the people are educated to an understanding of the situation they would favor such a plan, although they might not be ready to do so now. He added that under a plan of government ownership the railroads would undoubtedly be managed entirely by the federal government and that the states would lose all jurisdiction over them.

Members of the committee displayed great interest in the rate controversy and questioned Mr. Mann as well as other witnesses very closely. Senator Cummins asked what he thought the government would do if it owned both the railroads and the waterlines operating through the canal. Mr. Mann replied that he thought that for the greatest good of the greatest number it would make no substantial change in the present methods of adjusting rates and that while the Interstate Commerce Commission has made many rate changes it has accepted substantially the principles applied by the roads. If the roads were required to cease meeting water competition, he said, so much of the coast traffic, in normal times, would move by water that the railroads would be reduced substantially to an express service and the effect on their revenues would be disastrous. It would be unwise for the government to impose any artificial restrictions. He opposed the idea that the government should also regulate water rates on the ground that while the railroads are inherently subject to regulation there is no monopoly principle in sea transportation.

Percy P. Powell, representing the Spokane Chamber of Commerce, testified from the Spokane point of view regarding the rate controversy and advocated an absolute long and short haul clause. He said that while the commission's latest decision would remove the discrimination Spokane would not be completely satisfied with an advance in the coast rates but wanted its own rates reduced. He made much of the fact, as other witnesses had, that the terminal lines receive, as their division of the rates, all of the excess to the intermediate points, none of it going to the lines east of St. Paul, and he contended that if the coast rate did not represent an actual loss the intermediate rate was certainly excessive.

H. F. Bartine, chairman of the Nevada commission, gave similar testimony in support of his argument for a rigid long and short haul clause. He said he was not contending that the Southern Pacific earns too much money but that it is getting too great a proportion of it from the state of Nevada, and that San Francisco was trying to keep Reno as "one of its customers" instead of allowing it to become a distributing center on its own account. He admitted water competition but insisted that it was not controlling and that the terminal rates would be sufficiently remunerative if applied to the intermediate points, citing an example of an 80-cent rate to the coast which the roads had declared to be unremunerative but which they had reduced after the canal was opened to 55 cents. He said that no one could tell when the water traffic would return to the canal and that the water competition now should be ignored.

In reply to questions by Chairman Newlands, Judge Bartine said that the railroads should be allowed to go just as far, in meeting water competition, as they can without discrimination against the people who do not have water competition, and he thought that in the end the Southern Pacific would profit more by trying to build up Nevada than by discriminating against it in favor of the coast.

Senator Newlands said he believed in the full development of water traffic and thought it had been a mistake to allow railroads to absorb water traffic to the impairment of the water carriers, but that he was anxious to promote water

traffic without any violent wrench of existing conditions. He thought conditions might now be improved without doing injury to any section and asked whether the latest order of the Interstate Commerce Commission, if put into effect, would not be sufficiently satisfactory to the intermountain people to obviate the need for legislation. Mr. Bartine replied that the order would be satisfactory if it were applied without delay and if it could be expected to be permanent, but that it left them at the mercy of the commission because it was liable to be changed upon the return of water competition. As long as the order is in effect, he said, it would be just as good as a rigid long and short haul clause.

S. J. Wetrick, attorney and manager of the transportation bureau of the Seattle Chamber of Commerce, and also representing the Tacoma Commercial Club, defended the present rate adjustment, emphasizing the fact that it had been sustained in principle by the Interstate Commerce Commission, an expert body, and by practically all economists and experts who have studied it. He said that if the railroads are able to handle water-competitive freight at anything above the direct out-of-pocket expense, the benefit reacts to the advantage of the intermountain country by diminishing the rate they would otherwise have to pay.

Those of the committee who attended the San Francisco hearing were Senators Newlands and Cummins and Representatives Adamson, Esch and Sims. A large number of railroad officials and shippers were present during most of the sessions.

On November 7 the committee members were the guests of the San Francisco Transportation Club at a luncheon. Alfred P. Thom, counsel for the Railway Executives' Advisory Committee, gave a short address on the need for a constructive policy of railway regulation. "The railroads must be regulated," he said. "Their influence is too great for the government not to control it. But, as the government has 'got over' us the time has come when it must 'get under' us with its protective care and assure to the man who puts his money into the railroad business justice and protection."

Numerous plans and suggestions have been filed with the committee without oral testimony. One of these is in the form of a pamphlet by W. W. Cook, general counsel of the Mackay Companies, outlining his plan for the creation of five regional operating and holding companies with directors to be appointed by a Federal Railroad Board to be appointed by the President. The plan contemplates that the holding companies shall gradually acquire the existing railroads, by exchange of stock or by condemnation, and that three per cent dividends shall be guaranteed on the stock of the federal railroad companies by the government, all earnings over six per cent to go to the government. This plan is advocated by Mr. Cook as a substitute for government ownership possessing its advantages without its disadvantages.

William McCrae, of Spokane, and also representing the Commercial Club of Boise, Idaho, advocated a rigid long and short haul clause, saying nine states in the union have such laws. He cited the case of a bank building in which the freight on the materials cost \$35,000 more than if it had been built on the Coast.

Fred P. Gregson, traffic manager of the Associated Jobbers of Los Angeles, said that if the roads were obliged to give up the terminal traffic to the boat lines the weaker roads, such as the Los Angeles & Salt Lake and the Western Pacific, could not live, because their earnings from local traffic would not permit the movement of one train a week, but that the lines were needed to give California an outlet for its products of the soil which must move principally by rail, because of their character.

Mr. Gregson said his organization was in favor of federal regulation of securities, but that it had secured such satisfactory results from the California commission that it did not believe in the plan of exclusive federal regulation of

rates. This, he said, would require the tearing down of the present machinery and the building up of new. He would prefer regional commissions to the present method of the Interstate Commerce Commission of delegating so much of its work to examiners unless the commission could secure more competent examiners.

G. J. Bradley, secretary of the Merchants' & Manufacturers' Association of Sacramento, although representing a city that now pays the higher intermediate rates, strongly defended the present adjustment and said that it is better for the intermountain country than the plan they seek. He thought it a mistake to agitate for a rigid long and short haul clause, because such a step would disturb rates and disrupt business in all parts of the country. He thought that the Interstate Commerce Commission, in passing on the thousands of applications of the railroads for relief from the fourth section, had established a scientific basis of rates and had permitted violations of the long and short haul principle only where it was to the best interest of the country to do so. Mr. Bradley said his organization was in favor of federal regulation of securities, but thought the Interstate Commerce Commission now had sufficient authority over rates.

J. N. Gillette, ex-governor of California, strongly advocated exclusive federal regulation and the elimination of the authority of state commissions over interstate carriers. He said the primary interest of the people is in adequate service and that this could only be brought about by a definite constructive policy of federal control which would enable the roads to know where they stand.

The railroads must have an adequate surplus, he declared, and this can only come from fair rates. The commission should have jurisdiction over the relations between employers and employees, he said, because Congress is charged with the regulation of commerce and "it is a helpless government indeed that cannot prevent an organization of men from interrupting commerce." The railroads should have the initiative as to new construction, but the commission should have some control over their expenditures.

R. N. Lynch, representing the San Francisco Chamber of Commerce, said the organization had voted in favor of exclusive federal regulation in the recent referendum of the Chamber of Commerce of the United States, and he thought that practically the entire rate-making power over interstate roads should be in the hands of the Interstate Commerce Commission.

Isador Jacobs, president of the California Canneries Company, said that the intermountain communities are taking a very narrow view of the rate situation, and that the development of trade must always proceed from the large centers, which are always established by water competition. He thought that the railroad service had broken down on account of the great demands now imposed upon it, and that it probably would be necessary for the government to take over the roads during the war, and that as for normal times it must do something to improve railroad credit in order to attract the investment of the necessary capital. Either the government must own the roads and operate them, or own them and leave their operation to private corporations, he said, or it must guarantee a reasonable return on the investment. He also suggested that the government loan the roads one or two billion dollars. He thought the roads were probably doing the best they can under the conditions.

James Keller, of the Pacific Portland Cement Company, which has plants both in the intermountain country and near the coast, said that a rigid long and short haul clause would work to the detriment of the intermountain country by closing up plants which his company is operating, and which could not operate unless it were given rates in violation of the strict long and short haul rule. The proposed leveling of the coast and interior rates, he said, will merely take business away from San Francisco and Sacramento and give it

to Chicago and St. Louis rather than help build up the interior.

The committee adjourned to meet in Washington at the call of the chairman.

DECAY RESISTANCE OF SOUTHERN PINE

The two chief requisites for the proper use of timber for construction purposes are strength and resistance to decay. The density rule, which has been adopted by the American Society for Testing Materials and the American Railway Engineering Association provides a means for indicating the strength of Southern pine timber, but very little has been known regarding the relative resistance to decay of the different species of this timber. Recognizing the importance of this subject, the Southern Pine Association established a technical scholarship at the Missouri Botanical Gardens for the purpose of making a careful investigation of the relation of the physical and chemical properties influencing resistance to decay. This investigation has been conducted by Sanford M. Zeller, who has outlined the experiments and the results which he has secured in bulletin No. 198, of the American Railway Engineering Association which has just been issued.

The conclusions indicate that in the selection of high grade bridge materials of Southern pine the density factor is not only a safe guide to strength but also to resistance to decay, provided sufficient restrictions as to sapwood are incorporated, and that the present rules of the American Railway Engineering Association regarding sapwood and heartwood fulfill this requirement.

The experiments were conducted with three species of yellow pine, for each of which special attention was given to the physical properties of the different samples as to resin content, specific gravity, percentage of summer wood, the width of the growth rings or the number of rings per inch, the sap and heartwood, and the distance of the sample from the pith. The following conclusions were drawn from this study. (1) Resin is no safe index of the durability of the three species of yellow pine investigated. (2) The specific gravity or density of the wood materially influences the resistance to decay of the heartwood—the more dense the wood being, the more durable it is. (3) Specific gravity, however, is a property which can not be determined from inspection, but it can be estimated by recourse to the proportion of summer wood to spring wood in the growth rings, which proves to be a safe criterion of the durability of heartwood; i. e., an increase in summer wood results in an increase in specific gravity. (4) The width of the growth rings furnishes a further index of durability, the narrower rings showing more resistance to fungous attack than broad, open rings. (5) The age, or distance from the pith of heartwood, shows no relation to durability at least up to 16 in. in diameter. (6) Sapwood decays irrespective of resin content, specific gravity, width of the annual rings, or species of pine. (7) Shortleaf heartwood or loblolly heartwood is as durable as longleaf heartwood, provided it has the same qualities as to specific gravity or density. (8) Specifications for durability of the three species of pine considered should be based on a judicious combination of the specific gravity, the number of rings per inch, and the percentage of sapwood. (9) The investigation showed that there are no toxic effects of resin but that it has other important relations to decay, including its waterproofing effect on the wood.

AERIAL MAIL FOR OUR MEN.—Aerial postal service between the American troops in France and their British and French comrades, with an extension to Algeria and Morocco, is planned by the municipal postal authorities at Lyons, France.

Second Prize in Reconsignment Privilege Contest

A Vivid Picture of the Actual Work Involved in Handling Reconsigned Cars Through a Busy Yard

THE first prize article in the reconsignment privilege contest was printed in last week's issue of the *Railway Age Gazette*. The following is the article that was awarded the second prize by the judges.

DIVERSIONS AND RECONSIGNMENTS—FROM A YARD STANDPOINT

By S. W. Wherry,

Assistant Yardmaster, Pennsylvania Railroad.

From experience in one of the largest railroad yards in the United States it is my opinion that the reconsignment privilege is being badly abused and is being used for speculative purposes instead of in a legitimate manner. One case which came to my notice during the coal shortage of last winter was where a broker had purchased between 75 and 100 cars of coal being loaded at various mines; then in order to get the cars away from the mines quickly, he had it consigned to tide water points. He then sold the coal at various points where coal was in great demand at a price considerable in advance of the tide water price and issued instructions to have it reconsigned. However, this form of speculation in coal has been done away with by putting into effect a tariff which prohibits the reconsignment of lading which is loaded in self-clearing cars.

There does not seem to be any question in regard to the diversion or reconsignment privilege being a desirable practice from an economic view, so far as it relates to the handling of perishable fruits, vegetables, etc., inasmuch as it permits of a better distribution of such products and prevents a glut of the market at one point while at another point the same product will be in demand. It is not practicable for every dealer handling these products to know what the other dealers have contracted for or what is being shipped to them on a commission basis, with the result that the market will be flooded with some commodity, resulting in not only a loss of money to the producer, but also a waste of a valuable food product, which could likely be used to advantage at some other city. In these cases the privilege of diverting or reconsigning the surplus cars should make it possible to make a more even distribution of the product, and while it no doubt enables the dealers to manipulate the supply so as to keep up the price, it also prevents loss to the producer and waste of the product.

Other than with perishable freight, the necessity for reconsignment or diversion, except in rare cases, would seem to cease to exist, and in the case of reconsignment of perishable freight the railroad company making the diversion or which has been requested to make a diversion, should be permitted to make a charge which will fully compensate them for the amount of work involved, as it means almost as much work to receive a request to divert a car as to actually accomplish the diversion.

In this yard we handle two kinds of diversions or reconsignments. First, those cars which are destined to some point beyond and which are to be reconsigned en route to some other point or are to be forwarded by some route other than the one via which they were originally billed. Second, those cars which are carded to this point with an "Order and Notify" consigne, for the express purpose of being reconsigned to some other destination after they reach here.

When a request is received to divert a car of the first description a message is issued from the office of the division superintendent giving the information in regard to the

original carding and the diversion to be made. When this message is received at the central yard office the clerk handling it must examine the car records to ascertain if the car has already passed this point, and if so, advise the forwarding record. If car has not passed, the instructions in regard to diverting it are telephoned to both the receiving and despatching offices of the yard. At these points the car number is placed on an indexed list and it is then the duty of the yard clerks to look for the car in every train received and every train despatched, until it is either located or advice is received that it has been caught at some other point.

If the car has arrived before the message is received and has been shifted to the classification yard, it is very probable that the diversion will be such as will place the car in another classification, and this means that before the car can be despatched it must be shifted out and placed in the proper classification. When it is considered that this shifting must be done on the tracks and switches over which all the trains made up for despatching in the direction in which car is moving must pass, it will be realized what it means to the yard operations at that point to have to cut out cars which have been diverted after having been classified and made up in trains ready for despatching. I know of nothing which will cause the assistant yard master at the despatching point to "lose his nerve" so completely as to have a train made up in the classification yard or placed on an "advance" track, all ready for the road crew and then to have the yard clerk inform him that he has just received instructions to divert one or more cars in the train so that they will go via another route and will have to be placed in another classification. This means that he will either have to put the yard crew back on the train and shift the cars out when the crew should be making up another train in order to keep the classification work going, or he will have to order the road crew to shift the cars out after it reports for the train, resulting in excessive terminal time and delay in clearing the advance track, which in all probability is needed for a train being made up by a yard crew, or in case the train is made up on a classification track it will mean delay to the classification crew waiting on room on that track.

After a car has been located and reconsigned it is necessary to make a telegraphic report through the office of the division superintendent and also to make a written report to the freight department.

It is hard to understand the necessity or the reason for the great number of orders which are being received daily to divert cars. During the last two weeks of August, 1917, instructions were received at this yard to divert 269 cars, an average of about 18 cars per day. These cars were loaded with almost every conceivable commodity, but it is interesting to note that there were proportionately few cars of perishable fruits or vegetables, there only being three cars of melons, one car of apples, one car of cantaloupes, five cars of bananas, five cars potatoes, six cars peaches, two cars fresh meat, and one car of tomatoes, while there were 20 cars of steel, 7 cars of cement, 33 cars of lumber, 29 cars of coke, 22 cars magnesite, five cars feed, nine cars of wire and one or two cars of almost everything else which is shipped by rail, so that it is evident that the principal use of the diversion privilege is not to secure a better distribution of perishable food stuffs. Our lists of numbers of cars to be diverted have contained as many as 76 numbers.

It is difficult to figure the cost of this class of diversion,

the principal item being the wages of the various clerks who handle the instructions and endeavor to locate the cars, this cost being governed by the length of time the instructions are held before the car is located; and it costs just as much to endeavor to locate a car which is caught at some other point as it does to locate one and make the desired diversion. We find that the average time for holding a re-consignment order before the car is located or the order cancelled is five days so that the approximate average cost of clerical labor in handling a diversion or reconsignment order for an eastbound car in this yard would be as follows:

Wages of clerk at central office, looking up record of car and relaying instructions to yard points; 10 minutes to each car.....	\$0.05
Wages of clerk at receiving yard examining manifests for all trains received in 5 days, at an average of 56 trains per day, 3 minutes to each train.....	2.45
Wages of clerk at despatching yard for same service for trains despatched.....	2.45
Total clerical cost.....	\$4.95

This cost does not include the stationery used or of the telephone or telegraph operators in transmitting the messages, and does not give any consideration to the cost of reshifting the car if it is located in the classification yard. This same expense evidently occurs at every yard to which the diversion order has been sent.

With the second class of reconsignment cars, which are those cars which are billed to this yard for the purpose of being reconsigned, an entirely different condition exists. These cars are loaded with flour, hay, wheat, corn, oats, other grains and grain products, and in the early spring with tomatoes from the south. With the cars of flour, grain, etc., I understand the lading is sold while the car is en route to this point or while it is being held here. When the lading is sold before the car arrives the reconsignment is also received before the car arrives and a new manifest is made out by the clerk who handles this work, so that when the car arrives in the receiving yard this clerk lifts the original manifest and places the new one with the car, so that it goes through the yard in the regular course of traffic and the only additional expense incurred is for the transmission of the messages and the clerical labor required.

When the reconsignment is not received before the arrival of the car, it is necessary to shift it to a track in the classification yard which has been set aside for this purpose, to be held until reconsignment orders are received. As reconsignment is being received for some of the cars on this track each day it is necessary to bring the cars back to the receiving yard and reclassify them once each 24 hours. This means that once each day during the time the car is held waiting on reconsignment it will be shifted from the receiving yard to the classification yard and returned to the receiving yard, this operation costing \$0.623 as follows:

Average cost of delivering cars to classification hump.....	\$0.032
Average cost of classifying a car over hump.....	0.286
Average cost of hauling a car from classification yard to receiving yard.....	0.245
Average cost of inspection of car each day.....	0.06

Now, when the yard is open and movement normal, the only question to this rehandling is the expense involved, but when the yards become congested and trains are being held out waiting on yard room we must consider that the time consumed in passing the reconsignment cars over the hump is lost and results in holding a train of active freight out of the yard just that much longer than if this time was used to shift a train which would pass directly through the yard, while the room made in the receiving yard by shifting the reconsignment cars is not available for receiving another train from the road, as it is usually the case that a train of reconsignment cars must be started from the classification yard to the receiving yard before there is room to classify the train which is in the receiving yard.

During the past several years the number of reconsignment cars handled at this point has fallen off to a considerable extent, possibly on account of the market conditions

and also on account of the higher demurrage charges. During the past year there were 5,070 of this class of cars handled through this yard, 3,180 of which were reconsigned upon arrival.

The cars which are held for reconsignment are in the yard from one day to several months, in fact some of the cars remain in the yard so long that they are almost considered as permanent fixtures. I have in mind the case of an Erie car which arrived on May 22 and was not reconsigned until June 25; this car was loaded with flour from Toledo, O. It was shifted over the classification hump and returned to the receiving yard a number of times at a total cost of approximately \$18.07, the charge for demurrage and reconsignment was, I believe, \$130.00, so that not counting any per diem charges for the foreign car, the net earnings were \$111.93 or \$3.29 per day. It would be interesting to compare these earnings with those of another car leaving Toledo at the same time but remaining in active service the 34 days this car was held.

The standard \$2 diversion charge will cover the cost of reconsignment where a car is billed to a certain point and reconsignment is at that point before the car arrives or within 24 hours after it arrives, but it does not cover the cost of holding a car for reconsignment more than 24 hours, or of picking a car out of general trade before it reaches its original destination.

WASHINGTON CORRESPONDENCE

WASHINGTON, November 13, 1917.

The western railroads will be heard on December 17 as to why they should be allowed to advance rates. The Commission connected the application with the old 15 per cent case and made it, like the application of the eastern railroads, a resumption of the case decided June 29 in advance of the Commission's being advised as to what the western railroads desire to say.

A clear definition of the wishes of the Official Classification railroads was made public by the Commission on November 8, when it gave out a copy of a petition signed on their behalf by George Stuart Patterson, George F. Brownell, Hugh L. Bond, J. L. Minnis and Clyde Brown of counsel. They set forth the desire of the eastern carriers to re-file all the percentage tariff supplements which the Commission suspended and ordered cancelled at the time it promulgated its Fifteen Per Cent decision at the end of June. They wish to file the supplements with the understanding that as soon as possible and in no event more than 90 days after they become effective, the carriers will file specific tariffs on the basis of advances of 15 per cent, preserving established rate groupings, relationships and differentials; that the order in the Anthracite case, docket No. 4914, be modified and the carriers be allowed to file tariffs increasing rates covered by that order, as requested in the petition filed at the hearing on May 9, 1917, on the Fifteen Per Cent case; that all applications filed since August 15, and not yet acted upon, and other applications now filed with the Commission but not cited by the Commission's order of October, 1917, be allowed and short time permission be given to file tariffs in accordance with the applications; that the commodity tariffs suspended and set down for hearing before Examiner Disque immediately after the hearing on November 5, be permitted to become effective, as published, on short notice. At the end of their petition the attorneys warn the Commission that "this outline of procedure is intended to complete the Fifteen Per Cent case and is not intended to relate to such further advances in class and commodity rates as may be proposed by the carriers."

Prior to the filing of that petition, Examiner Disque conducted the hearings assigned to him. Broadly speaking, Clifford Thorne and Graddy Cary, a new comer in practice

before the Commission, are the only opponents of the request. Their only clearly defined clients are the independent oil refiners. The traffic managers of these refiners, F. W. Boltz and W. E. MacEwen, testified the oil business is not on a war basis, gasoline selling now for only one cent per gallon more than when the price of crude was half what it is now. That declaration was made in answer to a query by Examiner Disque as to whether the independent industry could not live under the proposed increase in rates during the war. MacEwen said it could not stand even a 10 per cent advance without losing a large part of the market to the Standard and thereby reducing the production of the independent refiners.

COMPTROLLER WILLIAMS ON THE RAILWAY SITUATION

John Skelton Williams, comptroller of the currency, and Clifford Thorne, during the hearings on the resumed Fifteen Per Cent case, engaged in a controversy as to the duty of the Commission in view of the great shrinkage in railroad securities. Mr. Williams started it by giving out a statement expressing the belief that the Commission should and would allow an advance in rates, thereby increasing the credit of the carriers.

Before that he had advised the examiners of national banks to pay not a great deal of attention to the fact that there had been a big shrinkage in railroad securities. His object in doing that was to keep the banks from calling loans for which railroad securities had been deposited as collateral. The calling of such loans would cause, he argued, good securities to be needlessly sacrificed. He said that railroad securities had been leaders in the shrinkage.

That statement, appearing in the newspapers the day after the hearing at which the railroad executives testified, Thorne chose to regard as an attempt to exercise pressure on the Commission. In a letter, sent out to the newspapers and not received by Williams at the time it was released for publication, Thorne "challenged as untrue" the declarations of the comptroller that railroad "securities have sustained the heaviest shrinkages" and that "they have been the leaders in the downward movement of values." Thorne asserted that "the decline in security values is not due to inadequate railroad credit or inadequate railroad earnings; it is due to the war."

The part of the Williams statement that caused Thorne most anguish was the declaration that "if a way can not be found now to reduce the prices of materials and the cost of labor to a normal basis, and this for the present is hopeless, it seems clear on the facts before us that a revision and modification of the fabric of rates to meet these new conditions has become imperative."

Comptroller Williams was given an opportunity to answer Thorne at the same time the newspapers published the latter's letter. After explaining that his purpose was to prevent the sacrificing of good securities as a result of mistaken policy on the part of national banks carrying them as collateral, Mr. Williams said that it was only necessary to refer to the stock quotation list to see the "absurdity and error" of Mr. Thorne's claim that railroad securities as a class have declined at a less rate than government bonds. He compared the decline in government bonds, 2s, from 100½ to 97; 3s of 1918, from 102 to 99; 4s, from 112½ to 105, and 3s of 1961, from 103 to 85, with the following declines in railroad stocks during the past year: St. Paul, 102 to 37; B. & O., 96 to 50; New York Central, 114 to 65; Erie, 43 to 13; Pennsylvania, 120 to 94; New Haven, 77 to 21; Norfolk and Western, 147 to 100; Delaware and Hudson, 156 to 95, and Union Pacific, 153 to 108.

PRIORITY ORDERS REGARDING COAL SHIPMENTS

Judge Lovett, the government priority director, on November 10 issued orders releasing the Panhandle from the

obligation of sending coal originating at mines east of Steubenville, Ohio, to the ports for the lake cargo coal trade. The coal from mines on the rails of that carrier is more valuable for by-product coke ovens than for use in the heating stoves of the northwest. At the same time, Judge Lovett exempted all mines furnishing lake cargo coal from his first priority order for the 24 hours of November 19, so as to permit the operators to send their production to industries in Ohio. The supply of coal for the northwest has reached 26,000,000 tons and the lake cargo priority order will soon be rescinded in full because the demand for coal nearer the mines is as urgent as in the upper lake region. Twenty-six million tons was the supply upon which the northwest was able to live in the winter of 1916-17. It is now figured that if there is any shortage, it can be made up by all-rail shipments. Fred C. Baird, who has been in charge of lake cargo coal shipments, will probably be in charge all winter of the distribution of all-rail tonnage under the supervision of the Fuel Administrator.

HIGHWAY TRANSPORT COMMITTEE ORGANIZED

The Council of National Defense, acting through its advisory commission, on November 9 created a Highway Transport Committee to study the possibilities of motor truck transportation. It is composed of Roy D. Chapin, president of the Hudson Automobile Corporation, chairman; Logan Waller Page, the good roads expert of the department of agriculture; Henry G. Shirley, engineer for the Maryland State Roads Commission, and George H. Pride, president of the Heavy Haulage Company of New York.

The underlying idea seems to be that it may be possible to devise a scheme whereby the railroads may be relieved of the obligation to haul freight into the congested terminals by having deliveries made by motor trucks. Last winter, during the worst of the congestion, some shippers took delivery in the suburbs of Chicago, Cincinnati and other cities because they were more in need of the freight than they were of the money it cost them to have the lading of the cars hauled to the delivery points designated in the bills of lading. A considerable tonnage of package freight is also being handled by truck between New York and Philadelphia, and between other cities.

INDUSTRIES TO BE PUT ON FUEL ALLOWANCES

In a comparatively short time all industries probably will be placed upon fuel allowances. No industry will be wholly deprived of coal or coke. The full supplies needed for the war-essential industries will be procured through curtailment of the allowance for industries that are not essential to the prosecution of the war.

It is felt that no general rules can be applied without exception. It will be necessary, it is believed, for the fuel administrator to scrutinize the list of customers of each large coal dealer, find out what work each is doing, and then make his allotment in accordance with the relative importance of each establishment.

In an announcement by the fuel administration it is set forth that "the improvements in transportation which must be accomplished, together with the curtailment of shipments of coal to non-essential industries, to a limited extent, will provide sufficient coal for the railroads, munition plants, public utilities, and domestic requirements. The transportation problem can be relieved only by the reduction in the amount of freight the railroads shall be called upon to handle. The reduction of shipments of coal will accomplish this, in that it will remove from the rails the per cent of coal covered by such reduction, and will accomplish a proportionate reduction in the amount of products to be moved as a result of such curtailment.

"The government's war requirements have been provided.

and attention is now being given to the various steel plants and the plants manufacturing government munitions and other supplies. The requirements of public utilities are being arranged for on a permanent basis. Also the domestic requirements.

"Special arrangements have been made to provide coal for ship building plants, which will insure the operation of these plants on a 100 per cent basis, in so far as the supply of coal is concerned. The same applies also to the aeroplane program."

This rationing is to be accomplished by coal orders to the coal operators and coke producers issued by the fuel administrator, and priority orders to be issued to the railroads, wherever orders of the last mentioned kind are necessary. Priority orders are not necessary to persuade the carriers to perform their duties. They are necessary merely to protect them from suits for damages on account of the disregard of laws forbidding preferences and discriminations, during the continuance of the war. Thus far no carrier has failed to operate its property in accordance with plans for carrying on the war in the most efficient manner. Whatever trouble there has been has been made by shippers who have been unable to see why their business should be curtailed or destroyed so as to make room for more essential war operations.

PROPOSED INCREASES IN RATES IN NEW ENGLAND

The Interstate Commerce Commission has begun an investigation of its own, based on the applications of New England carriers for permission to increase passenger fares and advance class rates applying locally over one line or jointly over two. Commissioner Anderson is to hear testimony at Boston on November 21.

As to passenger fares, the Commission's announcement says, these applications propose an increase in the mileage book rates from $2\frac{3}{4}$ cents to $2\frac{1}{2}$ cents per mile and, an increase in one way fares from $2\frac{1}{2}$ cents to $2\frac{3}{4}$ cents per mile. It is also proposed to increase party fares from $2\frac{1}{4}$ to $2\frac{1}{2}$ cents per mile. This general statement applies to all the carriers except the Central Vermont, the Rutland and Grand Trunk. These three carriers propose only to increase the rate for 500 mile tickets from $2\frac{1}{4}$ to $2\frac{1}{2}$ cents per mile, no increases being proposed in the one-way fares. Certain changes are proposed by the Boston & Maine in its commutation fares and forms of commutation tickets.

The increases proposed in freight rates apply only to shipments moving under class rates either locally over one line or jointly over two or more lines. The proposed changes will result in materially increased charges for shipments moving under class rates, particularly for short hauls.

THE PRUSSIAN RAILWAY BUDGET.—The budget of the Prussian State railways for the financial year 1917-18 provides for very considerable expenditure. In addition to the appropriation of 105,000,000 marks (\$25,200,000) for locomotives and rolling stock and 151,000,000 marks (\$36,240,000) for new works and renewals, etc., over 312,500,000 marks (\$75,000,000) are to be spent under the provisions of the "Railway Loan Law." Of this sum, 259,000,000 marks (\$61,160,000) are to be allocated to locomotives and rolling stock and 15,250,000 marks (\$3,660,000) to new lines; 10,500,000 marks (\$2,520,000) are to be spent on track doubling, 5,000,000 marks (\$1,200,000) on light railways and just under 23,000,000 marks (\$5,520,000) on miscellaneous works. The budget also estimates an increase of 225,000,000 marks (\$54,000,000) in freight receipts and a decrease of 52,000,000 marks (\$12,480,000) in passenger traffic. These figures not to be taken at their face value, in view of the extent to which the German railway receipts are nominally increased by payments for military traffic, which merely represents sums handed over or credited by one government department to another.

MEETING OF RAILWAY DEVELOPMENT ASSOCIATION

The semi-annual meeting of the Railway Development Association took place at Chicago on November 8 and 9, with R. W. Cooke, president, in the chair. The convention was devoted largely to informal discussion by members on matters of interest to the organization. W. H. Manss, assistant to the vice-president of the Baltimore & Ohio, Baltimore, Md., outlined a plan he is preparing for the colonization of immigrants and returned soldiers and sailors after the termination of the war. His scheme includes the purchase of large tracts of land and the disposal of it on easy terms of payment. He favors the settlement of immigrants of the same nationality on adjoining plots and the erection of farm houses in villages centrally located with reference to the farms of the settlers, believing that this scheme will develop community spirit and a higher grade of agriculture. A similar plan of settlement is being worked out for veterans of the war.

J. C. Skinner, supervisor of state marketing agents, United States Bureau of Markets, Washington, D. C., urged members of the association to encourage the organization of co-operative shippers' marketing associations on the ground that these bodies insure the prosperity of the farmers and consequently the welfare of the communities which the railroads serve. He called attention to the federal law exempting such associations from prosecution under the Sherman anti-trust law and pointed to their advantages in increasing the agricultural yield, bettering the grade of farm products and improving methods of packing produce for shipment.

There was considerable discussion on the subject of whether there is a place for the railroad market bulletin now that state marketing agents issue such bulletins at regular intervals in many states. E. H. Anderson, agricultural agent of the New York Central, Rochester, N. Y., pointed out that government bulletins often reach the farmers too late to be of real service and that they contain information concerning large markets only. The railroad bulletins, he said, have the advantage of reaching the farmers more promptly and of containing information concerning the smaller as well as the larger markets. He explained how his road supplemented its bulletin service by sending the farmer advice concerning marketing conditions by telephone and telegraph. He also explained how his road had benefited the producer by diverting his shipments from glutted markets to points where his produce could be disposed of more advantageously.

The keynote of the discussion of railroad industrial development was that no further work should be undertaken except that which directly assisted in the winning of the war. The relative importance of agricultural work which shows immediate results and work the benefits of which extend over a long period were debated. It seemed to be the consensus of opinion, however, that agricultural agents should carry on neither kind of work exclusively. Various plans were suggested of compiling annual reports of agricultural accomplishments.

H. B. Fullerton, director of agricultural development of the Long Island, Medford, L. I., and chief grub scout of the Boy Scouts, described his work as director of fruit production by the Boy Scouts in Long Island. Mrs. H. B. Fullerton, assistant director of agricultural development of the Long Island, explained the advantages of a new dehydrator now used in this country. This process reduces the weight of fresh vegetables fourteen times.

A BAGHDAD RAILWAY RELIC.—Among the booty taken by the British at Baghdad was a sealed packet of tickets of the Baghdad railway. Each ticket had a round hole punched through the middle for the string (with a leaden seal) that ties the packets.

A Study of Friction Draft Gear Capacity*

A Travel of Four Inches or More is Recommended to Protect Properly the Car Structure and the Lading

By Louis E. Endsley

Professor, Railway Mechanical Engineering, University of Pittsburgh.

THERE are three things that draft gears may do in the handling of railway cars. These may be divided in general as follows:

1. Produce slack in starting trains.
2. Control slack in the movement of trains.
3. Reduce the impact force in the switching of cars.

In all of these the principle involved is the same, namely, producing the same speed in two cars that may be coming together or going apart because of differences of speed. The draft gear to be effective in doing this, must have a capacity that is relative to the difference in speed. What I mean by this is that for a difference of speed of, say, one mile per

will have to increase the slope of line AB to AD , in order to keep this pressure 300,000 lb. or below, and will only get an area represented by ADC , which is only twice that of ABC . The slope of line AD is much greater than line AB , and should it be desired to get four times as much area as that in ABC and still have the same travel, it will be necessary to increase the pressure to 600,000 lb., and then the area of AGC will be four times ABC , or area AGC will equal AEF , and the capacity of these two gears will be the same. The two-inch travel gear will have twice the final force that the one with the four-inch travel will have. This final force is what a great many people have called the capacity of a draft gear. The comparison shown in Fig. 1 is ideal. It would be almost impossible to construct a draft gear that has a slope equal to line AG . But this figure was merely given to illustrate the advantage of long travel gears.

If we have a draft gear that has a capacity equal to one-fourth the difference of the energy of two cars in impact, the cars will not receive a shock above the maximum force necessary to close the gear. That is, if a car is going 4 m.p.h. and strikes a car standing still, it will produce in the standing car approximately half of the speed of the moving car, or in other words, put into the standing car one-fourth of the energy that was originally in the rolling car. The rolling car will retain approximately one-fourth and coast down with the second car, but half the energy is gone and it must be absorbed in the draft gear or some part of the underframe. Of course, some of this energy may be absorbed, due to the shifting of the load, but it must be destroyed in some manner. If it is not done in the draft gear, it is bound to be done on the underframe or the coupler.

This shifting of the load amounts to considerable in some kinds of freight, such as coal and ore. Now, if the load should shift one inch, this would be equal to increasing the draft gear travel one inch; also, any give in the underframe would be equal to increasing the travel of the draft gear. Now there is considerable difference in the give of cars. Steel cars only give half as much as wooden cars below the elastic limit, assuming that both have the same ultimate strength. This fact is one thing that has been entering into wooden car construction. There has been considerable give in the bolt holes between the draft timbers and sills. Thus

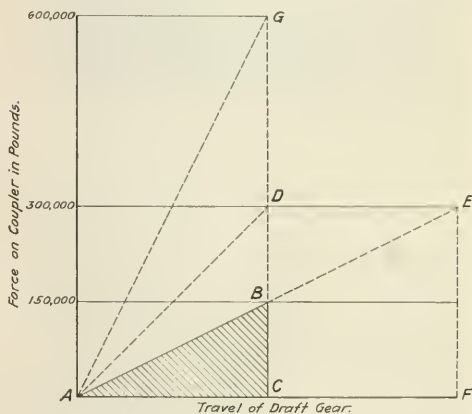


Fig. 1—Graphic Representation of Draft Gear Capacity

hour, a draft gear of small capacity will suffice, but if the difference in speed is 4 m.p.h., it will take a draft gear 16 times as large to prevent a shock, for the energy of a moving body is proportional to the square of its velocity.

Draft gear capacity is the number of foot-pounds of work required to just close the draft gear. It can be represented by an area, as shown in Fig. 1. The lower line of this chart represents the travel of the draft gear and the upper distance represents the force exerted on the coupler to close the draft gear. If we assume a draft gear with a travel of 2 in., or from A to C in this figure, a final pressure of 150,000 lb., or from C to B , and that the pressure necessary to close the gear under discussion was directly proportional to the movement; the line of action of the gear would be a straight line and would be represented by AB . The capacity of the gear then would be represented by area ABC . Now, if we wish to increase the capacity without increasing the slope of the line AB , we must increase the travel, and if we should increase the travel to double that shown in the shaded area, we would have four times as much capacity as we had before. That is, if AC equal half of AF , the area ABC is one-fourth of AEF . While if we wish to increase the capacity of the gear and not the travel, we

TABLE I
Comparison of a Car, Total Weight 150,000 Pounds

Speed in miles per hour	Approximate energy in foot-pounds	Capacity of gear in foot-pounds to just close	Approximate height of drop of 9,000 hammer to shear nine 19/32 rivets
1	5,000	1,250	4.7 in.
2	20,000	5,000	9.7 in.
3	45,000	11,250	18.0 in.
4	80,000	20,000	28.7 in.
5	125,000	31,250	44.7 in.
6	180,000	45,000	63.0 in.

the car itself has been absorbing the shock and there has not been as much need for a draft gear of a large capacity. But when we are now using all steel cars with no give in the rivets, the draft gear must do the work of absorbing the difference in energy between the two cars coming together in impact or the coupler or some other part of the car will have to do it; if the coupler is stronger than the other part of the underframe, the underframe will have to do it.

*Abstract of a paper read before the Canadian Railway Club, November 13, 1917.

In order to illustrate what energy is necessary to be absorbed for different speeds of cars in switching service Table I is given. The first column of this table gives the speed in miles per hour; the next column gives the foot-pounds of energy in the moving car at the speed given in the first column; the third column gives the capacity of the draft gear that should be used in each car for the speed represented in the first column for two cars weighing loaded, 150,000 lb.; the last column gives the height of drop that the 9,000 lb. hammer should fall before it shears off 9 19/32 in. rivets to have the capacity given in the third column. This column was obtained by multiplying the values in the third column by 12 and dividing by 9,000 and adding 3. The first part of this deduction is to obtain the height of drop to close the draft gear. The 3 added at the end is the added height in inches that it will take to shear the rivets after the capacity of the draft gear is taken up.

Now, it will be seen that a very small capacity is necessary for one mile per hour, namely, a drop of 4.7 in. of the hammer, but a draft gear that is many times as large is required for a difference in speed of 6 m.p.h., or 63.0 in. This height should be the total fall of the hammer to just touch the dummy coupler used, plus the travel of the draft gear. That is, if the fall of the hammer was 15 in. before it started to close the gear and the travel of the gear was 3 in., the total capacity of the gear would be represented by 18 in. I, personally, think that we should take care of 4 m.p.h. switching speed in the draft gear design. If we should do this, that is, if the draft gear would just close under a speed of 4 m.p.h., it is certain that the coupler or

average pressure that I obtained on several sets of lugs.

Now, when the 9,000 lb. hammer drops vertically on a draft gear that is supported on these two lugs that rest on a solid base with these same rivets in the lugs, they will not shear off until an approximate pressure of 275,000 lb. is reached, and in a good many tests with the same draft gear and different sets of lugs, the variation is never more than 1 in. That is, if a given gear shears off at a 16-in. drop, it might go 15 in. at another test, or if it shears off at 24 in. one time, it might go to 25 in. on another set of lugs. In other words, the variation is very small. I have con-

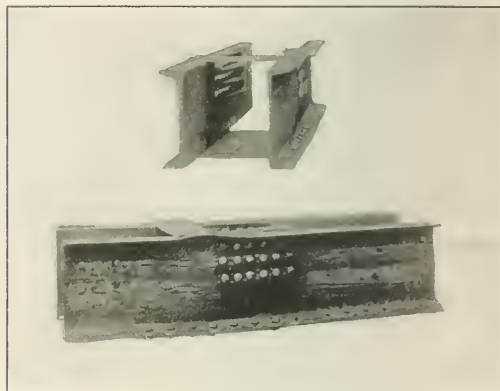


Fig. 3—Deformation of Sills with the Center Line of Draft $3\frac{3}{4}$ in. Down from the Top of the Sills

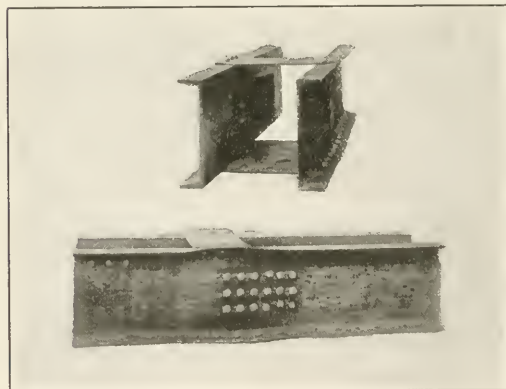


Fig. 2—Deformation of Sills with the Center Line of Draft at the Center

any part of the car would never be damaged in an impact between two cars at this speed.

There is not a coupler on the market but that will stand a greater impact force than the force necessary to close any draft gear on the market today. I have given some heights of drop that a 9,000 lb. hammer should fall before it shears off one or both lugs with 9 rivets 19/32 in. in diameter. This method of testing draft gears was first used, I think, in September, 1908, at the Westinghouse Airbrake Company, but there 9/16 in. rivets were used. To my mind, this is the best method of determining the capacity of a draft gear. In this method of testing, the draft gear is mounted on two lugs that are riveted to two short pieces of channels and held upright between posts. Each lug has nine rivets, each 19/32 in. in diameter, each lug carries half of the load, and the test is made by dropping the 9,000 lb. hammer from 1 in., 2 in., 3 in., and so on, until one lug is sheared off. This occurs at about 275,000 lb., which is the

ductured a test of a certain draft gear of a given make that sheared off three sets of lugs at exactly the same height, which means that this method is bound to give very accurate comparison of the capacity of different draft gears.

Up to this point in the paper, I have been talking of draft gear capacity and have not mentioned the absorbing capacity. I wish to distinguish between these two at this point. Draft gear capacity is defined as the foot-pounds of work necessary to close the gear. The absorbing capacity is that which is not given back when the draft gear is released after being closed. This feature of a draft gear can be very easily obtained from the drop of 9,000-lb. hammer by putting a recording pencil on the hammer and causing it to mark on a revolving drum. If the hammer falls 20 in. and rebounds, say 10 in., it is evident that the absorption has been half the capacity. This feature of the draft gear comes into play in controlling the slack of a long train in going up and down grades and in the starting and stopping of trains. If the slack should run in, and is not absorbed by the draft gear, it would run out under almost the same speed minus only that absorbed in the journal and rail.

This brings me to a point that I have often made, and that is, that we can not expect a draft gear to last the life of the car any more than we can expect a brake-shoe to last the life of the car. No one has, as yet, discovered a metal that has any absorption of work by sliding on some other material that does not wear. Of course, some metals wear more than others under the same absorption. Some years ago I made some tests for the Brake Shoe Committee of the Master Car Builders' Association, and found some shoes with the same coefficient of friction that varied as much as 300 per cent in the loss of weight in doing a given amount of work. And this is a very good subject for study by the draft gear companies. It was found that the loss of metal increases very fast as the pressure increased and the coefficient of friction decreases as the pressure increases. We should keep the pressure between the wearing surface of the

draft gear as low as possible and this can be done by making it as large as possible.

Some time ago the M. C. B. committee on car construction made some recommendations with regard to the center line of draft. These recommendations when applied to most cars fixed the center line of draft within 2 in. or 3 in. of the center of the sill. In order to get some information on this subject six sets of channels were made up; photographic reproductions of two of them after the tests are shown in Figs. 2 and 3. The channels were each 15 in. high and weighed 40 lb. per ft. The center line of draft of one set was placed on the center of the channel or $7\frac{1}{2}$ in. from the edge and this distance from the edge was decreased by $1\frac{1}{4}$ in. until $2\frac{1}{2}$ in. was obtained. Two sets of channels with the center line of draft $6\frac{1}{4}$ in. from the edge were made, one set of which did not have any tie plate. The results obtained are given in Table II. It is evident from this table that the

TABLE II

Maximum pressure obtained in impact test made on 15-in. 40-lb. channel with 15,000-lb. pendulum hammer, with different center line of draft.	
Distance from edge of channel	Maximum pressure obtained before the channel failed
$7\frac{1}{2}$ in.	1,125,000 lb.
$6\frac{1}{4}$ in.	960,000 lb.
5 in.	725,000 lb.
$3\frac{3}{4}$ in.	662,000 lb.
$2\frac{1}{2}$ in.	744,000 lb.
$6\frac{1}{4}$ in. without tie plate.....	

center line of draft should be for maximum strength within 2 in. of the center line of the sills, and that the tie plates are of great value in strengthening the sills. By looking at Fig. 2 it will be seen that when the line of draft is on the center, both upper and lower flanges are bending, while with the line of draft $3\frac{3}{4}$ in. from the edge, as shown in Fig. 3, nearly all of the bending is at a place in the edge of the channel closest to the line of draft. This is nothing extraordinary, for you all know that if you eccentrically load any two pieces of steel, the one close to the load is going to take most of the work and the ultimate strength of the system is reduced.

SUMMARY

I have attempted in this paper to bring to your minds two or three very important things in the selection of draft gears and the design of freight cars. One of the most important things is—we will have to increase the travel of the draft gear above that thought sufficient some years ago. Some years ago it was felt that 2 in. or $2\frac{1}{4}$ in. was as much travel as we should have. But I am ready today to say that we should have at least 4 in. of travel, or possibly more, in any draft gear. It is evident that this is going to allow us to materially increase the capacity of the draft gear.

Another thing of importance to the railway men today is to know what capacity of draft gear they are getting. I am confident that the best method for them to use is the rivet-shearing test, as already described. The number of rivets does not enter into the subject. What they should have is a set of lugs that will shear just above the force which is necessary to close the gear under test. I can conceive how a gear can be designed for a final pressure of 350,000 lb., then a test of rivets shearing off at 275,000 lb. would not be fair. But in any design of a lug, the lug should be made much stronger than the rivets in order that the lugs will not bend down and the gear show a false capacity. I can see how a lug may be built and give false capacity of draft gear, but the lugs should be designed stronger than the rivets. I myself, have not found a draft gear today but that will close before it shears off 9 19/32 in. rivets. There may be some, however, on the market.

One thing that is important in the design of a freight car is that the underframe of the car should be made stronger than the coupler. It has been the coupler in the past that has been saving the car after the draft gear went solid. The men who repair cars appreciate the large num-

ber of couplers that fail. I am wondering if when we put on the new M. C. B. coupler it is not going to be the underframe of the car instead of the coupler that is going to fail when the draft gear goes solid. Especially is this true if we move the center line of draft out from the center of the sills or leave off the tie plate, as shown in the latter part of this paper, because then the pressure of only 662,000 lb. destroys the sills with the center line of draft $2\frac{1}{2}$ in. from the edge of the channel. The new coupler will stand this and more in compression, which means that it will not be the coupler but the underframe that fails, and it will cost considerably more for repairs than the coupler.

I assume that everybody here knows that a friction draft gear is superior to a spring gear, but I do not believe that all of you know how much this difference is. The highest capacity spring gear in use, made of two M. C. B. class G springs, will fully protect your 100,000 lb. car and lading at a switching speed of a little less than 2 m.p.h. There are friction draft gears in general use on thousands of cars that will protect this same car and lading at 4.5 m.p.h. Also, there are many gears on the market that will fall between these two extremes, and each of these gears has a definite speed at which it will protect the car. But if you should attempt to switch cars at 4 m.p.h. while equipped with a spring draft gear that only protects the car at a little less than 2 m.p.h., the coupler, underframe and lading are bound to suffer. Either the coupler or underframe will fail if this speed of switching is kept up. On the other hand, should this same car be equipped with the highest capacity gear, mentioned above, it could be switched at 4 m.p.h. without any damage to the underframe or to the coupler.

Unless we put on a car a draft gear of sufficient capacity to keep it from going solid, the force that car will stand is going to be limited by the strength of the weakest part. If this is the coupler it will be from 400,000 to 700,000 lb. on most couplers in service, or if the car be equipped with the new M. C. B. coupler type D, this force will be from 600,000 to 1,000,000 lb. Now, if it be the underframe that is weakest, and this may occur if the design is not correct, this pressure will be a little less than that given above for the strength of the coupler. But in any case, this force may be 600,000 lb. Now, if the impact force and shock is 600,000 lb. and the weight of the car is 150,000 lb., the end pressure per pound of car weight and lading will be 4 lb. per pound of weight, or will be equivalent to standing a car on end that has four times as much load in it as the car in question contained. This is what has been knocking out the ends of cars, damaging roofs, side walls, and racking the car in general and on account of insufficient draft gear protection. Now, if the travel and capacity of the draft gear is enough to keep this end force down to 300,000 lb., it would result in practically no damage to the car.

More care must be given the draft gear in the manner of inspection and repairs in order that it may do the work which it was put on for, and which it will do if kept in repair. It may mean new gears or parts of gears, and there will be some expense attached to this inspection and upkeep, but the saving in repairs to other parts of the car is bound to more than make up for this expense.

DISCUSSION

Mr. Endsley's paper was received with enthusiasm by the members of the club who considered it a valuable contribution to the study of the draft gear problem. Among those who discussed the paper were James Coleman, superintendent car department of the Grand Trunk, C. W. Van Buren, general master car builder, Canadian Pacific, R. W. Burnett, master car builder, Delaware & Hudson, and G. E. Smart, master car builder, Canadian Government Railways.

All who spoke were strongly in favor of high capacity friction draft gears. Mr. Coleman said that about 70 per cent of the claims for damage to lading which are of an indeter-

minate nature may safely be charged to inefficient draft gears. Attention was called to the necessity for the inspection and maintenance of draft gears both by C. W. Van Buren and R. W. Burnett. Several members spoke particularly of the need of some method for automatically taking up the slack in friction gears as the parts become worn. Mr. Burnett called attention to the necessity for giving the draft gear attachments careful study, especially the draft yoke. These are often responsible for failures of the draft gear. G. E. Smart particularly urged the extensive use of metal draft arms on the wooden equipment which is now being built so extensively because of the lack of steel. In closing the discussion, Mr. Endsley called attention to the question of the relative strength of the draft gear and center sills, stating that the center sill construction should be made stronger than the draft gear and the draft gear so designed that the parts which are more accessible for repairs will fail first.

The meeting was addressed by E. W. Beatty, vice-president of the Canadian Pacific, who spoke of the Canadian Victory Loan. Eighty new members were taken into the club.

REPORT ON NEW JERSEY FULL CREW LAW

The New Jersey Board of Public Utility Commissioners has issued a report, signed by R. W. E. Donges, president, on the petition of the Central Railroad of New Jersey for authority to withdraw the sixth man from certain passenger and freight train crews; and the petition is denied.

The full crew law of New Jersey, chapter 190, of 1913, requires that on freight trains of more than 30 cars there shall be two brakemen besides the flagman. By chapter 94 of the present year this law is superseded by one empowering the commissioners, on their own initiative, or on complaint, to direct any railroad to employ such number of employees on any train as would be necessary to afford safe, adequate and proper service for the protection of the public and the employees; and this law forbids any reduction in crews from the number required by the law of 1913, without the consent of the commissioners.

The railroads of the state, through a committee, have worked for the repeal or modification of the full-crew law, and the present action of the Central of New Jersey was understood to be preliminary to action by other roads. On the Central the number of extra brakemen affected by the law is only 32.

At the opening hearing the railroad company modified its petition and asked for action only concerning through freight trains—long trains making few or no stops. In the petition 26 of these trains had been mentioned by name, but, says the report, "the road at the opening hearing announced that relief was sought not in relation to any particular train enumerated in the petition, but the board was asked for an order broad enough to authorize the road to reduce the number of men employed in operating all through, fast and drag freight trains."

Continuing, and referring to the brief of C. E. Miller, attorney for the road, the report says, quoting Mr. Miller: "Because of the variance in the number of trains of these classes operating each day, the petitioner will be precluded from obtaining relief in this or any other like proceeding, unless the order of the Board is broad enough to authorize it to reduce the number of men employed in operating all through * * * freight trains. The question therefore to be determined, resolves itself as follows: Will the operation of any of these trains by a crew of less than six men afford safe, adequate and proper service for the protection of the public and the employees? * * * And if so, on what train or trains should the railroad be authorized to reduce the crew?"

Hearings were held consuming many days. The report gives what purports to be a summary of the evidence; but this summary is taken up largely with a narrative of the

everyday work of the trainmen, with little specific reference to points in relation to which a third brakeman would increase or decrease the safety of operation. For a single day, September 12, records were kept of all the trains under discussion, showing the number of stops and the number of cars taken or left at each stop. On most of these trains the number of cars usually is from 50 to 75, the smaller number being on the fast freights. General Superintendent J. W. Meredith presented the principal statement for the road. The report copies from this a description of the road-work done by the crews; but this deals with routine matters and throws no light on the question of safety.

The Brotherhood of Railroad Trainmen, represented by J. A. Matthews, a New Jersey lawyer, opposed the petition, claiming that no proof had been submitted to justify the contention that the trains enumerated in it should be classified, and had not shown that the relief sought should be granted. A number of trainmen were called to testify concerning their duties and their everyday habits of work. Testimony was offered of a general character as to the number of stops made by these trains, the number of cars picked up and set off and the emergencies encountered.

These witnesses said that trains are longer and heavier than they were prior to 1913. They told of the number of regular and emergency stops and enumerated the causes of emergency stops. The report says that "all of the testimony shows conclusive variations on all the trains. * * * In the main the witnesses for the railroad and for the brakemen agree in their statements of the principal facts;" but as to inspection of cars at the beginning of a trip, the railroad says that inspectors are employed, while the trainmen claim that their own inspection is necessary because of the inefficiency of the regular inspectors.

Continuing, the report says:

"The petitioner insists that the crew of three men excluding the engineer and fireman would be ample, and that there is no work at the terminals which requires the extra or 'full crew man.' The respondent, on the contrary, insists that said man is necessary. The work necessary to be done by the crew on the road varies with the number of stops to be made, number of cars picked up and set off, the number of cars set off for disability. * * * The railroad company did not ask in its petition to remove the extra man from all through, fast, and drag trains operated by it. Only a few of such trains are therein included. We are unable to discover from the testimony what distinguishes the trains mentioned in the petition from the other trains in the classification of the railroad company. If it is sought to deal with the trains by classes, the proof should be satisfactory that the characteristics of such classes are substantially uniform, and applicable to all trains within the class. Further, the classification should be related to, and serve as a guide regarding the size of the crew required to handle such trains.

"We are unable, on the proofs submitted, to conclude that all through freights, all fast freights and all drag freights do not require a sixth man. To make the order sought by the company would result in permitting the company to exercise its judgment as to the size of crew of all through, fast and drag freights, and thereby wholly nullify the provisions of the statute.

"We are unable to deal with the particular trains specified in the company's petition, because it offered no testimony to show that these individual trains do not require the sixth man. It relies entirely upon establishing the classification above mentioned, which would include the trains specified, as well as other trains.

"We conclude, therefore, that the Board cannot, under the proof submitted, authorize the withdrawal of the sixth man from all 'through, fast and drag freights' as petitioned by the petitioner, and that the petitioner should continue to operate such trains with crews of the size now required by law. The petition for such withdrawals will be denied."

Bankers Report on Railroad Securities

Unsatisfactory Condition of Railroad Credit, and Conditions Which Must Be Restored to Re-Establish It

THE following is the report of the committee on railroad securities to the board of governors and members of the Investment Bankers' Association of America at the sixth Annual Convention of the association held at Baltimore, Md., November 12 to 15.

The committee believes that expansion of facilities is the most important problem which the railroads will have to face during the next few years, and that expansion sufficient to meet the demands of the business of the country will be impossible until the present unwillingness of investors to provide new capital can be overcome.

Opinions differ materially as to the causes for the present unsatisfactory situation. Individual cases of mismanagement and the depreciation which has taken place in market values, due to unfavorable financial conditions incident to the war, are frequently referred to as the primary causes for loss of confidence in railroad securities. While the committee believes that both of these factors have added to the difficulties of financing, it is strongly of the opinion that the loss of confidence is due largely to the decline of credit brought about by decreasing margins of net earnings over fixed charges and dividends. The conclusions of the committee are based upon an examination and an analysis of the financial statements of a large majority of the railroad systems of the country. These statements clearly show that the margins over fixed charges and reasonable dividends have been steadily and almost universally declining for some years, and this condition applies for the most part to the well managed and conservatively capitalized systems as well as to the systems whose managements have been fair subjects of criticism.

That confidence was not restored and the attitude of investors was not changed by the more favorable results shown by the railroad statements for the year 1916 may well be attributed to lack of assurance of the permanency of the improvement, due to the difficulties which railroads have experienced in the past in their efforts to obtain increased rates to offset increased costs of operation, and the apparent failure of the regulating authorities to recognize the amount of margin over fixed charges and dividends which is necessary to maintain credit on a satisfactory basis.

ROADS DIVIDED INTO GROUPS

For the purpose of this report the principal railroads of the country have been divided into three groups, and an attempt has been made to account for the varying degrees of credit possessed by each group.

Group one includes roads which are generally considered conservatively capitalized, with physical and other assets approximating the total capitalization, stocks and bonds: Further, with a capitalization so divided between stocks and securities with a fixed charge as to make the financial organization well balanced.

Group two includes roads in financial difficulties, and, for the most part, in the hands of receivers.

Group three includes roads of which a large majority has too large a proportion of the capitalization (even though the total may not be excessive) made up of securities with fixed charges, resulting in a poorly balanced and unsound financial organization.

A careful analysis shows that a very large proportion of the business of the country is handled by a comparatively small number of roads. For the year 1915, the total railroad earnings of the country amounted to \$3,125,135,798, of which \$2,893,037,528, or over 92 per cent of the whole, was handled by 87 systems, which included all the railroads with gross earnings of over \$5,000,000 per annum. The remaining business, \$232,098,270, was handled by 215 systems, the

earnings of each one of these systems being less than \$5,000,000 per annum. It will be seen from this that while the number of companies is large, the number which needs to be studied in order to learn the tendency of financial operations affecting the greater part of the railroad interests is comparatively limited.

Dealing, first of all, with the railroads in group one, it may fairly be stated that these roads represent sound practice both in operation and finance. For the most part they have met the tests of credit established by the conservative savings bank laws of New York and Massachusetts. Included in this group will be found all the railroad systems, with few exceptions, which have financed any considerable part of their requirements by stock issues during the past ten years—a practice which is generally recognized as an indication of sound and satisfactory credit. Accepting such a financial policy as a fair test of credit, it may well be said that the increased amount of financing through bond issues by roads which formerly financed to a large extent by stock issues, strongly indicates that credit, in recent years, has been on a less satisfactory basis. The real situation in this respect is clearly shown by an examination of financial data relating to the greater part of the roads above referred to, for it appears that during the first half of a period which included the years 1907 to 1914, approximately 60 per cent of the financial requirements were met by the issue and sale of stock, while during the latter half of the period only 17 per cent of the requirements were met by stock issues and 83 per cent by securities with fixed charges. Business handled by these roads represented more than a majority of the railroad business of the country and an examination of the financial statements of these companies for the years 1907 to 1910, the first half of the period under consideration, when improvements were financed more largely by stock than by bond issues, indicates the standard of credit which apparently met the requirements of investors.

The committee believes it is fair to assume from information available that the average capitalization of the railroads in group one represents an amount which is less, rather than in excess of the investment in the properties, and that rates for service which provided a reasonable return on their property investment would, therefore, provide a reasonable return on their entire outstanding capitalization, both stocks and bonds.

ROADS WITH GOOD CREDIT

Taken individually or collectively, in the first half of the period 1907 to 1914, when, as stated above, the major part of the financing of these roads was by means of stock issues, these roads, with few exceptions, earned their fixed charges more than twice over; their capitalization was divided about evenly between stocks and bonds; their dividends were earned approximately one and one-half times over. In order to pay fixed charges and a fair return on stock they were not required to disburse more than 80 per cent of their net earnings, thus permitting a shrinkage of 20 per cent of net earnings before reaching the point where it would be necessary to reduce the dividend rate. The remaining 20 per cent of net earnings, representing the margin over interest and dividends, served to assure investors of the ability of these roads to meet expected payments of interest and dividends and enabled them to make improvements to their properties without additions to capital accounts, which, for the most part, did not contribute directly to increased gross

revenues, but made the systems more efficient and more economical to operate.

Operating under these conditions, and pursuing this policy, these roads were able to sell substantial amounts of their stock at 100 or better, and in this way a proper relation between stocks and bonds was maintained.

Rates appear to have been sufficient to enable these roads, for the most part, to maintain an operating ratio, including taxes, of between 65 and 70 per cent of the gross receipts, leaving 30 to 35 per cent of each dollar of earnings available for distribution to security holders. This amount apparently gave investors in these conservatively capitalized systems satisfactory compensation for the use of their capital, and satisfied them that the payments could be relied upon and that the properties would be properly maintained.

While gross revenues of these roads were about 20 per cent greater in the second half of the period, capital expenditures had increased in substantially the same proportion, so that the relation of capital obligations, stocks and bonds, to gross earnings was approximately the same in both periods. The average rate of dividends paid by these systems was also substantially the same, showing a variation of less than one-half of one per cent. From this it follows that the proportionate part of gross earnings required to pay fixed charges and the same rate of dividends was relatively the same for both periods and necessarily required a like operating ratio to pay a similar return on invested capital and provide a like margin over these payments. During the years 1910 to 1914, the second half of the period, operating expenses and taxes, however, increased very generally to an amount equal to from 4 to 5 per cent of gross receipts compared with the years 1907 to 1910, and the increase undoubtedly would have been much greater except for many economies in operation, evidence of which is found in train load and other operating statistics.

It should be noted that an increase of from 4 to 5 per cent in the operating ratio results in reducing net operating revenue 12 to 15 per cent., and it appears, therefore, that nearly three-fourths of the surplus—that is, the 20 per cent margin over fixed charges and dividends—which served as a protection to the investments in the first half, had disappeared in the second half of the period, due entirely to increased operating expenses which the managements were unable to offset by additional economies.

In general, the committee believes that the margin over fixed charges and dividends which characterized the first half of the period must at least be maintained if credit is to be kept on a sound basis and railroad investments are to continue to be safe and attractive. It seems hardly necessary to suggest that when the proportion of property values and capitalization to gross revenues remains unchanged, requiring similar payments for fixed charges and dividends, this margin cannot be maintained on the same basis of rates when operating expenses are continually increasing. Nor can it be expected that the investors will retain their confidence in railroad investments and furnish additional capital with the margin over fixed charges and dividends rapidly disappearing because rates cannot be obtained to offset the increased costs of operation.

The committee believes it can be safely stated that the railroads comprising group one, which handle approximately 60 per cent of the business of the country, are reasonably capitalized, and that their capitalization is represented by a proper relation of stock to securities bearing a fixed charge. With the assurance of rates for service sufficiently liberal to provide a proper margin over fixed charges and reasonable dividends, investments in these roads would again command the confidence of investors, and under normal conditions little difficulty would be found in financing requirements by the issuance of either stocks or bonds.

ROADS WITH POOR CREDIT

The remaining roads of the country must meet similar tests of credit if they are to be successful in raising the capital necessary to expand their facilities to meet their business requirements. If a fair return on the outstanding capitalization of these roads is to be expected, their capitalization must necessarily approximate their property values, for rates for service as determined by the Interstate Commerce Commission and other regulating bodies are based on property values rather than on outstanding capitalization. It is important also to note that even though capitalization may approximate property value and rates provide a fair return on a capitalization equal to property value, unless such capitalization is properly divided between securities with fixed charges and stock, credit will not be on a satisfactory basis.

The problem of the remaining roads whose business constitutes approximately 40 per cent of the railroad business of the country is, therefore, not only to obtain rates which will offer a satisfactory compensation on an amount equal to their property values, but to make such adjustment of outstanding capitalization as may be necessary to bring about a close relationship between property value and capitalization, and a proper division of the resulting capitalization between fixed obligations and stock.

In considering the problem of these remaining roads, which, as stated, handled approximately 40 per cent of the business of the country, it is necessary to make some analysis of their present circumstances, and for a clearer understanding of the situation these companies have been subdivided into three classes, as follows:

Roads in actual financial difficulties* which carried about 17 per cent of the business of the country.

Roads not in actual difficulties but which have seldom, if ever in recent years, had sufficient credit to enable them to finance any substantial part of their requirements by the proceeds of stock issues, and have been obliged to resort to expensive and less satisfactory methods of financing. The business carried by these roads amounted to about 15 per cent of the business of the country.

Roads with less than \$5,000,000 each of annual gross earnings whose business constituted about 8 per cent of the business of the country.

Leaving out of consideration the last class, which, if analyzed, would divide itself among the other classes named, it will be found that there were certain definite causes which affected the roads in both the 17 per cent and the 15 per cent classes, and led to credit inferior to that of the railroad of the 60 per cent class.

The roads of the 17 per cent and 15 per cent classes, taken as a whole and considered apart from their capitalization, both as to amount and as to division between stock and obligations, were not in themselves substantially different from those of the 60 per cent class. The character of their business, as a whole, was much the same, for it consisted of about the same proportion of passenger and freight traffic. The freight business was divided in substantially the same manner among the different classes of commodities. The distance that the freight was hauled and passengers were carried, the size of the train loads and other details of operation did not vary materially from many of the best roads of the 60 per cent class, except such differences as might be accounted for by differences in the physical condition of the properties, due to depreciation.

Briefly stated, similar business was handled in a similar manner, and the amount of property necessary for trans-

*The classification which is adopted above is based on an analysis of the situation as it existed in 1915. Some of the roads referred to as in financial difficulties at that time have since been reorganized, but as the conclusions to be drawn would not be materially affected, the changes which have taken place since that time have been disregarded.

acting the business could not have been very different in the various classes. As the roads of all the classes are not divided by any geographical characteristics, it will be found also that the same general scale of rates applied to each class.

With the same general amounts of property values involved and a similar scale of rates, such differences as existed between the 60 per cent class, which had in the past met the tests of good credit, and the 17 per cent and 15 per cent classes, which had no credit at all or poor credit, must have arisen from causes other than the character of the property required to handle the business and the compensation for the service.

The similarity of the business and operating conditions which surround the railroads which until recently had met the tests of good credit—the 60 per cent class—and those comprising a large part of the remaining roads of the country—the 17 per cent and 15 per cent classes—are clearly indicated by the statistics contained in the table below. The figures in column I are made up from averages compiled from the statements of the following roads:

Pennsylvania	New York Central
Baltimore & Ohio	Chicago, Milwaukee & St. Paul
Chicago & North Western	Illinois Central
Louisville & Nashville	Pitts., Cin., Chi. & St. Louis
Atlantic Coast Line	Chi., St. Paul, Minn. & Omaha
Nashville, Chatt. & St. Louis	

The figures in column II are made up from averages compiled from the statements of practically all the larger systems described as groups two and three, and which are now referred to as the 17 per cent and 15 per cent classes.

Tonnage classification:	Column I	Column II
	The 60 per cent class	The 17 per cent and 15 per cent classes
Product of mines.....	43.0 per cent	40.7 per cent
Products of agriculture.....	15.2	15.0
Products of forests.....	13.0	14.8
Manufactures.....	18.0	16.4
Products of animals.....	3.2	3.4
Merchandise and miscellaneous.....	7.6	9.7
	100.0 per cent	100.0 per cent
Operating conditions:		
Proportion passenger revenue to freight.....	41 per cent	43 per cent
Tons revenue freight per train.....	406	394
Average haul per ton.....	174 miles	177 miles
Revenue per ton-mile.....	76c	79c
Freight revenue per train-mile.....	\$2.83	\$2.89

Of the two groups of roads designated as the 17 per cent class and the 15 per cent class, the former contains the roads of the country which are financially embarrassed. This class includes practically all the systems which have called forth serious criticism, and the committee believes it fair to state that while their troubles have undoubtedly been intensified by inadequate rates for service, the real causes which have resulted in their receiverships or their utter inability to finance by either stock or bonds have arisen from overcapitalization; from the results of unwise reorganizations; from past operating or financial mismanagement, or in some few cases, from unfavorable conditions peculiar to the roads themselves. These causes have been so deep-seated and of so long standing as to have put these roads beyond the possibility of relief from any source unless accompanied

Operating conditions:	Based on data compiled from roads included in the	
	60 per cent class	The 15 per cent class
Proportion passenger revenue to freight revenue.....	41 per cent	39 per cent
Rate per ton per mile.....	76c	76c
Freight revenue per train-mile.....	\$2.83	\$3.07
Tons of freight per train-mile.....	406	459
Average haul per ton.....	174 miles	178 miles
Operating costs in percentage of gross receipts:		
Cost of operation, including taxes, but excluding maintenance.....	45.1 per cent	45.5 per cent
Maintenance.....	29.8	28.5
Total operating, including taxes and maintenance.....	74.9	74.0

by substantial changes in their financial organizations. Accordingly, the problem of this class is a problem of the separate companies, which can be restored to credit only

through the remedies necessary in each particular case.

With regard to the difficulties of financing encountered by roads of unsound credit, designated as the 15 per cent class, the committee believes that unsound financial organizations are in part responsible, and these difficulties have been increased and intensified by inadequate rates for service.

The similarity of the business and operating conditions of these roads compared with the selected roads of the 60 per cent class will be apparent from an examination of the preceding table.

The differences in their financial organizations, which largely determine their credit, other things being equal, is indicated by the proportionate amount of fixed charges and dividends to the total amount distributed to security holders. The following table shows the amount of such distribution and the surplus remaining, based on \$1,000,000 net earnings in each case:

	Column I	Column II
Net operating income.....	\$1,000,000	\$1,000,000
Fixed charges.....	477,000	707,000
Dividends.....	367,000	134,000
Total distribution.....	\$844,000	\$841,000
Surplus.....	156,000	159,000

It will be noted that substantially the same proportionate amount of net operating income is distributed to security holders in each case, but in column I only 56.5 per cent of the total amount distributed as fixed charges and dividends was distributed as fixed charges and 43.5 per cent in the form of dividends, while in column II, 84.2 per cent was distributed as fixed charges and but 15.8 per cent as dividends.

If the foregoing is a correct analysis of the situation it is fair to assume, because of the apparent similarity of their business and operating conditions, evidenced by data contained in the several sets of tables, that the railroads referred to in both the 17 per cent and 15 per cent classes are entitled to at least the same rates for similar service which it is found necessary for roads in the 60 per cent class to receive to maintain their credit.

If the credit of the roads in financial difficulties—the 17 per cent class—is to be re-established on a satisfactory basis, in addition to receiving rates for service which would provide a fair return on the investment value of their properties, plans for their reorganization must be worked out which will recognize that capitalization must be adjusted to approximate property values and, further, that this capitalization must be divided between obligations and stock in accordance with standards observed by the majority of the roads which have successfully met the tests of sound credit in the past.

As regards the 15 per cent class, rates for service which yield a fair return on property values would increase net earnings so as to supply a more liberal margin over fixed charges, and thus tend toward a better basis of credit. In some cases ability to pay dividends might be restored and this might re-establish a sufficiently satisfactory relationship between the amounts paid as fixed charges and as dividends without any adjustment of the capitalization. In other cases some readjustment of the proportions of fixed obligations and stock would be necessary if the highest credit standing were to be obtained. This might be brought about by the issue of preferred stock for future financing or for refunding, or perhaps by the issue of stock without par value, or at a discount under proper regulations.

AN INSUFFICIENT MARGIN OF SAFETY

The committee believes that, on the basis of the operating costs which have prevailed in recent years, rates have been insufficient to provide adequate margins over the amounts required to pay a reasonable and fair return on capital legitimately invested in railroad properties. It further believes, unless operating costs can be materially reduced, that more liberal rates for the future will be necessary if railroad in-

vestments are to be properly protected and new capital is to be made available for future requirements.

In stating the necessity for more liberal compensation the committee believes that no policy of regulation can succeed which gives the companies merely enough for their existence, without an ample margin for contingencies and for the fostering of confidence in their financial soundness; and that no policy can succeed which is not elastic enough to adjust the income of the railroads to meet the ever changing and fluctuating costs of labor and of capital.

The principle that capital legitimately invested is entitled to full protection and a reasonable return has time and again been clearly recognized by courts and commissions. The difficulty appears to have been in the application of this principle, through the failure to establish any fixed policy as to what constitutes capital legitimately invested and failure to recognize, or difference of opinion, as to what constitutes a return sufficiently liberal to be fair and reasonable.

A large proportion of the business of the railroads is interstate business. Railroads operating within certain prescribed territories are obliged by economic laws and by the mandates of the Interstate Commerce Commission to handle similar business at similar rates. Some railroads must necessarily be more prosperous than others, because more advantageously located or because of the greater ability of their managers.

The committee believes that the public interest would not be served by basing rates upon conditions surrounding the roads which are least advantageously located or operated with the least efficiency, nor would it be any better served by bas-

roads which handle approximately 60 per cent of the business of the country. It would encourage roads in financial difficulties to reorganize so as to place their credit on a permanently sound basis. It would assist all the railroads of the 15 per cent class in the fulfillment of their duties toward the public and would very probably result in the early restoration of the best of these to a position of sound credit.

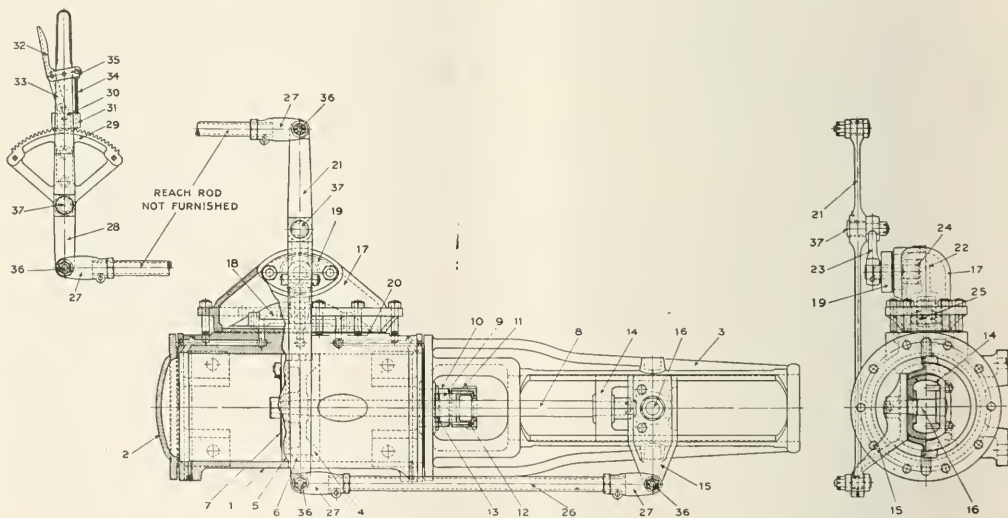
A liberal policy as to rates appears to be the most feasible and most necessary step toward the permanent betterment of railroad conditions.

Without expressing at this time any further opinion as to the methods of regulation, the committee wishes to express its approval of such changes in the present system as may be necessary to reconcile the conflict of authority which now exists between national and state commissions in matters which vitally affect the prosperity of railroads.

TYPE "B" RAGONNET REVERSE GEAR

What is known as the "Type B" Ragonnet power reverse gear has recently been brought out by the Economy Devices Corporation, New York.

The most noticeable modification from the standard Ragonnet gear is the method by which the combination lever is connected to the slide valve, which materially decreases the length of the cross-head arm and raises the lower end of the combination lever so that there is practically no projection below the reverse gear cylinder. A slide valve, modified in detail from that used in the older gear, has been retained and



General Arrangement of the Type "B" Ragonnet Power Reverse Gear

ing rates upon conditions which surround those most advantageously located and most efficiently operated. Lack of foresight and inefficiency should be penalized, as foresight and efficiency should be rewarded.

Broadly speaking, the public will best be served by rates for service sufficiently liberal to allow the railroads operated under average conditions and with reasonable efficiency to maintain their credit and pay satisfactory returns to their security holders.

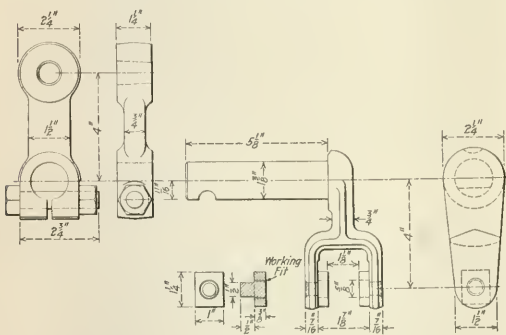
The committee believes that the adoption of such a policy toward railroad rates would make it possible within a reasonable time to place railroad credit generally on a satisfactory basis. It would automatically restore the credit of the rail-

the method of lapping the valve and maintaining air pressure in the cylinder is the same in principle as that previously employed. The mechanical connections, however, have been entirely changed and the gear possesses a number of operating features impossible of attainment with the older design.

Starting at the cab, it will be seen that the lower end of the reverse lever is connected to the top of the combination lever, while the crosshead arm and the lower end of the combination lever are joined by a connecting rod. The valve is operated by a rocker extending out through the valve chest gland 19, the end of the outside rocker arm being attached to an intermediate pin connection in the combination lever. For any position in which the reverse lever may be latched, it will be

seen that the valve is lapped when the piston has moved to a position in the cylinder corresponding to the position of the reverse lever. In this respect the operation of the "Type B" gear is the same as that of the previous type.

The construction of this gear is such, however, that the position of the reverse lever must always correspond within one or two notches to the position of the block in the link, irrespective of whether or not air pressure is available for the operation of the gear. This is brought about by extending the ends of the slide valve so that its movement in the valve chest is limited in either direction to the amount necessary to bring the cylinder port in line with the adjoining air admission port through the valve. A slight movement of the reverse lever causes the end of the valve to strike the end of the steam chest and prevents any further movement of the lever until the piston moves in the cylinder. The rocker arm connection 37 in effect becomes the fixed pivot, and the further movement of the reverse lever can only take place at a rate proportional to the movement of the piston in the cylinder. Should there be a tendency for the blocks to drop in the links when the engine is standing with the air pump shut off, excessive stresses might be set up in the parts of the gear if the valve and combination lever were depended upon to resist this movement. In order to protect the gear under such



Details of the Valve Rocker and Connections

conditions the reverse lever latch is so arranged that the force transmitted to the reverse lever lifts from the notches in the quadrant, thus permitting the lever to follow the movement of the link block to the corner. When the valve chest is again under pressure, no movement of the gear is possible beyond the slight amount necessary to lap the valve until the reverse lever is moved.

In the construction of the cylinder and valve, cored passages have been entirely avoided, thus eliminating any possibility of trouble from coarse sand or scale at the valve seat.

The increase in the length of the valve has materially added to the bearing surface and decreased the tendency toward uneven wear. Uniformity of wear is also insured by bringing the point of drive down close to the seat. The cylinder ports in the valve seat require an exhaust cavity in the valve but one-half inch in width and, therefore, the unbalanced area is so small that the valve always moves freely.

The parts inside the valve chest have been so arranged that there is nothing that can work loose or become displaced after they have once been assembled. The valve is moved by means of square blocks, which are placed on the inside of the jaws of the rocker, 22. These blocks work in vertical slots in the sides of the valve, and are pivoted about the ends of pins riveted in the rocker jaws. This construction will be made clear by reference to the drawing of the rocker. The rocker shaft is guided by the valve chest gland, 19, through

which it has a working fit. This gland is made steam tight by the use of a ball joint ring, 24, which seats against the end of the gland, the flat face bearing against a shoulder on the rocker. The joints are sealed by the pressure in the valve chest.

The piston is packed with a special type of packing which has been developed especially for that purpose. Each ring is made up of a special rubber core which will not vulcanize under the saturated steam temperatures met with in locomotive practice, and which is not affected by oil. Outside of this core the ring is made up of a duck fabric arranged in vertical layers, so that the edges of the material form the wearing surface. Three of these rings are placed in each piston and are held in place by a follower plate, the edge of which bears directly against the packing. The guides are of the bored type, and are cast integral with the front cylinder head, thus making them self-centering.

ACTIVITIES OF THE RAILROADS' WAR BOARD

Recently 1,500 flat cars have been rushed to lines operating in the Southeastern part of the country, in order to facilitate the transportation of the piling and heavy lumber needed for the new shipbuilding yards.

The Commission on Car Service has also ordered the prompt movement of more than 3,000 box cars into the West and Middle-west, to protect government orders of grain and hay.

In addition, large consignments of refrigerator cars have been sent into Colorado, Idaho, North Dakota and Minnesota, to handle the apple and potato crops. The potato growers of Colorado increased their production this year without making any provision for the storage of the extra crop. As a result the demand for refrigerator cars has been unusually heavy.

To safeguard the movement of all perishable crops the Commission on Car Service has issued a general order to the railroads, instructing them to exercise the strictest economy in the handling of refrigerator cars, the supply of which is unusually unequal to the demand. The order states that cars shall not only be moved with despatch and unloaded promptly but that all refrigerator cars must be returned at once to the owning road after they have been unloaded. It also urges more co-operation on the part of the shippers to load cars to full capacity, instead of wasting car efficiency through continued shipment of minimum carloads.

The Commission on Car Service has supplemented this order with the suggestion that the railroads save refrigerator cars by making a more liberal use of box cars in moving potatoes. These box cars, the commission states, will be suitable for the movement of potatoes if they are substantially lined and provided with stove protection.

On 77 of the principal railroads of the United States a saving of 114,109 cars was effected in one month this year, solely by increasing the average loading of less-than-carload freight, according to a statement by the Railroads' War Board.

The reports on which these figures are based cover the months of July of this year and July, 1916. They show that the average loading for that class of freight during July of this year was 13,927 lb., as compared with an average of 11,619 lb. during the same month of last year.

The 77 railroads from which reports have been received were able to move the total volume of less-than-carload freight last July in 579,180 cars. Had the average loading per car been at the same rate as during the month of July, 1916, they would have been compelled to use 693,289 cars.

TRAINMEN WANT MORE PAY

The brotherhoods of conductors and of brakemen are taking a vote, said to cover the whole United States, on the question of asking their employers for an increase of pay; and it is understood that the vote is expected to be canvassed by November 25 so that the demands can be submitted to the railroads on December 1 with the proposal that the increases take effect on January 1.

These two brotherhoods are said to include 32,000 passenger trainmen, 85,000 freight trainmen and 53,000 yardmen. The increases called for range from 20.6 per cent for passenger conductors, 28.9 per cent for freight conductors and 43 per cent for freight brakemen up to 51.5 per cent for passenger-train baggage-men.

The demands of the conductors and brakemen, if granted, would add to the payrolls of the eastern roads—not the roads of the whole country—about \$48,000,000. This sum is some \$17,000,000 or more greater than the advances which have already been granted under the so-called eight-hour law, and which went into effect on January 1, 1917. The conductors and trainmen receive about 55 per cent of the total expenditures for wages in the train service; that is to say, the enginemen and firemen receive 45 per cent. Therefore, if the men on the engine should ask to be favored in the same way that the men behind the tender are favored, and if both requests were to be granted, there would be a total increase in expenses on the eastern roads of \$87,000,000.

According to a report in a New York paper the brotherhood leaders were opposed to demanding an increase of pay at the present time, but found it necessary to give way to the more radical men among the subordinate leaders. Warren S. Stone, chief of the Brotherhood of Locomotive Engineers, is credited with having refused to consent to a demand by that brotherhood at the present time.

The foregoing appeared in the newspapers of Wednesday morning, November 14. On Wednesday afternoon a despatch from Washington said that W. L. Chambers, government conciliator, had already had conferences with railroad officers and brotherhood leaders looking to an amicable agreement to defer till after the war any disputes about wages, and that President Wilson, co-operating with Mr. Chambers, had arranged to meet the chiefs of the four principal railroad brotherhoods in conference at Washington on November 22.

The President's attitude on the subject of the threatened strike is revealed in the following letter to Judge Chambers:

"My Dear Judge Chambers: May I not express my very deep and serious interest in your efforts to bring the railroad executives and the brotherhoods engaged in train operation to an agreement that there shall be no interruption in their relations on either side until ample opportunity shall have been afforded the United States Board of Mediation and Conciliation to bring about if possible an amicable agreement, and that in the event of a failure to bring about such an agreement any controversy that may have arisen will be submitted to arbitration, in accordance with the provisions of the Newlands law?

"I take it for granted that your efforts will succeed, because it is inconceivable to me that patriotic men should now for a moment contemplate the interruption of the transportation which is so absolutely necessary to the safety of the nation and to its success in arms, as well as to its whole industrial life; but I wanted, nevertheless, to express my deep personal interest in the matter and to wish you god-speed.

"The last thing I should wish to contemplate would be the possibility of being obliged to take any unusual measures to operate the railways, and I have so much confidence that the men you are dealing with will appreciate the patri-

otic motives underlying your efforts that I shall look forward with assurance to your success.

"Cordially and sincerely yours,
"WOODROW WILSON."

ANTHRACITE SHIPMENTS IN OCTOBER ESTABLISHED A NEW RECORD

The shipments of anthracite for the month of October, 1917, as reported to the Anthracite Bureau of Information at Wilkes-Barre, Pa., amounted to 7,110,950 tons, establishing a new record for monthly shipments, and exceeding the shipments of June, 1917, which until now had been the greatest of any month in the history of the industry, by 61,913 tons.

The October shipments show an increase of 738,194 tons, or 11 per cent, over the preceding month, and are 1,240,746 tons, or 21 per cent, in excess of the shipments during the corresponding month last year.

The total shipments for the first ten months of 1917 have amounted to 64,889,047 tons, an increase over the same period in 1916 of 9,088,427 tons.

Distributed by carrier companies the shipments during October were as follows:

	October, 1917	October, 1916	Year, 1917	Year, 1916
P. & R. R. W.	1,435,265	1,206,570	12,479,062	10,601,274
L. V. R. R.	1,314,896	1,073,176	11,816,247	10,009,618
C. R. of N. J.	756,659	611,158	7,006,748	5,913,706
D. L. & W. R. R.	1,153,661	946,945	10,432,010	8,705,328
D. & H. Co.	813,429	589,636	7,163,101	5,875,184
Penna. R. R.	400,662	480,920	4,705,137	4,953,554
Eric. R. R.	793,226	623,383	7,462,190	6,409,638
N. Y. O. & W. R. W.	179,403	132,291	1,691,295	1,635,766
L. & N. E. R. R.	396,113	279,252	3,298,861	2,098,486
	7,263,314	5,943,331	66,054,651	56,202,554
*Deduction	152,364	73,127	1,165,604	401,934
	7,110,950	5,870,204	64,889,047	55,800,620

EQUIPMENT EXPORTS DURING SEPTEMBER.—The total exports from the port of New York during September, 1917, amounted to \$240,843,788, according to the foreign trade records of the National City Bank of New York. The value of steam locomotives exported in that month was \$3,170,273, railway cars \$1,719,818, and rails, \$1,045,400.

BRITISH CANALS RELIEVING FREIGHT CONGESTION.—Every effort is being made by the Canal Control Committee of England to divert coal and other heavy traffic to the canals so as to relieve the congestion on the railways. In the Midland district, in the case of one canal system alone, the amount of coal being transferred to the canal from the railways was equivalent to 150,000 tons per annum.

PROPOSED RAILWAY FOR COSTA RICA.—Philip W. Chamberlain, San Jose, Costa Rica, a member of the American Society of Civil Engineers, has a project for the construction of a railway from Alajuela to Grecia, Costa Rica, a distance of 25 kilometers (about 16 miles). There is one hitch in the concession, so far as the contract is concerned, with the Minister of Public Works. The proposition of Mr. Chamberlain is to put down a 30-inch gage track, making foundation on that basis, with an agreement to change to a 42-inch gage after 20 years. The government desires the foundation to be made at once for a 42-inch gage, although conceding the use of the narrow gage for 20 years. The concession is to be for 99 years. The government agrees to advance bonds for \$3,000 American gold per mile, or a total of \$75,000, secured by direct tax on the region benefited. The contract is subject to the approval of Congress, which does not meet again in regular session until May, 1918. The railroad will require equipment not now at hand as follows: Three 12-ton locomotives, twenty-five 8-ton freight cars, enough 20-pound rails for 15 kilometers (9 miles), telegraph and telephone equipment, and other necessary equipment.—*Commerce Report*.

General News Department

At the meeting of the Louisiana Engineering Society at New Orleans, La., on November 12, R. E. Hartman read a paper, entitled "Yellow Pine Industry in the South."

The Nashville, Chattanooga & St. Louis reports that 933 officers and employees of the road subscribed to the second Liberty Loan to the amount of \$93,400; this in addition to the million subscribed for by the company.

The Southern Railway now furnishes "coach lunch service" on trains which have dining cars. The dining cars have been provided with basket trays and the waiters pass through the coaches to sell sandwiches and coffee.

The Chicago & Alton has created the position of examiner in rules. Maynard M. Meatyard, a locomotive engineer, has been appointed to the new position. He will examine and instruct all train and enginemen in the operating rules and all enginemen in the rules for machinery.

A general increase in the pay of shopmen on the Pennsylvania Railroad east of Pittsburgh and Erie was announced this week, affecting, it is said, about 10,000 persons. Some clerks are also affected. The Lehigh Valley has advanced the pay of considerable numbers of station agents by from \$7 to \$10 a month.

According to report, Prof. E. C. Schmidt, head of the department of railway mechanical engineering at the University of Illinois and a recognized authority on train resistance, has received a commission as major in the ordnance department of the Officers' Reserve Corps and hereafter will have headquarters at Washington, D. C.

Three 300-foot spans of the Union Pacific bridge at St. Joseph, Mo., were moved 140 feet west at 11.30 on Wednesday morning to make room for a new draw span; this was completed in 13 minutes without accident. Traffic was interrupted for several hours on account of preliminary work and the restoration of track; new piers have been built to receive the spans.

The Mexican Railway, Mexico City to Vera Cruz, and the Tehuantepec National, extending across the Isthmus of Tehuantepec, are now under the same management, and Paulino Fontes, acting general manager of the Mexican, has been placed in charge of the entire system. This change took effect on November 10. R. Maury, general manager of the Tehuantepec National, has been transferred to another department. Traffic on both of these roads is said to be increasing.

Lord Shaughnessy, president of the Canadian Pacific, has subscribed on behalf of that company to the new Victory Loan of the Canadian Government the sum of \$5,000,000; and he says that if the amount called for should be increased from the present figure 150 millions to three hundred millions, the Canadian Pacific would subscribe ten millions. The Canadian Pacific already has lent to the British and Canadian Governments in connection with the war, cash and securities to the amount of nearly seventy millions.

At a banquet held by the Chicago chapter of the American Association of Engineers on November 10, Capt. Robert W. Hunt, president of R. W. Hunt & Co., Chicago, made a talk, entitled "Our War," in which he emphasized that this is an engineers' war. Others who spoke were Capt. Howard Scott, who served 28 months on the front and in the trenches in France, and Dr. F. H. Newell, of the University of Illinois. W. H. Finley, chief engineer of the Chicago & Northwestern and first vice-president of the association, presented a sabre to Garrison Babcock, formerly president of the association and now captain in the United States signal corps.

The Chicago & North Western and the Chicago, Burlington & Quincy have elected to operate under the provisions of the Wisconsin workmen's compensation act, and have filed certificates. This means that the law will apply to shop men, section hands and all other employees of these roads except those engaged in

interstate commerce, whose rights to recovery when injured are governed by the federal employers' liability law. Heretofore only the Minneapolis, St. Paul & Sault Ste. Marie and the Great Northern have been subject to the Wisconsin workmen's compensation act.

A. H. Plant, chairman of the Accounting Officers' Committee, announces that the internal revenue commissioner holds that the 8 per cent tax on passengers applies on the amount paid for extra baggage, dogs, etc. The tax will be due if the total amount paid by a passenger, including transportation and excess baggage, is more than 35 cents. A tax of at least one cent must be collected on each consignment of freight; for example, on a freight bill of 15 cents the figure would be less than 5 mills, but the tax will be 1 cent.

George H. Ingalls, traffic manager of the New York Central lines west of Buffalo suggests that the custom of sending Christmas cards by railroad officers be abolished this year and that the money ordinarily expended for that purpose be given to the Red Cross or some other war fund. Mr. Ingalls says that every Christmas railroad men send in the aggregate thousands of holiday greetings to their fellow officers, to shippers and others. The printing, postage and distribution of these cards involves large expenditures and the cards clog the mails at a time when the postal department needs space for more important matter.

Henry B. Endicott, manager of the Massachusetts Public Safety Committee, acting as arbitrator in the recent differences between the Boston & Maine Railroad and its shop and other employees, decides that the employees are not entitled to the additional three cents an hour in their pay which they asked for. Their threat to strike for an increase of 8 cents an hour was temporarily settled by the road paying an advance of five cents an hour and leaving the difference, three cents, to arbitration; and the result is now announced. The arbitrator says that he is absolutely clear in the view that the five cents advance has set the men on at least as high a basis as the average in the Eastern half of the country.

Railways Co-operate With U. S. Food Administration

Out of 66 railway dining car services in the country 47 have pledged themselves to work with the Food Administration in having meatless and wheatless days and urging the general plan of food saving on the public.

Philadelphia Bourse Urges Strike Prevention Legislation

Strike prevention legislation, affecting the operating employees of railroads, is urged by the Philadelphia Bourse in a statement recently made public, a part of which follows:

"Threatened demands by railroad employees for further increased wages and indications of trouble at a time when the safety of the nation requires the smoothest possible operation of the railroads, over-burdened as they are with war-traffic, will probably lead to renewed efforts by representative organizations of business men and shippers throughout the country to have Congress, when it convenes in December, put through legislation recognizing the railroad operatives as public servants, and as such not free to combine to leave employment simultaneously, and recognizing the interest of the public, as a third party, in disputes between the railroads, as public service corporations, and their employees.

"The men who are employed to operate these arteries of our national body are public servants, and have automatically assumed a public duty which cannot be lightly disregarded. This public duty is paramount to any personal claims. It was so before the war, and now the necessity is doubly increased. . . . There is no issue that can be raised between the roads and their employees that is not arbitrable, and Congress can make strike prevention legislation fair to the trainmen by requiring arbitration that is just and equitable."

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF AUGUST, 1917

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses			General.	Total.	Net from operation.	Railway accruals.	Operating (or loss), last year.	Increase (or decrease), this year.
		Freight.	Passenger.	(Inc. misc.)	Maintenance of way and structures.	Equip- ment.	Traffic.							Trans- portation.
EIGHT MONTHS CALENDAR YEAR, 1917													
Atlantic City.....	170	\$89,783	\$39,379	\$12,592	\$29,079	\$12,592	\$9,686	\$860	\$60,336	\$830	\$79,057	\$11,000	\$268,057
Philadelphia & Reading.....	1,127	4,352,753	733,386	6,082,426	2,113,33	11,085,4	18,132	85,919	4,083,103	31,474	1,979,179	178,251	1,800,792
Port Reading.....	21	147,753	.....	.....	21,133	11,085,4	4,40	83,956	116,337	62,38	70,132	10,500	59,632
MONTH OF SEPTEMBER, 1917													
Alabama & Vicksburg.....	143	\$129,388	\$48,107	\$189,025	\$24,815	\$30,703	\$5,596	\$6,831	\$128,497	67,75	\$61,178	\$20,705	\$40,534
Albama Great Southern.....	312	405,241	177,713	619,087	55,948	123,651	16,235	19,804	404,513	65,34	214,576	37,368	63,556
Archison, Topeka & Santa Fe.....	8,640	1,181,224	114,243	1,295,467	2,068,955	3,760	183,135	39,838	7,718,559	123,78	34,318	15,039	24,674
Atlantic Coast Line.....	4,724	2,213,337	957,556	3,409,914	44,531	57,470,9	5,871	1,261,407	2,430,486	71,28	979,427	756,594	30,308
Baltimore & Ohio Chicago Terminal.....	79	22,842	506	171,040	22,842	39,646	1,074	101,732	172,38	101,05	-1,787	20,147	30,308
Baltimore, Chesapeake & Atlantic.....	82	92,401	52,033	154,809	6,862	4,657	2,060	68,804	123,746	79,93	31,063	106,31	18,052
Bangor & Aroostook.....	632	1,237,200	44,037	1,321,417	18,947	230,695	16,115	377,171	819,66	62,03	401,457	29,204	638,139
Birmingham Southern.....	244	69,594	2,063	93,316	15,724	2,242	8,02	49,206	92,857	96,22	729	-4,304	13,907
Boston & Maine.....	2,305	2,760,452	1,926,268	5,239,744	597,063	633,820	33,773	2,433,682	112,349	38,374	73,19	1,405,019	123,734
Buffalo & Susquehanna R. R. Corp.....	253	1,139,563	5,932	1,446,496	24,440	45,744	1,484	45,614	1,203,66	24,863	6,000	23,882	47,422
Buffalo, Rochester & Pittsburgh.....	532	1,187,273	1,371,363	2,558,636	208,168	319,966	37,910	936,478	41,086	327,774	66,980	327,774	47,422
Central of Georgia.....	1,919	817,966	380,890	1,332,620	261,634	301,284	34,420	1,393,766	64,108	1,030,194	191,752	827,335	189,278
Central of New Jersey.....	634	2,336,718	694,228	3,029,166	84,917	121,486	40,290	3,067,980	35,914	1,322,346	71,95	451,455	161,767
Central New England.....	391	421,600	46,887	82,917	42,816	1,668	176,884	12,083	319,007	68,04	149,870	19,000	130,485
Central Vermont.....	442	171,810	105,194	415,520	48,834	69,130	9,187	191,874	9,652	331,408	85,112	15,865	99,475
Charleston & Western Carolina.....	342	146,230	40,721	203,261	30,155	27,020	5,093	154,641	9,654	69,20	1,554,559	200,000	116,654
Chesapeake & Ohio Lines.....	2,070	1,792,246	541,364	1,837,796	211,428	400,882	40,290	637,980	35,914	1,322,346	71,95	451,455	161,767
Chicago & Alton.....	1,053	1,179,246	541,364	1,837,796	211,428	400,882	40,290	637,980	35,914	1,322,346	71,95	451,455	161,767
Chicago & Eastern Illinois.....	1,131	1,384,935	328,134	1,840,691	165,049	452,219	24,745	675,051	43,366	1,365,640	73,83	484,051	203,743
Chicago & Erie.....	269	574,588	52,588	669,347	81,694	93,420	22,573	356,255	18,008	578,316	86,40	31,275	49,755
Chicago & Northwestern.....	8,108	6,501,473	2,415,498	10,662,306	1,251,707	1,562,771	122,069	3,742,022	185,451	6,443,33	63,541	48,025	51,668
Chicago, Detroit & Can. Grd. Trk. Intn.....	1,496	92,071	412,679	1,419,958	248,146	251,138	47,147	508,451	37,783	1,105,306	77,87	314,092	71,338
Chicago Great Western.....	13	6,005,626	2,622,295	8,627,921	478,784	251,138	14,371	131,625	39,159	229,136	85,40	31,892	-32,069
Chicago, Milwaukee & St. Paul.....	10,256	1,587,627	29,477	1,617,104	10,210	24,000	4,870	8,369	18,587	597,920	1,597,014	-1,535,974	1,597,014
Chicago, Peoria & St. Louis.....	235	1,056,290	266,244	1,322,534	121,503	141,440	5,970	86,389	5,970	1,322,534	1,597,014	-1,535,974	1,597,014
Chicago, Rock Island & Gulf.....	479	209,277	83,989	317,161	19,161	41,450	9,770	86,389	1,613,961	1,597,014	-1,535,974	1,597,014	-1,535,974
Chicago, Rock Island & Pacific.....	7,822	4,589,729	2,066,755	7,469,576	931,127	1,350,100	139,246	2,649,403	177,074	5,267,053	70,51	2,023,823	328,127
Chicago, St. Paul, Minn. & Omaha.....	1,452	2,313,312	627,277	2,940,591	266,669	258,336	28,227	852,212	45,858	1,456,785	137,282	434,182	367,337
Chicago, Terre Haute & Southeastern.....	1,752	1,444,527	300,165	1,744,692	138,133	82,643	25,432	365,414	29,838	1,456,785	137,282	434,182	367,337
Cincinnati, New Orleans & Texas Pacific.....	337	779,257	309,093	1,136,137	82,643	25,432	25,432	365,414	29,838	1,456,785	137,282	434,182	367,337
Cincinnati Northern.....	245	214,194	181,800	339,334	32,307	34,111	3,291	78,989	2,966	339,334	32,307	34,111	3,291
Cincinnati, Northern, Chic. & St. Louis.....	2,386	3,167,475	1,189,064	4,762,035	362,746	87,863	1,843,355	84,808	3,299,983	1,463,052	323,000	1,139,849	-185,713
Coal & Coke.....	197	82,439	24,461	112,538	25,044	28,573	828	42,057	97,032	86,21	15,526	6,000	1,936,28
Colorado Midland.....	338	165,137	20,231	194,859	44,085	23,646	7,009	86,98	3,593	166,368	85,39	21,680	6,781
Cumberland Valley.....	163	349,542	67,610	435,992	27,104	42,740	1,373	34,968	1,278,464	52,50	29,461	2,162	6,617
Delaware & Hudson Co.—R. R. Dept.....	269	2,274,326	317,120	2,738,027	223,133	500,148	27,016	1,137,312	180,949	832,336	673,37	2,162	6,617
Duluth & Iron Range.....	414	1,028,756	179,661	1,208,756	108,567	191,443	1,554	237,908	19,747	550,502	397,969	-59,204	397,969
Duluth, Mississ. & Northern.....	34,272	2,377,746	34,272	2,412,018	146,317	102,163	3,153	442,130	69,977	768,015	32,30	1,109,136	500,594
Elgin, Joliet & Eastern.....	905	1,213,117	126,641	1,406,338	129,518	168,880	5,435	186,795	11,706	455,976	31,216	374,760	51,088
Elgin, Joliet & Eastern.....	905	1,213,117	126,641	1,406,338	129,518	168,880	5,435	186,795	11,706	455,976	31,216	374,760	51,088
Galveston, Houston & Texas.....	334	276,871	104,550	411,882	26,414	56,276	15,760	137,592	8,599	320,68	32,68	36,565	36,565
Georgia.....	334	276,871	104,550	411,882	26,414	56,276	15,760	137,592	8,599	320,68	32,68	36,565	36,565
Georgia, Southern & Florida.....	90,691	155,402	267,643	383,993	51,382	93,382	15,390	90,691	15,390	167,315	167,315	161,116	161,116
Grand Rapids & Indiana.....	575	348,557	207,164	610,994	67,196	151,844	34,315	21,320	65,035	71,79	172,369	146,644	7,779
Grand Trunk Western.....	347	500,000	165,000	764,986	108,942	151,554	19,513	348,135	19,513	500,000	165,000	764,986	146,644
Hocking Valley.....	1,012,012	1,709,965	1,012,012	1,709,965	108,558	2,421,442	179,925	5,448,300	72,540	2,077,264	374,040	1,212,638	88,173
Illinois Central.....	4,766	5,330,247	1,613,224	7,525,564	464,648	69,931	3,252	2,207,799	11,978	6,059,229	1,109,136	500,594	879,675
Indiana Harbor Belt.....	109	285,410	41,270	357,014	44,256	117,261	4,346	269,635	12,724	357,014	44,256	117,261	4,346
Kanawha & Michigan.....	177	285,410	41,270	357,014	44,256	117,261	4,346	269,635	12,724	357,014	44,256	117,261	4,346
Lake Erie & Western.....	2,070	1,856,912	1,856,912	3,713,824	1,283,462	119,059	2,691,671	129,643	4,414,441	119,059	2,691,671	129,643	4,414,441
Louisville & Nashville.....	2,070	1,856,912	1,856,912	3,713,824	1,283,462	119,059	2,691,671	129,643	4,414,441	119,059	2,691,671	129,643	4,414,441
Louisville, Henderson & St. Louis.....	2,070	1,856,912	1,856,912	3,713,824	1,283,462	119,059	2,691,671	129,643	4,414,441	119,059	2,691,671	129,643	4,414,441
Maine Central.....	1,216	705,644	44,558	1,263,366	152,087	177,133	13,107	551,577	35,083	95,166	7,682	87,453	-52,319
Midland Valley.....	382	184,866	55,249	251,119	32,727	28,205	4,375	1,124,933	66,47	77,639	35,310	77,639	1,683
Minneapolis & St. Louis.....	2,357	1,856,912	1,856,912	3,713,824	1,283,462	119,059	2,691,671	129,643	4,414,441	119,059	2,691,671	129,643	4,414,441
Missouri, Kansas & Nebraska.....	4,365	1,856,912	1,856,912	3,713,824	1,283,462	119,059	2,691,671	129,643	4,414,441	119,059	2,691,671	129,643	4,414,441
Missouri, St. Paul & South Ste. Marie.....	4,228	2,872,324	623,803	3,135,822	352,872	441,113	4,932	1,126,933	66,47	2,010,223	64,11	1,125,499	40,717
Missouri & North Arkansas.....	365	75,571	13,000	17,435	17,435	17,435	17,435	17,435	17,435	17,435	17,435	17,435	17,435
Missouri, Okla. & Gulf of Texas.....	9	18,727	19,474	1,048	1,652	1,192	3,028	916	7,837	40,24	11,637	11,454	1,313

Operating	Net from operation	Railway operating accruals	Operating (or loss)	Increase (or decrease) last year
68.31	\$709,273	\$87,000	\$622,181	\$202,080
67.71	14,244,249	1,176,075	13,067,164	2,271,696
69.04	398,286	83,000	315,286	42,351
67.25	\$61,128	\$20,644	\$40,534	\$20,705
65.34	214,354	83,474	130,880	73,556
62.35	1,792,112	178,251	1,613,861	284,460
62.38	76,132	10,500	59,632	749
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67.25	\$61,128	\$20,644	\$40,534	\$20,705
65.34	214,354	83,474	130,880	73,556
62.35	1,792,112	178,251	1,613,861	284,460
62.38	76,132	10,500	59,632	749
68.31	\$709,273	\$87,000	\$622,181	\$202,080
67.71	14,244,249	1,176,075	13,067,164	2,271,696
69.04	398,286	83,000	315,286	42,351
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68.31	\$709,273	\$87,000	\$622,181	\$202,080
67.71	14,244,249	1,176,075	13,067,164	2,271,696
69.04	398,286	83,000	315,286	42,351
67.2				

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF SEPTEMBER, 1917—Continued

Name of road.	Average mileage operated during period.	Operating revenues—				Trans- por- tation.	General.		Operating from operation.	Operating accruals.	Increase (or decr.) last year.
		Freight.	Passenger.	Total.	Maintenance of way and structures.	Equip- ment.	Way and structures.	Total.			
Missouri Pacific	7,301	\$4,392,688	\$1,403,903	\$5,796,591	\$954,120	\$1,008,735	\$136,403	\$1,094,523	\$2,056,396	\$435,000	\$1,629,396
Monte & Ohio	1,168	168,270	18,800	187,070	33,881	32,439	37,692	70,520	68.42	63,558	211,774
Monongahela Connecting & St. Louis	1,237	862,349	379,606	1,241,955	109,715	25,965	26,716	136,631	79,113	6,000	73,113
New Orleans & Northeastern	204	295,978	110,445	406,423	68,183	9,681	135,193	183,876	345,522	100,000	243,522
New Orleans, Great Northern	255	1,431,606	124,088	1,555,694	187,041	253,733	58,826	62,234	76,78	10,432	64,202
New York, New Haven & Hartford	1,997	3,421,109	\$553,157	\$3,974,266	835,914	1,050,963	38,817	3,026,204	345,555	55,000	290,555
New York, Ontario & Western	568	475,145	190,483	665,628	804,570	102,135	127,513	19,927	571,215	71,000	233,355
New York, Philadelphia & Norfolk	112	388,061	180,170	568,231	43,582	4,919	185,398	7,794	337,864	40,000	193,555
Norfolk Southern	6,018	2,718,375	1,573,236	4,291,611	824,349	856,367	104,156	3,492,404	59,007	617,169	2,387,710
Omaha, R. & Land Co.	9	3,811,136	1,301,085	5,112,221	11,205	10,730	34,924	5,132	57,375	7,685	49,690
Pennsylvania Company	1,755	4,799,152	1,379,856	6,179,008	869,390	1,204,055	91,317	2,081,538	2,007,509	457,000	1,550,427
Pennsylvania Railroad	4,563	15,420,195	22,998,820	38,419,015	4,236,115	23,292,222	90,888,336	504,613	12,061,377	868,031	5,003,771
Peter & Pekin Union	219	1,138,847	5,610	1,144,457	1,001,300	17,022	39,072	77,632	79,907	63,644	516,262
Philadelphia, Baltimore & Washington	2,718	1,911,310	1,442,968	3,354,278	345,554	537,629	32,441	1,182,715	1,030,339	90,999	939,330
Pittsburgh & Lake Erie	225	1,488,273	232,475	1,720,748	243,997	315,099	151,619	664,410	966,151	209,600	756,551
Pittsburgh & West Virginia	63	141,212	11,401	152,613	28,403	2,644	41,553	6,048	96,797	9,442	56,316
Pittsburgh, Cincinnati, Chic. & St. Louis	2,399	4,052,802	1,451,517	5,504,319	1,257,408	1,014,537	104,145	1,358,547	1,350,454	167,745	1,182,703
Richmond, Fredericksburg & Potomac	468	205,557	141,796	347,353	42,630	61,030	11,287	159,598	9,283	285,044	17,850
St. Joseph & Great Island	238	139,963	30,289	170,252	134,338	7,241	21,67	72,260	243,781	133.33	59,562
St. Louis-San Francisco	4,752	3,291,935	1,587,449	4,879,384	533,596	832,238	68,292	1,670,289	124,258	32,116	61,91
Southern	6,983	4,959,427	2,650,304	7,609,731	1,273,910	1,64,085	2,849,433	176,788	2,673,949	4,800	2,573,949
Tennessee Central	436	698,427	71,242	769,669	361,504	131,509	7,732	299,519	10,499	548,426	65,06
Toledo, St. Louis & Western	455	559,098	51,659	610,757	91,074	97,453	18,894	207,496	13,289	428,034	66,67
Trinity & Brazos Valley	369	68,312	97,556	165,868	25,308	28,008	2,524	40,493	7,990	103,824	106.43
Union R. of Baltimore	8	108,096	50,373	158,469	12,632	8,981	17,631	2,676	504,502	94.16	19,140
Union R. of Pennsylvania	17	124,663	53,671	178,334	15,658	22,513	5,413	5,602	125,200	64.14	69,988
Virginia, Shenandoah & Potomac	513	696,114	63,310	759,424	70,916	125,652	5,768	266,077	15,583	861,866	56.42
Wabash	2,519	2,465,286	764,540	3,229,826	354,240	453,890	79,228	1,400,840	74,938	2,383,191	62.29
Washington Southern	36	57,604	118,931	176,535	14,079	20,731	1,723	70,116	112,060	49,994	212,334
West Jersey & Seashore	359	238,253	59,645	297,898	132,115	17,792	13,32	350,985	64.93	377,428	13,118
Wheeling & Lake Erie	1,352	1,166,835	312,829	1,479,664	263,657	263,999	22,537	479,911	538,953	119,401	409,597
Yazoo & Mississippi Valley	1,352	1,166,835	312,829	1,479,664	263,657	263,999	22,537	479,911	538,953	119,401	409,597

NINE MONTHS OF CALENDAR YEAR, 1917

Alabama & Vicksburg	143	\$1,009,587	\$352,107	\$1,361,694	\$266,155	\$207,257	\$45,292	\$308,973	\$55,942	\$1,099,000	73.05
Alabama Great Southern	312	3,350,520	1,214,093	4,564,613	1,207,257	1,008,735	136,403	1,344,990	2,056,396	435,000	\$87,206
Alton & Springfield	815	7,731,250	2,711,093	10,442,343	1,701,846	1,701,846	1,701,846	3,403,692	3,403,692	7,838,695	335,265
Altamaha & Santa Fe	2,024	1,009,587	352,107	1,361,694	266,155	207,257	45,292	308,973	55,942	1,099,000	73.05
Atlantic Coast Line	4,752	3,291,935	1,587,449	4,879,384	533,596	832,238	68,292	1,670,289	124,258	32,116	61,91
Baltimore & Annapolis	20	603,443	312,127	915,570	184,131	274,377	8,764	969,678	64,617	1,511,273	100.37
Baltimore & Chesapeake & Atlantic	28	603,443	312,127	915,570	184,131	274,377	8,764	969,678	64,617	1,511,273	100.37
Birmingham & Montgomery	208	3,781,635	297,443	4,079,078	1,061,738	1,061,738	107,654	2,845,385	189,859	6,252,003	62.48
Birmingham Southern	44	615,111	178,665	793,776	851,108	221,440	7,282	326,034	827,512	23,595	2,223,609
Boston & Maine	2,305	2,465,286	764,540	3,229,826	354,240	453,890	79,228	1,400,840	74,938	2,383,191	62.29
Buffalo & Susquehanna R. R. Corp.	253	1,415,341	54,866	1,470,207	402,504	1,678,615	323,758	2,815,282	1,051,073	3,367,037	77.92
Buffalo, Rochester & Pittsburgh	1,919	7,132,794	2,447,211	9,580,005	1,697,181	1,901,968	387,297	3,727,430	70,112	8,870,542	72.62
Central of New Jersey	684	2,027,766	313,377	2,341,143	2,688,103	1,981,667	282,693	10,900,751	599,182	18,913,538	68.06
Central New England	301	3,522,845	770,715	4,293,560	698,963	389,267	11,092	1,428,365	81,381	2,611,386	83.63
Central Vermont	411	2,329,543	719,905	3,049,448	330,371	502,746	74,018	1,679,602	94,014	1,701,617	83.35
Charleston & Western Carolina	2,424	31,762,522	3,690,369	35,452,891	3,931,790	3,931,790	31,762,522	3,931,790	3,931,790	3,931,790	3,931,790
Chesapeake & Ohio	1,033	1,028,852	3,579,384	4,608,236	1,608,399	3,007,807	53,147	8,352,108	327,603	28,000,000	70.77
Chicago & Eastern Illinois	1,131	11,722,833	2,538,946	14,261,779	15,666,463	10,922,923	3,844,105	24,420,359	369,789	12,065,775	77.51
Chicago & Erie	269	5,723,906	441,959	6,165,865	1,455,151	592,229	832,001	1,762,255	2,991,716	158,339	47,600,845
Chicago & Northwestern	8,108	52,866,090	19,101,562	71,967,652	10,579,051	12,986,285	1,626,342	31,776,922	1,719,239	68,616,411	80.48
Chicago, Detroit & Can. Grd. Trk. Jctn.	1,496	8,231,816	2,811,120	11,042,936	2,054,438	2,054,438	14,077	4,619,769	379,341	9,263,313	76.55
Chicago Great Western	1,433	11,722,833	2,538,946	14,261,779	15,666,463	10,922,923	3,844,105	24,420,359	369,789	12,065,775	77.51
Chicago, Milwaukee & St. Paul	10,280	58,168,709	15,861,876	74,030,585	8,361,130	8,361,130	1,114,232	34,806,216	48,900	2,101,857	86.83
Chicago, Peoria & St. Louis	255	1,999,856	217,569	2,217,425	192,469	346,798	53,917	678,687	53,917	1,325,038	83.10

First Shipments of Tobacco to Railway Regiments

The Railway Regiments' Tobacco Fund has now become large enough for the commencement of shipments to the railway regiments in France, and the committee in charge of the fund, of which F. A. Poor is chairman, has ordered the first shipment to be made on December 1. The shipment on that date will consist of nine cases of tobacco, one for each of the railway regiments now in France. Each case will contain twelve 20 lb. packages of tobacco and each package will contain 15 pounds of Bull Durham in one ounce bags with the necessary cigarette papers and five pounds of Tuxedo smoking tobacco in one ounce bags. The tobacco will be delivered to the Quartermaster's Department of the United States army in New York City and the Quartermaster's Department will handle the shipments to Europe.

Additional contributions have been received for the Railway Regiments' Tobacco Fund from nine more railway supply companies. The following list brings the subscriptions to date to Tuesday noon, November 13:

Belle City Malleable Iron Co., Racine, Wis.....	\$10 a month
Hunt-Suiler Manufacturing Corporation, Boston, Mass.....	10 a month
H. C. Holloway, Chicago.....	10 a month
Locomotive Superheater Co., New York.....	10 a month
(to cover 1 year to Nov., 1918)	120
Milwaukee Coke & Gas Co., Milwaukee, Wis.....	10 a month
Pittsburgh Wood Preserving Co., (to cover 2 months)	20
Strobel Steel Construction Co., Chicago.....	10 a month
St. Louis Frog & Switch Co., St. Louis, Mo.....	10 a month
T. W. Snow Construction Co., Chicago.....(to cover 3 months)	30

Licenses to Use Explosives

Any person in the United States found with explosives in his possession after November 15, and who does not have a license issued by the Federal government showing the purpose for what the explosives are to be used, will be at once arrested and may be fined up to \$5,000 or sent to prison for one year, or both.

This law, passed by the last Congress, is now being put into effect by the Bureau of Mines, Department of the Interior. Francis S. Peabody, of Chicago, has been appointed to act as assistant to the director of the Bureau of Mines, Van H. Manning, in the enforcement of the law. Persons apprehended in plots to blow up factories and bridges will be turned over to the authorities for prosecution under Federal or state laws.

The law provides that everyone who handles explosives must have a license. The manufacturer, the importer and the exporter must have licenses issued by the Bureau of Mines in Washington. The seller of explosives and the purchaser of explosives must also have licenses, these to be issued generally by county clerks, or other local officers, who are authorized to administer oaths. There will be at least one licensing officer in each county. In each state there will be appointed a state explosives inspector, who will represent the Bureau of Mines in the administration of the law within the state. Contractors and others using large quantities of explosives may issue explosives to their employees only through those employees holding a license, called a foreman's license.

Railway Revenues and Expenses, August, 1917

The net operating income of the railways of the United States for August, 1917, was less than August, 1916, by \$35 per mile, or 7.5 per cent, according to the monthly bulletin of the Bureau of Railway Economics.

Total operating revenues, \$365,316,147, exceeded those for August, 1916, by \$38,116,778. Operating expenses, \$246,341,511, were greater by \$42,843,772. Net operating revenue, \$118,974,636, decreased \$4,726,994. Taxes, \$16,999,686, increased by \$3,383,173. Net operating income was \$101,917,702, which is a decrease of \$7,998,991.

If spread over the mileage represented, operating revenues averaged \$1,581 per mile, an increase over August, 1916, of 11.4 per cent; operating expenses per mile, \$1,066, were greater by 20.8 per cent; net operating revenue per mile, \$515, shows a decrease of 4.0 per cent; while net operating income per mile, \$441, decreased 7.5 per cent. Taxes per mile rose 24.6 per cent.

This summary covers 231,108 miles of operated line, or about 90 per cent of the steam railway mileage of the United States.

AUGUST RESULTS PER MILE OF LINE BY DISTRICTS

For the Eastern railways, operating revenues per mile were greater than those for August, 1916, by 13.3 per cent; operating expenses rose 23.5 per cent; net operating revenue decreased 5.1 per cent; taxes increased 16.3 per cent. Operating income per mile decreased 7.2 per cent.

REVENUES AND EXPENSES OF STEAM RAILROADS—AUGUST, 1917
Compiled from monthly returns of the railways to the Interstate Commerce Commission and covering roads of Class 1, i. e., roads with annual operating revenues above \$1,000,000.

Account	UNITED STATES				EASTERN DISTRICT				SOUTHERN DISTRICT				WESTERN DISTRICT			
	Per mile of line—				Per mile of line—				Per mile of line—				Per mile of line—			
	Amount, 1917	Amount, 1916	Increase over 1916, Per cent		Amount, 1917	Amount, 1916	Increase over 1916, Per cent		Amount, 1917	Amount, 1916	Increase over 1916, Per cent		Amount, 1917	Amount, 1916	Increase over 1916, Per cent	
Total operating revenues.....	\$365,316,147	\$1,581	11.4		\$167,473,556	\$2,837	18.2		\$52,214,155	\$1,221	18.6		\$145,628,436	\$1,126	7.5	
Freight.....	249,650,693	1,050	9.5		112,759,042	1,910	12.1		37,104,208	865	16.3		99,787,343	772	5.1	
Passenger.....	81,644,809	353	30.4		37,362,976	633	54.5		11,405,914	267	27.9		32,875,919	224	13.3	
Mail.....	4,823,300	21	22		1,904,836	32	3.3		733,747	17	18		2,184,807	17	19	
Express.....	9,091,359	39	33		4,282,048	72	61		1,235,631	29	22		3,623,680	28	22.1	
All other.....	20,105,896	87	74		11,214,654	190	162		1,734,555	40	34		7,156,687	55	47	
Total operating expenses.....	246,341,511	1,066	20.8		117,177,002	1,985	16.9		36,066,748	843	18.3		93,097,761	720	16.7	
Maintenance of way and structures.....	42,267,009	183	17.5		18,036,755	306	28.2		6,614,733	155	14.3		17,615,921	136	13.7	
Maintenance of equipment.....	59,809,644	259	22.2		28,062,807	475	41.7		9,880,926	231	18.9		21,865,911	169	14.4	
Traffic.....	5,594,229	24	23		2,353,855	40	35		979,421	23	22		2,261,053	18	18.1	
Transportation.....	128,582,103	556	42.3		63,981,931	1,084	80.2		17,303,806	405	29.4		47,296,366	365	29.1	
General.....	7,905,865	34	31		3,458,192	59	53		1,166,021	27	25		3,281,652	26	22	
All other.....	2,182,261	10	8		1,283,462	21	19		121,941	3	8.7		776,858	6	5	
Net operating revenue.....	118,974,636	515	5.6		50,296,554	852	8.9		16,147,407	378	35.3		52,500,675	406	43.1	
Taxes.....	16,999,686	74	59		6,089,705	103	88		3,030,458	71	43		7,879,523	61	51	
Uncollectible revenues.....	52,448	*	1		27,280	*	2		6,668	*	....		23,300	*	....
Operating income.....	101,917,702	441	47.6		44,179,569	749	80.7		13,110,281	307	310		44,627,852	345	380	
Operating ratio—per cent—																
1917.....	67.43				69.97				69.07				63.93			
1916.....	62.19				54.17				65.70				58.88			
Average mileage represented—																
1917.....	231,108				59,031				42,767				120,310			
1916.....	230,680				59,413				42,674				128,795			

* Less than one dollar.

For the railways of the Southern district, operating revenues per mile exceeded those for August, 1916, by 18.6 per cent; operating expenses rose 24.7 per cent; net operating revenue increased 6.9 per cent; taxes increased 63.6 per cent. Operating income per mile decreased 1.0 per cent.

For the Western railways operating revenues per mile exceeded those for August, 1916, by 7.5 per cent; operating expenses rose 16.7 per cent; net operating revenue decreased 5.7 per cent; taxes increased 20.4 per cent. Operating income per mile decreased 9.2 per cent.

EIGHT MONTHS OF THE CALENDAR YEAR 1917

The eight months of the current calendar year, compared with the corresponding period of the preceding year, show changes per mile of line as follows: Operating revenues increased 11.9 per cent, operating expenses increased 18.6 per cent, net operating revenue decreased 1.3 per cent, taxes increased 20.5 per cent, while operating income decreased 4.5 per cent.

Operating income per mile decreased 15.9 per cent in the East, increased 3.3 per cent in the South, and increased 5.5 per cent in the West.

COMPARATIVE AUGUST RESULTS PER MILE OF LINE, 1913 TO 1917

August net operating income per mile was 7.5 per cent less in 1917 than in 1916, 17.7 per cent greater than in 1915, 31.0 per cent greater than in 1914, and 30.4 per cent greater than in 1913.

Electric Railways to Have War Board

The pressing need of utilizing to its fullest extent every possible means of transportation within the United States, in order that the business of the country may be carried on under war conditions, has led to the appointment by the American Electric Railway Association of a War Board, which will be organized on similar lines to the War Board of the steam railroads, have headquarters in Washington, and work in close co-operation with the Council of National Defense. The Board will consist of the following: Arthur W. Brady, president, Union Traction Company of Indiana, Anderson, Ind.; Thomas N. McCarter, president, Public Service Railway Company, Newark, N. J.; Britton J. Budd, president, Chicago, North Shore & Milwaukee Electric Railroad, Chicago; L. S. Storrs, president, The Connecticut Company, New Haven, Conn., and P. H. Gadsden, president, Charleston Consolidated Railway & Lighting Company, Charleston, S. C.

The action of the association was taken at a meeting attended by a large number of the leaders of the industry, representing companies in 27 states. The need of utilizing every transportation facility now available for the movement of men and goods was emphasized. The possibility of co-ordinating the facilities of electric railways and developing them to an extent where they can supplement the steam railroads, or relieve the steam roads of some of the work which has been put aside for the government business was discussed. In many sections of the country, this is already being done and it was felt that the Government should be offered the direct co-operation of the electric lines, both urban and interurban.

Opposition to Federal Incorporation

S. Davies Warfield, president of the Continental Trust Company of Baltimore, in an address before the Investment Bankers' Association, said, in part:

"Federal incorporation is not only fraught with danger to the people generally, in that it takes five out of six steps towards Government ownership, but is a menace to the holders of all classes of securities, for it proposes the greatest autocracy in corporate management yet suggested and, if enacted into law, will not alone apply to railroad corporations, but sooner or later the same principle would likely be extended to all corporations engaged in interstate commerce. And aimed as it is at the public service commissions of the several states, it is an encroachment on the rights of the states to regulate their own affairs, when not inconsistent with public interest. It is revolutionary in its purposes and effects.

"The plan is, not that the carriers may have the right to incorporate under a federal act, giving up their state charters, but that the act will arbitrarily compel the carriers to take out charters under the federal act. To accomplish this, since no other means has been thus far shown for its accomplishment, it will be necessary for all existing interstate railroad companies,

organized under state charters, to sell all their properties to new corporations to be organized under a federal act—changing the very fundamentals incident to present railroad existence—a plan so sweeping as to demand the attention of every stockholder and bondholder of every railroad in the United States.

"Practically all lawyers, other than counsel for the particular companies who are advancing this legislation, are agreed that after the passage of any such bill as has been proposed, the legal status of existing railroad companies would be most uncertain, and pending a final decision by the various courts of the many questions which would arise, the situation would be chaotic.

"The power in Congress to amend or repeal the charters, subject only to a distribution of the property of the corporation whose charter is repealed, will furnish a club to Congress which can be used with most destructive effect."

Mr. Warfield points out that notwithstanding the executives of some of the railroads have testified before the Newlands Committee in favor of the federal incorporation of railroads, there was no evidence that this question had been submitted to the stockholders and directors of their companies.

Mr. Warfield then said: "The use of the term 'railway executives' rather implies unanimity. In point of fact I know a large number of railroad executives who do not favor federal incorporation. One of the railroad executives when testifying in favor thereof before the Newlands Committee admitted that there are many railroad companies that really would prefer to continue as they are."

Comforts for the Men in the 14th Railway Engineers

The railways in New England under the leadership of J. H. Hustis, president of the Boston & Maine and chairman of the Northeastern Department for the Railroads' War Board, have perfected an organization having for its purpose the collection of funds and the expenditure for comforts for the men from those railroads who compose the 14th Railway Engineers now operating railways behind the lines in France.

The 14th Railway Engineers are composed entirely of railway men from the New England railroads: two companies from the Boston & Maine, two from the New York, New Haven & Hartford, one from the Boston & Albany and one from the Maine Central, with men also from the Central Vermont, the Rutland, and the Bangor & Aroostook. Each railroad has established a committee, the work of these committees being co-ordinated through a central committee made up of one representative from each of the lines, one from the Traffic Club of New England and one from the New England Railroad Club, which acts to a very large extent on the advice of Colonel Wooten, commanding the regiment. The idea is that the funds collected from the employees of any one railroad are to be spent for the men from that railroad in the regiment. Thus the funds collected on the New Haven, and the knitting and other work done by the lady friends of the members of the two New Haven companies, E and F, are to be devoted to those two companies. The same will apply to the two companies recruited on the Boston & Maine, and one company each recruited on the Boston & Albany of the Maine Central. The Maine Central will take care of the Bangor & Aroostook men and the Boston & Maine will look out for those recruited from the Central Vermont and the Rutland. That is, these roads will pool their collections with those of the Maine Central in the first case and the Boston & Maine in the two last named cases.

In the Boston & Maine's scheme of carrying out the plan, local committees have been formed on each division, with one for the general offices and the Boston Terminal, to arrange for the collection of funds and to administer their distribution in co-ordination with a central committee, and to arrange for organizations of the ladies for knitting socks, sweaters and other wearing apparel. The superintendent of each division is authorized to receive contributions from employees and friends of the men in the railroad regiment, on their respective divisions, and to acknowledge receipt of such contributions, which are forwarded to the treasurer of the Boston & Maine, at Boston, who is treasurer of the Boston & Maine's Central Committee. That committee is composed of one representative from each division and from the general offices. The management has heartily indorsed the plan, and has suggested that individual subscriptions should not exceed \$1.

With this organization the Boston & Maine has raised \$6,157.84

in cash. With the money it is providing a Christmas box with pipe, pouch, tobacco, chocolate, socks and wristlets. It will also send a sweater to each of the road's 403 men now overseas and will send tobacco at least once a month.

Substantial sums have already been collected, and it is the intention not only to send generous Christmas gifts, but also to undertake a continuous work of providing some form of comfort for the boys.

The Traffic Club of New England and the New England Railroad Club acting jointly have already dispatched a box of candy and a flint and steel pipe lighter to each of the 1,200 men in the regiment.

Western Railway Club Meeting

The next meeting of the Western Railway Club will be held at the Hotel Sherman, Chicago, on Monday, November 19. W. T. Krausch, engineer of buildings of the Chicago, Burlington & Quincy, will present a paper on "Coaling Plants and Fuel." The subject will be considered with special reference to the conservation of fuel, in accordance with the policy which the club has followed this year of taking up problems having a particular bearing on the operation of the railroads during the war. E. P. Ripley, president of the Atchison, Topeka & Santa Fe, will give an informal address.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August. 220 W. 57th St., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, Supt. Timber Preservation, R. & O. Mt. Royal Sta., Baltimore, Md. Next convention, January 22-24, 1918, Hotel Sherman, Chicago.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—W. L. Connelly, Superintendent of Telegraph, Indiana Harbor Belt, Gibson, Ind. Next meeting, November 22, La Salle Hotel, Chicago.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert, Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Astor Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Morrison Hotel, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CINCINNATI RAILWAY CLUB.—F. H. Boulet, Chief Interchange Inspector, Cin'tl Ry., 101 Carey Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Miles, 568 Union Arcade Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

FABRICHT CLAIM ASSOCIATION.—Warren P. Taylor, Traffic Manager, R. F. & P., Richmond, Va. Next meeting, November 27, Vanderbilt Hotel, New York.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.

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

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 2d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Geo. A. J. Hochgrebe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PACIFIC RAILWAY CLUB.—W. J. Wollmer, Assistant to Chief Engineer, Northwestern Pacific R. R., San Francisco, Cal.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial Annex Hotel, Pittsburgh, Pa.

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

SOUTHERN & NORTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.

TRAFFIC CLUB OF CHICAGO.—C. R. Singer, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Sager, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

WESTERN SOCIETY OF ENGINEERS.—Edgar S. Nethercut, Secretary, 1735 Monadnock Block, Chicago, Ill. Regular meeting, first Monday in month, except January, July and August. Extra meetings generally on other Monday evenings except in July and August.

Traffic News

The coast-wise vessels of the Great Northern Pacific Steamship Company, plying between Portland, Ore., and San Francisco, Cal., were taken over by the government the latter part of September.

The Commission on Car Service estimates that the quantity of potatoes raised in this country this year will amount to 453 million bushels, 50 per cent more than in 1916; and to move these potatoes will require 75,000 cars.

Irving T. Bush, who has been appointed director of the Port of New York acting under a Port War Board, says that he expects that the storage and lighterage facilities of the port can be made 25 per cent more efficient than they are at present.

Judge Lovett has cancelled his order directing that priority be given to shipments of soft coal for ports on Lake Superior and Lake Michigan, in so far as it applies to points on the Pittsburgh, Cincinnati, Chicago & St. Louis east of Steubenville, Ohio.

Judge Lovett, acting at the request of the Fuel Administration, has suspended for one day, November 19, his order requiring priority to be given to shipments of coal for the Northwest; this for the purpose of allowing all coal to be sent to cities in Ohio and Michigan.

The Pennsylvania Railroad has announced a sweeping embargo on freight from all connecting lines with the exception of live stock, perishable freight, foodstuffs for human consumption, government shipments and other items, for the purpose of clearing up congestion.

The Baltimore & Ohio, acting on the suggestion of the government to discontinue the use of luxurious cars, which are run merely for entertainment of the passenger, has met the pressing requirements of the time to the extent of eliminating the observation sleeping cars on all of the trains running between New York and Chicago.

On 77 of the principal railroads of the United States a saving of 114,109 cars was effected in one month (July) this year, as compared with 1916 solely by increasing the average loading of 1 c. l. freight. The reports show that the average loading for that class of freight during July of this year was 13,927 lb., as compared with an average of 11,619 lb.

The Department of Agriculture of the State of Pennsylvania has made a special appeal to the Food Administration at Washington to limit the use of freight cars as storehouses; and the definite statement is made that on one day last week 250 carloads of potatoes were standing in Philadelphia and that the consignees were paying demurrage on them, at the regular rates, and making no efforts to sell the potatoes.

The Transportation Club of San Francisco on November 7 held a noon-day luncheon in honor of the members of the Newlands congressional committee which has been holding hearings in San Francisco: Senators F. G. Newlands and A. B. Cummins and Congressmen J. J. Esch and T. W. Sims. Hon. A. P. Thom, general counsel of the Railway Executives' Advisory Committee, Washington, D. C., was scheduled to deliver an address at the luncheon.

It is estimated that over 400,000,000 pounds of parcel post packages will be handled by the Post Office Department this month and next. The total number of parcel post packages mailed in the United States in the year ended June last was 1,024,362,744, weighing 1,926,932,904 lbs. In November, 1916, the number of packages was (in round numbers) 80,000,000, weighing 160,000,000 pounds, and in December 100,000,000 packages, weighing 200,000,000 pounds.

The three railroads entering Boston—the Boston & Maine, the New Haven and the Boston & Albany—have petitioned the Interstate Commerce Commission and the state commissions for authority to increase passenger fares. It is proposed to increase the rate for single tickets from 2 or 2½ cents to 2¾ cents a mile; to increase the mileage book rate from 2¼ to 2½ cents a mile; to make certain charges in trip tickets; to increase 25 per cent

the rate on 12 and 25 ride suburban tickets good within 15 miles of Boston, and to withdraw the so-called workmen's tickets.

The Baltimore & Ohio announces that henceforth the dining cars on that road will recognize Tuesday as a "meatless day" instead of a "beefless day." On these days none of the dining cars will serve meat in any form. Wednesday will be observed as a "wheatless day" and no breads or cakes or desserts will be served which are made from wheat. The announcement says that this is done at the direct request of the government food administration; the Baltimore & Ohio Railroad is a member of that administration and "all instructions from headquarters will be strictly observed."

Increasing its efforts to reduce the waste in the distribution of time-tables, the Northern Pacific has devised a plan which accomplishes that end and at the same time helps get new passenger business. The scheme was conceived by J. D. Zook, city passenger agent at St. Paul, Minn. It places the time-tables in the cashier's cage and posts conspicuous signs directing prospective travelers to ask the cashier for folders. The plan enables the cashier to speak to many potential patrons of the road, to set forth the advantages of the company's service and to help them plan their trips. In this way he learns the destination of many additional prospective passengers and often sells them tickets.

When a shipper, in sending an important consignment of freight, gives notice that prompt movement is important, because of some special reason, it behooves the station agent to take good care to carry out the shipper's wishes (or, in case of his inability to do so, to give good notice of the fact and advise his superior). The Southern Pacific Company, in its monthly circular to station agents, calls attention to this important feature of the freight agent's duties, taking as its text for the lecture an account of a suit which cost some railroad \$75,000 because a shipment of building material which was delayed and, because of the delay, retarded, by about 11 months, the completion of a government contract.

The Interborough Rapid Transit Company, operating elevated and subway lines in New York City, mainly in the boroughs of Manhattan and the Bronx, now carries about 1,350,000 passengers daily, or about 185,000 more than the average, two years ago. A considerable part of this increase is accounted for by extensions of the lines and by the addition of express tracks on the elevated lines. A circular which has been issued by the company says that of the 1,350,000 passengers carried daily, about 900,000 ride in the rush hours, three hours in the morning and three in the afternoon. About 15,000 are unloaded each afternoon at Times Square to go to matinees, and about 18,000 to attend theatres in the evening. Of this latter number about one-third remain in the theatrical district until 1 o'clock in the morning.

The discovery of a large dump of potatoes and other vegetables in railroad yards at West Chicago, Ill., last week, prompted an investigation by government authorities of what was apparently a great waste of food products. It was found, however, that an early and severe frost had damaged many shipments in cars not provided with heating facilities. In many cases potatoes had been shipped from points of origin in a frosted condition, and some of the railroads had protected themselves from claims by stationing inspectors at the larger shipping points to determine the condition of vegetables before they are loaded. Much farm produce has been damaged by holding cars too long in large terminals for reconsignment, and Harry A. Wheeler, Illinois state food administrator, has announced that beginning this week an inspection service will be put on in the principal yards in the state. The railroads have agreed to file with the Food Administration a daily report of all cars of vegetables received, thus making it possible to check up responsibility for carelessness and waste. Mr. Wheeler has also recommended that the privilege of reconsignment of cars loaded with vegetables be revoked.

Vice-President G. L. Peck, of the Pennsylvania Lines West, chairman of the Lake Coal and Ore Committee of the Railroads' War Board, reports that the task set the railroads, to haul 29,000,000 tons of coal from the mines to the Great Lakes ports, receiving return cargoes of ore for the interior furnaces, before ice closed navigation, has been well taken hold of. Up to No-

vember 4, there had been loaded 24,170,713 tons, which was an increase of 710,127 tons, or 3.03 per cent, as compared with the same date last year, leaving 4,829,287 tons of the original estimate to be transported during about 28 days of open lake navigation.

The week ended November 4, the latest reported, showed 822,613 tons of coal delivered to boats at Lake Erie, and 798,971 tons of ore carried back to the furnaces. He says that most of the furnaces are now pretty well supplied with ore, and some of the largest plants have already received their full allotment for the season. The pooling of Lake coal has saved car detention amounting to about 520,000 car-days. Great benefit has resulted from the harmonious working of all interests to a common end. This is growing more apparent among the employees every day.

Soldiers' Fares on the Boston & Maine

Camp Devens at Ayer, Mass., 36 miles from Boston, is now the daily destination of hundreds of thousands of passengers from all parts of New England; and the Boston & Maine has received numerous and persistent applications for a reduction in fares. In its last reply the road says:

"The only way in which lower fares can lawfully be given to the soldiers [on furlough] is by means of a special excursion rate to and from Ayer, open to soldiers and civilians alike. If this should be done between Boston and Ayer, it would have to be done also wherever like conditions arise; that is, wherever similar excursions of similar character offer themselves, whether soldiers or civilians.

"The rate between Boston and Ayer is now 2¼ cents a mile, or a one-way rate of 84 cents, making the round trip \$1.68. It has been spoken of as if it were \$1.82 for the round trip, but 14 cents of this is collected by the United States Government as a tax. The Boston & Maine gets only 2¼ cents a mile. This is only ⅓ of a cent higher than the round trip rate which the Long Island Railroad is giving to civilians, to which reference has been made."

"The Boston & Maine is earnestly endeavoring to get increases in its passenger and freight rates in order to properly and efficiently conduct its business for the benefit of the public, and it seems to the management that it ought not to decrease any passenger rates at this time."

Reconsignment Privileges and Intra-City Freight Movements Stopped in Philadelphia

The Philadelphia District Committee on Car Service, consisting of operating and traffic representatives of the three railroads which enter that city—the Pennsylvania, the Philadelphia & Reading and the Baltimore & Ohio—have placed an embargo on all shipments of less-than-carload freight between points within the corporate limits of the city. An embargo was also placed on all reconsignments of either carload or less-than-carload freight within the city limits. Both embargoes became effective on November 15. This action was taken as a further step in conserving the transportation facilities of Philadelphia and the surrounding region, and aiding the plants engaged in manufacturing war material and other necessities to keep in continuous operation.

The purpose of placing these embargoes is to relieve the railroads from the necessity of rendering, in the city of Philadelphia, what is virtually a teaming service, which seriously interferes with the performance of their proper duties as interstate carriers. The practice of shipping freight over the railroad lines from one station to another, within the city limits, has grown to very considerable dimensions, and it requires the use of a large number of cars which otherwise could be devoted to long-distance traffic. It also adds materially to the congestion of railroad tracks in the city, is a drain on labor facilities at freight stations and increases the congestion of teams waiting to load or unload at freight stations.

Owing to the arrangement of the railroad tracks in the city, which have been planned as terminals for long distance traffic, it is often necessary to send intra-city shipments over very circuitous routes in order to make delivery between points only a very short distance apart in an air line.

This involves an amount of shifting which is disproportionate to the character of the service actually rendered to the shipper.

While the embargo on shipments of freight between stations within the corporate limits of the city will apply only to l. c. l. lots, for the present, ultimately the restriction will be extended to carload freight also, and for the same reasons.

The practice of reconsigning freight, after its arrival at one of the railroad stations in the city, to another station within the corporate limits is similar, in its effect, to the making of direct shipments between intra-city points. For service of this kind the railroads receive certain rates which are governed by public tariffs, but it imposes a tax on the railroad facilities out of proportion to the service rendered. In its statement to the public the committee has not only forbidden intra-city shipments, but has placed embargoes on all shipments of freight between points less than 40 miles apart, thus compelling all traffic of that character to be hauled by teams or trucks, in order to relieve the railroad lines, as far as possible, and leave them free for troop movements and long distance freight.

Freight Congestion

Reports of extensive losses of fruit and vegetables in the Western states because of a lack of freight cars, published in New York last week led the New York Times to make inquiries concerning congestion of cars in Cleveland, Pittsburgh, Cincinnati, Memphis, St. Louis and Chicago. At Cleveland considerable congestion is found, caused not only by shortage of cars but inability to obtain help in terminals. However, it is said that there has been little loss or delay at that point thus far. At Pittsburgh there has been serious congestion of perishable freight and the report says that considerable food has actually begun to rot in the cars. It appears that these losses have been due in large measure to the well-known cause, heard of repeatedly in former years, the custom of consigning perishable freight to Pittsburgh before a buyer has been found for it.

At Cincinnati there has been a good deal of congestion, but no large losses of perishable provisions. At Memphis it is denied that there is any congestion of perishable traffic. At St. Louis it is said that fruits and vegetables are moving freely, and this notwithstanding the fact that in Colorado and other regions tributary to St. Louis the crops this year have been 64 per cent greater than last year.

At Chicago large quantities of potatoes, cabbages and other vegetables were refused by consignees because frozen. These shipments were taken to side tracks on the outskirts of the city and unloaded; and the Salvation Army has sorted the good potatoes from the frozen ones and has distributed them among the poor. Newspaper reports of losses by freezing or otherwise are declared to have been greatly exaggerated.

The placing of embargoes on ordinary freight in order to facilitate the movement of perishable goods and all commodities needed by the government is becoming more general. Receiving stations in New York City and Philadelphia are obliged to refuse many important commodities. One eastern railroad, not one of the largest, which carefully summarizes and reissues embargo notices received from its connections, issues several revisions every week; and on November 9 issued four letter-sheet pages of closely printed notices, the last notice in this series being Supplement No. 68 to the last regular embargo notice. How the local freight agent can sleep at night with these puzzles hanging over his head is a mystery to the uninitiated.

The regular weekly tariff bulletin of the New York State Public Service Commission, Second district, usually consisting of three or four large pages, is now devoted largely to embargoes. An example of one of the simplest embargoes, that of the Long Island Railroad, No. 3587, superseding No. 3512 appears in the last Commission Bulletin as follows. (It will be noted that special "shipping days" have been established at Brooklyn stations):

Long Island.—Embargo on less carload freight originating on the Long Island railroad is revised as follows: Effective November 7th, shipments of less carload freight destined to points on foreign lines may be accepted for forwarding on Mondays and Wednesdays only, except such shipments originating at Flatbush Avenue, Bushwick, and Long Island City. Shipments of 10,000 lbs. or more or loaded to cubic capacity of car and loaded by shippers in one car may be accepted and carded direct through to destination point or connecting line transfer. Effective November 8th, and each Tuesday and Thursday thereafter, embargo is placed on all less carload freight originating at Flatbush Avenue. Highly perishable shipments will not be accepted at Flatbush Avenue on Saturdays. Highly perishable l. c. l. freight will be accepted at Jamaica on Mondays, Wednesdays and Fridays only. Embargo continues on l. c. l. freight destined to or origin-

ating at Bushwick. Embargo continues on l. c. l. freight destined to Long Island City; l. c. l. freight originating at Long Island City and destined to local points will not be accepted on Wednesdays and Fridays. Embargo will not apply to freight consigned to or for use of the United States Government; freight for Long Island State Hospital, Kings Park; the Manhattan State Hospital, Central Islip; and material and supplies for the Long Island Railroad. Embargo 3587 (Supersedes Embargo 3512.)

Shipping Days at New York City

"The shipping day plan" for conserving freight cars and saving time of drays by accepting l. c. l. shipments for given destinations on only a part of the days of each week—usually Monday, Wednesday and Friday or Tuesday, Thursday and Saturday—is now in operation in New York City at the stations of three roads, the Pennsylvania, the New York Central and the New York, New Haven & Hartford. On the Pennsylvania the plan was put in use at the beginning of the present week and on the other two roads a week earlier. Each road has issued a convenient pocket manual containing lists of destination stations, large and small. The New Haven road has applied this rule thus far to only two New York City stations, piers 37 and 39. The New York Central book shows six loading stations and the list of destinations includes only those on the company's lines east of Buffalo; but there is a page given to connecting railroads without naming the stations. For most of these connections there are three shipping days a week.

The Pennsylvania's book consists of 113 pages and the stations are arranged both alphabetically and geographically. There is a separate list of the towns west of Pittsburgh. This book shows shipping days from a dozen loading stations, including several in Brooklyn. At some of the stations some of the cars are closed at 3 p. m. and 4:30 p. m. is the hour in most cases.

The New Haven road has issued revised shipping-day circulars at seven New England cities: Boston, Brockton, New Bedford, Fall River, Providence, Pawtucket and Worcester.

Freight will be shipped at the times and days advertised regardless of quantity; that is to say, even if partly filled cars have to be sent.

Illinois Manufacturers Favor Increase in Freight Rates

Substantial shipping interests the country over seem to recognize the justification of the railroads' plea for higher freight rates. A strong endorsement of the position of the carriers comes from the Illinois Manufacturers' Association (John M. Glenn, secretary) which sent the following telegram to the chairman of the Interstate Commerce Commission on November 10:

"The directors of the Illinois Manufacturers' Association * * * respectfully urge that the petition of the carriers in the official classification territory for an advance in freight rates be granted. It is almost the unanimous belief of shippers in the Middle West that in order to maintain the transportation service of the country more money must be paid for the carriage. Please act promptly. We feel the situation is critical."

Heavier Loading Up to Shippers

D. I. Forsyth, vice-chairman of the Chicago Car Service Committee, calls attention to the fact that maximum loading of freight cars is not affected by the Food Administration's rules governing the manufacture and distribution of food commodities. Those rules establish minimum trade units for buying and selling. They provide that carload shipments of certain commodities shall be made in lots of not less than a certain weight; but while the minimum carload weights, as fixed by the Administration, do require shippers to load cars heavier in order to secure carload rates, the carrying capacity of the cars in nearly all cases is much greater. Every freight car should be loaded to its maximum carrying capacity, not merely to the minimum necessary to secure a carload rate of freight. Some of the advances in minimum carload weights ordered by Food Administration are: flour, from 40,000 lb. to 60,000 lb.; syrup and molasses, from 36,000 to 60,000; rice, from 40,000 to 60,000; dried beans and peas, from 40,000 to 60,000; fresh meat and butter, from 20,000 to 24,000; canned vegetables, etc., from 36,000 to 60,000; wheat, oats, corn, rye and barley, to car capacity.

NEW RAILROAD PROJECTED IN MEXICO.—Construction will be begun early in January on a railroad line between Tapachula and San Benito in the state of Chiapas.—*Commerce Report*.

Commission and Court News

STATE COMMISSIONS

The Public Service Commission of West Virginia has authorized a general advance of 15 cents a ton in freight rates on coal.

The Railroad Commission of Kentucky has approved a tariff, agreed upon between the Louisville & Nashville and the coal producers, making considerable reductions in the freight rates on coal from mines in western Kentucky.

The Appellate Division of the New York Supreme Court, First Department, has sustained an order of the Public Service Commission, First District, issued last February, in which the surface railroad lines of the Brooklyn Rapid Transit system were directed to procure 250 new cars for winter use. This is the third court decision adverse to the railroad corporation.

Increased Allowance for Grain Doors

The New York State Public Service Commission, Second District, has issued an order requiring the principal railroads in the state to make an allowance of five mills per 100 lb. of lading for lumber used for grain doors and bulk heads when furnished by shippers of grain and produce in bulk. The opinion is by Commissioner Irvine. It is held that the former allowance of 50 cents a door with a maximum of two dollars a car was inadequate. The shippers declared that the former rate of allowance, reasonable when first made, has become insufficient owing to the rapidly increasing price of lumber. Commissioner Irvine says that evidence is not adequate to enable him to determine what would be a fair average maximum allowance at present prices. The rate of 5 mills per 100 lb. of lading, proposed by shippers, is the only basis at present available. "It may be that owing to very recent increases in prices it is too low; and the time may come when it is too high. . . . The flat allowance heretofore prevailing, inadequate under all circumstances, was an inducement to minimum loading. Moreover the amount of lumber used naturally varies with the load in the car, and the allowance should vary accordingly."

PERSONNEL OF COMMISSIONS

F. W. Putnam, of Red Wing, has been appointed a member of the Minnesota State Railroad & Warehouse Commission in place of E. Elmquist, resigned.

Charles P. Webster, state coal administrator of Iowa, has been appointed a member of the Iowa Board of Railroad Commissioners, succeeding E. D. Chassell, recently resigned to become secretary-treasurer of the Farm Mortgage Bankers' Association of America, at Chicago. Mr. Webster will continue to discharge the duties of coal administrator.

COURT NEWS

Safety Appliance Acts—Equipment of Trains

The Circuit Court of Appeals, Ninth Circuit, holds that the Safety Appliance Acts are mandatory in requiring that trains must not only be equipped to run, but must actually be run, without requiring brakemen to use the hand brakes in the ordinary movement of the trains. The case was before the court for the second time. Ross, C. J. dissented.—*Great Northern v. United States*, 244 Fed., 406. Decided June 25, 1917.

In a case just reported from the Eastern district of Michigan the doctrine of the above decision was followed. It was in a suit where, in certain specified instances, the speed of the trains was controlled by the use of the hand brakes, and not by the use of the power brakes. There was evidence tending to show that by reason of the steep grade the hand braking was safer, but this was held to be immaterial, the question of safety having been determined by Congress when the law was enacted.—*United States v. Grand Rapids & Indiana*, 244 Fed., 609. Decided October 5, 1916.

Reasonableness of Demurrage Charges

In an action by a railroad for demurrage charges of \$1 a day on cars delivered to a steel company, the defendant denied the reasonableness of the charges, but offered no evidence that they were unreasonable. Notwithstanding the railroad offered no proof of their reasonableness, the Pennsylvania Supreme Court held that it was not precluded from recovering, as the reasonableness of such charges was recognized by the Pennsylvania act of May 24, 1917.—*Pittsburgh & Lake Erie (Pa.)*, 101 Atl., 1048. Decided May 22, 1917.

Stop, Look and Listen Rule

The Pennsylvania Supreme Court holds that the duty of one about to cross a railroad track at grade is not always confined to stopping, looking and listening for the approach of a train. He must stop at a proper place, and when he proceeds he should continue to look and to observe the precautions which the dangers of the situation require. He should stop again if there is another place nearer the tracks from which he can better discern whether there is danger. One driving a buggy over a grade crossing was held guilty of contributory negligence when, after stopping, looking and listening when about 90 feet from the track, he did not stop before reaching the track, where he could have seen an approaching train for a distance of three-quarters of a mile.—*Reigner v. Pennsylvania (Pa.)*, 101 Atl., 995. Decided May 22, 1917.

Establishment of Rates by State Commission

The Michigan Supreme Court holds that, where the Railroad Commissioners, under the 1909 statute, determined that rates theretofore published were unreasonable, and established a new schedule of rates, its action, although liable to be set aside by the courts, fixed a legislative rate immediately in effect; and where a railroad company, while contesting the validity of such rates, exacted the old charges, it was liable to shippers therefor. But though the statute authorizes a shipper who has been compelled to pay illegal rates to recover double damages, the provision is one for a penalty, and it is held the penalty should not be assessed against a railroad company where, during the time that it made the illegal exactions, a rate fixed by the Michigan Railroad Commission was suspended by a court of competent jurisdiction.—*Fletcher Paper Co. v. Detroit & Mackinac (Mich.)*, 164 N. W., 528. Decided September 27, 1917.

Things Attractive to Children

In an action against a railroad for a child's death resulting from the rolling of logs left on its premises, a tract of uninclosed land with houses surrounding it, it appeared that some children were jumping from one to another of a pile of logs when one, on which a boy of about 7 years old was astride, began to roll, and killed him. The evidence did not show that children habitually played on the logs or on the tract of land, nor that the depositing of logs there was a new use of the land or that such use created a peril affecting any customary use of the premises by the public. It was held, on appeal from judgment for the plaintiff, that judgment should have been directed for the railroad.—*Sandstrom v. Minneapolis, St. P. & S. S. M. (Mich.)*, 164 N. W., 472. Decided September 27, 1917.

UNITED STATES SUPREME COURT

Powers of States to Regulate Commutation Rates

In a suit by the Pennsylvania, as lessee of the Northern Central, against the Maryland Public Service Commission for an injunction to restrain the commission from enforcing an order requiring the sale of commutation tickets at certain specified rates, the United States Supreme Court holds, affirming 126 Md. 59, that where a railroad company has recognized the propriety and necessity of rendering a peculiar service to suburban communities by establishing commutation rates, a state may, without violation of the Federal Constitution, regulate such rates within the limitation of reasonableness, and may fix rates for the special service rendered regular travelers ("commuters") different from those charged for the general service.—*Pennsylvania v. Towers*, 38 Sup. Ct. Rep. 2. Decided October 15, 1917.

Equipment and Supplies

LOCOMOTIVES

THE CENTRAL OF BRAZIL has ordered 2 Consolidation locomotives from the Baldwin Locomotive Works.

FREIGHT CARS

THE MAGNOLIA COTTON OIL COMPANY, Houston, Tex., is in the market for 10 tank cars.

THE BLISS OIL & REFINING CORP., Tulsa, Okla., is inquiring for 25 8,000-gal. capacity tank cars.

THE INDIANA REFINING COMPANY, Lawrenceville, Ill., is inquiring for 25 8,000-gal. capacity tank cars.

THE MILLER PETROLEUM REFINING COMPANY, Chanute, Kan., is in the market for 10 10,000-gal. capacity tank cars.

THE AMERICAN AGRICULTURAL CHEMICAL COMPANY is in the market for 5 50-ton tank cars for the transportation of sulphuric acid.

PASSENGER CARS

THE DULUTH & IRON RANGE is inquiring for 5 passenger cars.

IRON AND STEEL

THE SIOUX CITY TERMINAL has ordered 109 tons steel from the Frankman Brothers Bridge & Construction Company for a deck plate girder bridge across the Floyd River at Sioux City.

MISCELLANEOUS

THE CENTRAL OF NEW JERSEY recently retained Westinghouse Church Kerr & Co., New York, to design and construct a boiler plant at the railroad's coaling station in Communipaw, N. J. A transmission line will also be built from the railroad's power plant in Communipaw to this coaling terminal.

INCREASED RATES IN ARGENTINA.—Sir Henry Bell, presiding at the annual meeting of the Buenos Ayres Western, said the railways of Argentina had been permitted to increase their rates to cover the increase in wages granted after the recent strike, in addition to the 22 per cent increase in rates granted to cover the higher operating costs, the chief item in which was the cost of coal. The labor situation, however, he remarked, was still unsettled. The crops, he added, were excellent, but he expressed the fear that the roads would not benefit therefrom to any marked degree owing to the shortage of ocean tonnage.

AMERICAN LOCOMOTIVES RUSTING AWAY IN GREECE.—Press despatches from Athens state that ten monster American locomotives are standing on a side track at the Piræus, gradually rusting away for lack of use. They are evidence of the progressive modern methods which a recent government railway administration sought to put into practice without, however, making due calculations in advance. The engines were greatly admired when they arrived, but when they were put on the tracks it was discovered that the light rails almost flattened out with their weight, and the bridges along the main routes were not strong enough for them.

SAID TO BE AUTHENTIC.—Hundreds of women in track gangs are doing the hardest kind of work with pick and spade on the Pennsylvania lines east and west of Pittsburgh. The president of a steel company left his private car to watch the new section hands. "How do you get along with your new workers?" he asked the section foreman a rugged son of Erin. "Foine," confessed the foreman. "In this game you have to call a man every name in the calendar to get him working at top speed, but all I have to say to one of these gurrils is, 'That's great, dearie, keep it up,' and she'll wurk like the divvil. 'Dearie' fetches them."—*Wall Street Journal*.

Supply Trade News

The Combustion Engineering Corporation, Chicago, announces that six men in its drafting room have joined the colors.

J. M. Betton, maker of injector sand blast apparatus, formerly at 26 Park Place, has removed his office to 59 Pearl St., New York.

W. R. Toppan, who for 15 years was identified with the Kennicott Company, which recently discontinued business, is now manager of the railroad department of the William Graver Tank Works, Chicago, the new proprietor of the Kennicott type "K" water softener.

Joseph Sinkler has resigned as western representative of the Economy Devices Corporation to become special representative in Chicago and tributary territory for the Perolin Railway Service Company.

Mr. Sinkler was born at Scranton, Pa., on December 14, 1874, and began his mechanical career with the Dickson Locomotive Works in the same city. He remained with that company three years and later was employed on the New York, Susquehanna & Western two years and for the succeeding two years on the Delaware, Lackawanna & Western. He became associated with the Franklin Railway Supply Company commencing July 1, 1904, and continued with that company until January 1, 1916, when he was appointed western representative of the Economy Devices Corporation at Chicago. He assumed his duties as special representative of the Perolin Railway Service Company on November 15.



Joseph Sinkler

J. F. Sells, of the engineering staff of the National X-Ray Reflector Company, has been appointed consulting illuminating engineer for the new business departments of the Henry L. Doherty Company, central station. Mr. Sells is located at Mansfield, Ohio, at present.

The Badt-Westburg Electric Company, of Chicago, which handles the Ward Leonard Electric Company's line of electric controlling devices and vitreous enamel insulation resistance units, announces a change in the corporate name to Westburg Engineering Company. This involves no change in management.

Peter H. Murphy, president of the Standard Railway Equipment Company, New Kensington, Pa., died at Pittsburgh, Pa., on November 7. Mr. Murphy was born at Bennington, Vt., on March 16, 1846. He served as machinist apprentice and locomotive engineer on the Erie and was also an engineer on the Pennsylvania Railroad and on the Union Pacific, running the first night express west out of Omaha. He was later division master mechanic on the Baltimore & Ohio at Cumberland, Md., master mechanic of the Toledo, St. Louis & Western and general master mechanic of the Cairo Short Line. He left railroad work in 1888 to engage in the manufacture of car roofs.

TRADE PUBLICATIONS

DU PONT PRODUCTS.—There has just been issued a handy little booklet which contains a list of all the products manufactured by the E. I. du Pont de Nemours and Associated Companies, namely, Du Pont Chemical Works, Du Pont Fabrikoid Company, The Arlington Company, and Harrisons, Inc.

Railway Construction

CHICAGO, BURLINGTON & QUINCY.—This company is developing plans for a new freight terminal to be built on Canal street, between Harrison and Taylor streets, Chicago. A contract has been awarded to the General Wrecking & Lumber Company, Chicago, for the removal of two old freight houses, and a contract for grading has been given to Newman & Co., Chicago. Bids are now being asked on caisson work for the new structure.

The Chicago, Burlington & Quincy is building an addition to its inbound freight house at Omaha, Neb., 60 ft. by 368 ft., which, together with the equipment, will cost about \$60,000. The work is being done by T. S. Leake & Co., Chicago.

CHICAGO & NORTH WESTERN.—This company is building a spur from a point two miles south of Benld, Ill., three miles west to shaft No. 4 of the Superior Coal Company. About two-thirds of the line has been graded and part of the track has been laid.

GOLCONDA NORTHERN.—This company has filed an application with the State Public Utilities Commission of Illinois for a certificate of convenience and necessity to construct and operate a railroad from Golconda, Ill., in a northwesterly direction along the northwest bank of the Ohio river to a point at or near Elizabethtown in Hardin county.

LEHIGH VALLEY.—A contract has been given by this company to George W. Rogers & Co., New York, for building a boiler house at Perth Amboy, N. J. It is to be of brick construction, 40 ft. by 118 ft., and will replace the existing structure.

PACIFIC ELECTRIC.—This company is building car shops, 75 ft. by 220 ft., and one story high, at Torrance, Cal. The building will be a frame structure with concrete foundation and composition roof and will cost about \$10,000. The railroad company's forces are doing the work.

SIoux CITY TERMINAL.—This company is building a bridge across the Floyd river, Sioux City, Iowa, to cost about \$39,000. E. A. Whitney, Sioux City, Iowa, has the contract for the foundation work and Frankman Bros. Bridge & Construction Company has the contracts for fabricating and erecting the steel. The company also contemplates the rearrangement of tracks in the Sioux City stock yards, but has not yet completed plans for this improvement.

PERILS OF RAILROAD BUILDING IN ALASKA.—While the track laying crew was recently engaged in laying rails on the main line near Mile 195 a brown bear came out of the woods and attacked one of the laborers, chasing him down the right of way. Fortunately one of the men had a rifle near at hand and succeeded in killing the animal before any one was injured. The bear weighed about 800 pounds.—*Alaska Railroad Record.*

TRADE BETWEEN THE UNITED STATES AND SOUTH AMERICA is three times as great as in the year before the war. A compilation by The National City Bank of New York shows that the total exports to that continent in the eight months ending with August (the latest month for which figures are available) aggregated \$188,000,000 against \$65,000,000 in the same months of 1914; and the imports from South America were \$433,000,000 against \$157,000,000 in the same months of 1914. Thus the total trade with that continent in the eight months of 1917 was \$620,000,000 against \$222,000,000 in the corresponding months of 1914.

SOUTHERN PACIFIC ADOPTS CORN CAKES.—The extent to which Hoover's plea to save wheat by the substitution of corn is being practiced throughout the country is indicated by the appearance on the tables of all Southern Pacific dining cars of the following printed notice: "The government earnestly desires that wheat be used as sparingly as possible, and that corn be substituted. America was pioneering on corn; the Pilgrim Fathers almost lived on it. Corn was the first crop planted in all the virgin soil as it was settled, from the Atlantic out across the Alleghenies; upon the broad prairie and beyond. On our menu this morning, we have corn-meal cakes." The recipe for the cakes is also given.

Railway Financial News

CHICAGO, BURLINGTON & QUINCY.—At the annual meeting of the stockholders of this road on November 7, O. M. Spencer, general counsel, was elected a director. All retiring directors were re-elected. The date of the annual meeting of the stockholders has been changed from the first Wednesday in November to the first Wednesday in May.

CHICAGO & EASTERN ILLINOIS.—The date of the sale of this road has been postponed from November 7, 1917, to February 5, 1918.

CHICAGO, ROCK ISLAND & PACIFIC RAILROAD.—Justice Scott in the Appellate Division of the Supreme Court of New York has decided that the First National Bank of New York City must pay to Walter C. Noyes, as receiver of the Chicago, Rock Island & Pacific Railroad (one of the two old holding companies), all moneys of that company now on deposit in the bank. It was contended by the bank that as some of the money of the railroad company was deposited with it for specific purposes, such as the payment of interest on bonds maturing at different dates, the bank was holding it as a trustee, and should not turn it over except for the specific purpose for which it was intended. The Appellate Division decided that the naming of different funds was for convenience only, and that it was not in the province of the bank to regulate the use of any funds now lawfully at the disposition of the receiver of the railroad company.

ERIE.—Application has been made to the New York Public Service Commission for authority to issue \$15,000,000 of 6 per cent, series A bonds, under the refunding and improvement mortgage, dated December 1, 1916. The proceeds are to be used in re-imbursement the company's treasury in part for expenditures made from income within the past five years.

GRAND TRUNK WESTERN.—G. W. Dixon, Chicago, has been elected a director to succeed his father, Arthur Dixon, deceased.

KANSAS CITY TERMINAL.—This company has sold \$3,000,000 one-year 6 per cent notes to William A. Read & Co. and Lee, Higginson & Co. of New York, which are being offered at 99¼ to yield 6¼ per cent. The notes are secured by \$4,600,000 first mortgage 4 per cent bonds.

NEW YORK, NEW HAVEN & HARTFORD.—Application has been made to the Massachusetts Public Service Commission for permission to issue 450,000 shares of 7 per cent preferred stock, par \$100, to pay for the road's floating debt of \$45,000,000 now covered by promissory notes, secured by deposit of collateral and maturing April 15, 1918. The issue was recently authorized at a special stockholders' meeting.

PENNSYLVANIA.—See Philadelphia, Baltimore & Washington.

PHILADELPHIA, BALTIMORE & WASHINGTON.—The stockholders at a special meeting on November 7 approved the proposition to lease the company's properties for 599 years, beginning January 1, 1918, to the Pennsylvania Railroad, which owns practically all of the stock. The stockholders also approved the agreement to acquire the properties of the Pomeroy & Newark Railroad. Action on the lease of the Sparrows Point Railway was deferred pending the lease by the Pennsylvania of the Philadelphia, Baltimore & Washington.

YAZOO & MISSISSIPPI VALLEY.—An application has been filed at Memphis, Tenn., for authority to increase its authorized capital stock from \$15,000,000 to \$21,553,300. This company, which operates 1,382 miles of line, is controlled by the Illinois Central. A press despatch from Chicago dated November 9 says that the \$6,553,300 new stock of the Yazoo & Mississippi Valley, for the authority to issue which application has been made, will be substituted for a like amount of Louisville, New Orleans & Texas land grant, non-cumulative 6 per cent income bonds, which issue is owned by the Illinois Central and is pledged as security under the 4 per cent gold bonds of 1953. According to the latest records no interest has ever been paid on the income 6's. The substitution is to be made in order to equalize the funded debt and share capital of the Yazoo & Mississippi Valley.

Railway Officers

Executive, Financial, Legal and Accounting

John Duffy, advertising and publicity agent of the Lehigh Valley at New York, has been elected assistant secretary, with headquarters at New York.

W. S. Jones has been appointed auditor of the Prescott & Northwestern, with headquarters at Prescott, Ark., in place of L. P. Beidelman, assigned to other duties.

C. E. Denney, whose appointment as assistant to the president of the New York, Chicago & St. Louis, was announced in these columns on November 2, was born at Washington, D. C., on October 18, 1879. He attended the Pennsylvania State College from 1896 to 1899, leaving school that year to become an inspector for the Union Switch and Signal Company, with which company he remained until May 16, 1905, when he resigned the position of superintendent of construction to become assistant signal engineer on the Lake Shore & Michigan Southern. One year later, May 16, 1906, he was promoted to signal engineer and six years later his jurisdiction was extended over the Lake Erie & Western. On October 15, 1913, he was promoted to the position of special engineer in the office of J. J. Bernet, vice-president of the Lake Shore, which position he held until August 15, 1914, when he resigned to return to the Union Switch and Signal Company. His service with that company as assistant general sales manager, assistant general manager and assistant to the president, in the order named, was continuous from August 15, 1914, to November 15, 1916, on which date he was appointed special engineer to the president of the Nickel Plate. On November 1, 1917, he was appointed assistant to the president with headquarters at Cleveland.



C. E. Denney

W. G. Choate, superintendent of the Louisiana division of the Gulf Coast Lines at De Quincy, La., has been appointed assistant to the president, with office at Houston, Texas.

B. B. Greer, vice-president and general manager of the Colorado & Southern, has been elected also president of the Colorado Springs & Cripple Creek, with office at Denver, Colo.

W. E. Morse, having resigned the position of general manager for the receivers of the Denver & Salt Lake, the duties of that office have been assumed by W. R. Freeman, receiver. The offices of treasurer and assistant treasurer for the receivers have been abolished.

W. T. Tyler, vice-president of the St. Louis Southwestern of Texas, Tyler, Tex., has been appointed assistant to the first vice-president of the Northern Pacific, with headquarters at St. Paul, Minn., succeeding T. H. Lantry, who has been named a member of the Russian Railway Service Corps.

B. Newhouse, auditor of traffic accounts of the Minneapolis, St. Paul & Sault Sainte Marie at Minneapolis, Minn., has been appointed assistant comptroller, vice A. R. Marshall resigned, and R. A. Mueller has been appointed freight auditor. The position of auditor of traffic accounts has been abolished.

J. J. Turner, president of the Chicago Union Station Company and the Indianapolis Union, and vice-president of the Monon-

gahela Railway and the Pennsylvania Lines West, has been elected president of the Grand Rapids & Indiana, with headquarters at Pittsburgh, Pa., vice J. H. P. Hughart, deceased.

W. H. King, Jr., has been appointed president's assistant of the Seaboard Air Line, with headquarters at Norfolk, Va., vice E. C. Bagwell promoted, effective November 10. Mr. King succeeds Mr. Bagwell also as general manager of the Tampa Northern, the Raleigh & Charleston and the Chesterfield & Lancaster.

W. N. Neff, superintendent of the Northwestern Pacific, at Sausalito, Cal., was appointed vice-president and general manager of the St. Louis Southwestern of Texas, and general manager of the St. Louis Southwestern at Tyler, Tex., effective November 8, succeeding James Russell, resigned to become vice-president of the Denver & Rio Grande, Denver, Colo.

Robert McIntyre, whose appointment as assistant to vice-president and general manager of the Southern Pacific Company, Pacific System, was announced in the *Railway Age Gazette* of October 19, was born at Kouchibouguac, Kent county, N. B., and entered railway service on February 1, 1886, as brakeman on the Intercolonial at Moncton, N. B. He was subsequently until May, 1890, switchman on that road, and from June, 1890, to September, 1892, was employed as a switchman on the Old Colony at Boston, Mass. The following seven months he was with the Galveston, Harrisburg & San Antonio as switchman at El Paso, Tex., and from May, 1893, to March, 1900, was employed by the New York, New Haven & Hartford in a similar capacity at Boston. He then went to the Southern Pacific and until September, 1907, was successively brakeman and conductor on the Tucson division. From the latter date to July, 1909, he was salary chairman of the committee of the Brotherhood of Railroad Trainmen on the Southern Pacific, Pacific System. He was later made vice-president of the grand lodge of the Brotherhood of Railroad Trainmen, which position he held until his recent appointment, as noted above.



R. McIntyre

Operating

F. A. Winterson has been appointed assistant superintendent of the Laurentian division of the Canadian Pacific, with office at Montreal, Que., vice V. A. Harshaw, transferred.

A. W. McKay was appointed assistant superintendent of telegraph of the Great Northern, effective November 1, with headquarters at St. Paul, Minn., succeeding J. H. McGlogan, granted leave of absence.

W. H. Romoser, assistant superintendent of the Gulf Coast Lines at Kingsville, Texas, has been appointed superintendent of the Louisiana division, with office at DeQuincy, La., succeeding W. G. Choate, transferred.

W. C. Ascherast has been appointed trainmaster of the First Medicine Lodge and Kiowa districts, Panhandle division, Atchison, Topeka & Santa Fe, effective November 1, and will have headquarters at Wellington, Kan.

R. M. Leech, superintendent of transportation of the International Railways of Central America at Guatemala City, Guatemala, has been appointed general superintendent in charge of operation and maintenance in Guatemala.

H. McCall, superintendent of the Grand Trunk Pacific at Melville, Sask., has been appointed general superintendent rail lines west of, but not including Edmonton, Alta., with office at Prince Rupert, B. C., vice W. C. C. Mehan, granted leave of absence.

Andrew Keiser, superintendent of the Conemaugh Division of the Pennsylvania Railroad at Pittsburgh, Pa., has been granted a leave of absence, and during such absence the duties of the position will be performed by F. W. Smith, Jr., as acting superintendent; and A. B. Cuthbert, principal assistant engineer, Eastern Pennsylvania division, has been appointed acting superintendent of the Cresson division, with headquarters at Cresson, vice Mr. Smith.

F. E. Blaser, general superintendent of the Baltimore & Ohio at Baltimore, Md., has been promoted to assistant general manager; M. H. Cahill, general superintendent at Pittsburgh, has been transferred to Baltimore, succeeding Mr. Blaser; J. F. Keegan, general superintendent at Wheeling, W. Va., has been transferred to Pittsburgh, succeeding Mr. Cahill; J. M. Scott, superintendent at Grafton, W. Va., has been promoted to general superintendent, with office at Wheeling, and J. W. Deneen, assistant superintendent of the Coal & Coke Railway at Gassaway, has been appointed superintendent of the Baltimore & Ohio, at Grafton, succeeding Mr. Scott; effective November 1.

John Richard Savage, who has been appointed general manager of the Long Island Railroad, with headquarters at New York, as has already been announced in these columns, was born

on April 17, 1869, at Philadelphia, Pa. He graduated from the University of Pennsylvania in 1889, receiving the degrees of bachelor of science and civil engineer. In May, 1899, he entered the service of the Pennsylvania Railroad as a rodman and leveler, where he remained until October, 1890, when he resigned to become transitman with the United States engineering corps at Portland, Ore., and later served as assistant engineer in the United States engineering corps. In May, 1895, he was appointed engineer of the Seattle & Lake



J. R. Savage

Washington Company and from October, 1897, to October, 1900, served as assistant engineer on the Pennsylvania Railroad. He was then to July, 1901, engaged in making surveys for a proposed railroad through Lebanon valley, from Cornwall to Highspire. In August, 1901, he entered the service of the Lackawanna Iron & Steel Company, later known as the Lackawanna Steel Company, as assistant to the general manager, and was with that company during the construction of a new plant at Buffalo, N. Y. In April, 1904, he was appointed chief engineer of the Long Island Railroad and was recently appointed general manager of the same road, as above noted.

G. A. Hoag, assistant superintendent of the Canadian Northern at Trenton, Ont., has been appointed superintendent of the Superior district, including Nipigon, Long Lake and Oba subdivisions, with headquarters at Hornepayne, Ont.; W. R. Kelly is superintendent of the Nipissing district which now consists of the Ruel, Sudbury, North Bay and Pembroke subdivisions, including Foley, Sudbury and Parry Sound terminals, with headquarters at Capreol; George Collins has been appointed superintendent of the Quinte district which now consists of the Picton, Maynooth, Irondale, Tweed, Kingston and Brockville subdivisions, including Trenton terminals, with headquarters at Trenton, Ont.

The Seaboard Air Line announces that the operating organization was changed on November 10, as follows: The Virginia, North Carolina and Georgia divisions will constitute the Northern district, and the South Carolina, East Carolina, Alabama and Florida divisions will constitute the Southern district. R. S. Marshall, superintendent of the Virginia division at Raleigh, N. C., has been appointed general superintendent of the Northern district with headquarters at Hamlet, N. C.; H. B. Grimshaw,

general superintendent at Savannah, Ga., has been appointed general superintendent of the Southern district with headquarters at Savannah; O. R. Teague, superintendent of the Florida division at Tampa, Fla., has been appointed superintendent of the Virginia division, with headquarters at Raleigh, N. C., vice Mr. Marshall; D. N. Bacot, superintendent of the East Carolina division at Charleston, S. C., has been appointed superintendent of the Florida division, with headquarters at Tampa, Fla., vice Mr. Teague, and E. C. Bagwell, president's assistant at Norfolk, Va., has been appointed superintendent of the East Carolina division, with headquarters at Charleston, vice Mr. Bacot.

Traffic

H. L. Fell has been appointed assistant general passenger agent of the Central of Georgia, with office at Savannah, Ga.

C. Price-Green has been appointed industrial commissioner of the Canadian Northern, with headquarters at Toronto, Ont.

A. L. Ellet, assistant general passenger agent of the Chesapeake & Ohio, at Cincinnati, Ohio, has been transferred to Lexington, Ky., as southern passenger agent.

F. R. Stevens, agriculturist of the Lehigh Valley at Geneva, N. Y., has resigned to become agricultural secretary of the Pennsylvania State Chamber of Commerce.

Patrick Portel has been promoted to assistant general freight agent of the Chicago, Rock Island & Pacific, with headquarters at Oklahoma City, Okla., effective November 1.

T. H. Gurney, district passenger agent of the Chesapeake & Ohio, at Chicago, has been appointed assistant general passenger agent of the same road with headquarters at Cincinnati, Ohio.

P. L. Howard has been appointed commercial agent of the Missouri, Kansas & Texas at Tulsa, Okla., succeeding O. C. Thomas, resigned to engage in other business, effective November 1.

W. G. Knittle, traveling passenger agent of the New York Central, with headquarters at Youngstown, Ohio, has been promoted to general agent of the passenger department with the same headquarters.

W. H. Timberlake, commercial agent of the Southern at Cincinnati, Ohio, has been transferred to Minneapolis, Minn., in the same capacity. G. W. Benus, district freight agent, Cincinnati, will assume Mr. Timberlake's duties there.

W. J. Tremaine, commercial agent of the Alabama & Vicksburg and the Vicksburg, Shreveport & Pacific at Chicago, has been appointed assistant general freight agent, with office at Shreveport, La., and H. E. Freund succeeds Mr. Tremaine.

H. A. Jackson, general traffic manager of the Great Northern Pacific Steamship Company, San Francisco, Cal., has been appointed to the newly created position of export and import agent of the Great Northern, with headquarters at Seattle, Wash.

L. L. Fellows has been appointed general agent, freight department, of the Lake Erie & Western, the Ft. Wayne, Cincinnati & Louisville and the Northern Ohio, with office at Indianapolis, Ind., and the office of commercial agent at that point has been abolished.

Charles S. Cairns, general passenger and ticket agent of the Chicago & North Western, at Chicago, has been promoted to passenger traffic manager, and John L. Ferguson, assistant general passenger agent at Chicago, succeeds Mr. Cairns as general passenger and ticket agent, both with headquarters at Chicago; effective November 15.

E. B. Wilkerson has been appointed general agent, freight department, of the Missouri Pacific, with headquarters at Wichita, Kan., succeeding S. H. Kilgore, transferred. W. C. Dibblee has been appointed general agent, passenger and freight department, with headquarters at Seattle, Wash., succeeding W. S. Mitchel, transferred.

Alan W. Graves, traveling freight agent of the Merchants & Miners Transportation Company at Baltimore, Md., has been appointed commercial agent of the Merchants & Miners Transportation Company and the Central of Georgia (Central Savannah

Line), with headquarters at Baltimore, vice S. A. Tubman, furloughed to enter military service.

E. C. Meyer, commercial agent of the Chicago & Alton, at Birmingham, Ala., has been promoted to general agent, traffic department, with headquarters at Milwaukee, Wis., succeeding W. C. Mueller, resigned. H. A. Dowling, contracting freight agent, St. Louis, Mo., has been appointed commercial agent, Birmingham, succeeding Mr. Meyer; effective November 6.

Engineering and Rolling Stock

J. W. Coulter has been appointed master mechanic of the Alton & Southern, with headquarters at East St. Louis, Ill.

H. H. Temple has been appointed chief engineer of Pittsburgh & West Virginia and the West Side Belt, with headquarters at Pittsburgh, Pa.

J. A. Heaman, assistant to chief engineer of the Grand Trunk Pacific at Winnipeg, Man., has been appointed assistant chief engineer, and the position of assistant to chief engineer has been abolished.

E. C. Wright, district bridge inspector, Maryland district of the Baltimore & Ohio, has been promoted to division engineer, with office at Wheeling, W. Va., succeeding P. A. Beatty, resigned; effective November 1.

M. Turton has been promoted to mechanical superintendent of the International Railways of Central America, with office at Guatemala City, Guatemala, in place of R. Potts, who has resigned to go to another railroad company.

W. R. Harrison has been appointed master mechanic of the southern Arkansas division of the Atchison, Topeka & Santa Fe, with headquarters at Chanute, Kan., succeeding W. H. Hamilton, assigned to other duties, effective November 10.

L. L. Sparrow, engineer of roadway of the Atlantic Coast Line at Jacksonville, Fla., has been appointed office engineer, with office at Wilmington, N. C., and H. G. Laird, superintendent of timber preservation at Gainesville, Fla., succeeds Mr. Laird.

George H. Brown, division engineer of the Philadelphia division of the Pennsylvania Railroad at Harrisburg, Pa., has been appointed acting principal assistant engineer of the eastern Pennsylvania division, vice A. B. Cuthbert. (See Operating Officers.)

S. F. Shaw has been appointed chief engineer of the International Railways of Central America, with office at Guatemala City, Guatemala, in charge of engineering, additions and betterments and right-of-way in Guatemala, succeeding E. H. Stewart, resigned to go to another company. C. R. Chandler, assistant engineer at Guatemala City, has been appointed engineer of maintenance of way in Guatemala.

Charles Manley, whose appointment as superintendent of machinery of the Missouri & North Arkansas, with headquarters at Harrison, Ark., was announced in the *Railway Age Gazette* of October 19, was born on September 10, 1867, at Nashville, Tenn. He began railway work on May 1, 1883, with the Texas & Pacific at Big Springs, Tex., and after serving an apprenticeship of four years as machinist with that road, he was employed as machinist by various railroads in the Southwest and West, including the Mexican National, with which he was identified until May, 1910. While with the latter road he was employed successively as general foreman at Laredo, master mechanic at Mexico City, and superintendent of shops at Aguas Calientes. He left Mexico on account of the revolution, but returned in December, 1910, as master mechanic of the Vera Cruz Terminal Company at Vera Cruz, Mex. Subsequently he became superintendent of motive power of the Tehuantepec National. On August 1, 1912, he went to the Missouri & North Arkansas as terminal foreman, one month later he was promoted to master mechanic, and on July 1, 1916, was appointed superintendent at Harrison, Ark., which position he held until his recent appointment as superintendent of machinery.

Railway Officers in Military Service

Clyde E. Barnes, mechanical engineer of the Spokane, Portland & Seattle, has enlisted in the navy. He will take the Harvard or Columbia four-months' course in electrical or mechanical instruction for motor boat submarine chasing, after which he will be rated as a machinist's mate in the navy.

OBITUARY

W. R. Sykes

W. R. Sykes, inventor of the controlled manual system of block signaling is dead, in England, at the age of 78. He entered railway service on the London, Chatham & Dover in 1863 and continued to serve in the signal department until 1899, when that road was combined with the South Eastern; but he continued with the combined companies as consulting electrical engineer, and therefore had been continuously in the same service for 54 years.

Mr. Sykes began in the shops of the telegraph department, and, indeed, had worked for a telegraph company before coming to the railway; and in a very short time he made an improvement on the needle telegraphs which were used for manual block signaling. In 1872 he installed some electric signals in the Victoria station of the Metropolitan District Railway, London. He tried a track circuit as early as 1864, but the experiment seems not to have been followed up. The first controlled-manual apparatus was tried in 1874 and was patented in 1875. He called the scheme "a combined lock and block" and lock-and-block has continued to be the name by which the system is known in England. This invention was a truly fundamental innovation, for the control of the entering signal by the man at the outgoing end of the block section (and by the outgoing train) made a radical improvement in safety, though Tyer's single-track apparatus, which embodied the same electrical principle, was, we believe, of earlier date than Sykes' system.

Mr. Sykes installed what might be called an electro-mechanical system of interlocking at the Victoria station in 1883 where 50 signals were used, interlocked in some way with the mechanical interlocking. These appear to have been constructed on the same general principle as the enclosed disk signals which were then coming into use in this country.

Sykes was the author of numerous other inventions and improvement and his talents seem to have been availed of far beyond the limits of the London, Chatham & Dover. The lock-and-block system was soon introduced on the South Eastern, the London, Brighton & South Coast, the Great Eastern and the London & South Western.

The Sykes apparatus was introduced into the United States by the Union Switch & Signal Company. It was first used on the Harlem division of the New York Central, between Grand Central Terminal, Forty-second street, New York, and Woodlawn, in 1882, or 1883, about seven miles being completed in that year. The engineers of the Union Company made important modifications in the system and it was extended, about 1892, over the main line of the New York Central from New York to Buffalo, 440 miles, and it was installed extensively on the New York, New Haven & Hartford. On the Erie it was used on one division. J. P. Coleman, engineer of the Union Company devised many of the changes and improvements in the apparatus and in certain installations it was called the Coleman system.

Today, as everyone knows, the automatic block signal system is superseding the manual on busy lines all over the country and the controlled manual has gradually been displaced. The New York Central, by the last statistical report, had only 39 miles. The New Haven road had 175 miles. These installations are being slowly taken out, so that soon there will be none. In this connection it is to be noted that in England, where manual signaling still prevails, the primary principle of control of the entering end of a block section by the man at the outgoing end, has found increased favor within the last 10 years even on roads where Sykes did not find favor. And the root principle, it may be said, has been used on a considerable mileage in this country, on single track lines; but without the elaborate safeguards employed by Sykes and Coleman.

Personally, Mr. Sykes was of a very retiring disposition, and never took part in public discussions. A daughter of his is the wife of Arthur H. Johnson, at one time signal engineer of the Erie Railroad and now superintendent of telegraph and signals on the London & South Western; and a son, George Sykes, worked for the Johnson Railroad Signal Company at Rahway, N. J., for a few years in the early nineties.

NO SWISS SUNDAY TRAINS.—A Central News telegram from Zurich says that after October 15 no more passenger trains are to be run on Sundays in Switzerland.

Railway Age Gazette

Volume 63

November 23, 1917

No. 21

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As we go to press it seems to be generally expected that important if not decisive developments affecting the latest

A Big Job for President Wilson

demands of the railway train employees for higher wages will result from the conference between the brotherhood leaders and President Wilson to be held on Thursday of this week. Naturally there is considerable anxiety as to whether the President will be able to point the way to an adequate solution of the problem. The Railroads' War Board, while expressing a belief in the principle of arbitration, in view of the situation created by the war, has waived insistence on this method of settlement, and has agreed to place the interests of the railroads unreservedly in the hands of the President. The brotherhood chiefs are still unwilling to submit their demands to arbitration, but have agreed to mediation and that they will take no precipitate action until after hearing from the President. While no one apparently has any doubt that a settlement of some kind will be reached sooner or later, for a strike at this time would be unthinkable, the important question is as to what kind of a settlement can be reached. Manifestly the railroads cannot assume the added burden which this further increase in their payroll would involve without knowing where the money is coming from and without considering the great majority of their employees who do not belong to the brotherhoods. They have, therefore, gone about as far as could possibly be expected of them in placing themselves in the hands of the President, and their action should receive public recognition as being dictated by the most patriotic motives. If the President can devise a plan by which justice can be served without a surrender to the exigencies of the emergency, his action will merit the highest commendation, but the responsibility upon him is a heavy one.

The traffic commissioner of a Board of Trade or other merchants' organization has to spend a large part of his time and energy in getting justice from the railroads in behalf of complaining shippers; but sometimes shippers' grievances are not well founded and this traffic commissioner finds it his duty not to get justice, not to be an advocate, but to dispense justice, much as a judge or an arbitrator would do.

The National Industrial Traffic League

He stands between a large body of constituents and a smaller body of railroad officers. If any one thinks that these commissioners are partisans, always driving or fighting the railroads, he should attend a meeting of the National Industrial Traffic League, like that reported in another column of this issue. The high-minded, judicial, fair-dealing attitude of all of the principal participants in the discussions at this convention was constantly in evidence. Some of these men were formerly in railroad service, and they know all the weaknesses or wrongs or wickednesses that may be found in the railroads' practices; but the ex-railroader who, to please his new employer, is unreasonable or vindictive toward the carriers was conspicuous at this meeting by his absence. There was a time, years ago—we will not say how few years ago—when the Interstate Commerce Commission thought more of getting justice—from the railroads—than about placing itself in a strictly impartial attitude. If any member of that body feels in his breast a fear that this old spirit still persists, he could take lessons from some of these shippers' representatives. And there are railway traffic officers who could go to the same source for a number of lessons. Our suggestion of three weeks ago, that railway officers should perfect themselves in the art of presenting their ideas, might be amplified into an admonition also to study more assiduously the art of thinking straight. The most strenuous advocate often makes his strongest point when he makes clear to all observers that he has fairly considered both sides of his question.

The *Railway Age Gazette* recently referred to the fact that while railway gross earnings are the largest in history, net earnings are declining, and added: "These facts explain clearly why the stocks of some of our best railroads are selling at prices less than when the exchanges closed in July, 1914." The Topeka (Kans.) Capital, referring to this statement, says, "Half-truths always come from organs." The Topeka Capital is the organ of a clever politician, who owns it; who got himself elected governor of Kansas largely by the dissemination through it of half-truths about railroads; and who is now trying to get himself elected United States Senator by similar means. It is therefore an expert on organs and half-truths. The *Railway Age Gazette* is not consciously an or-

Half Truths and Whole Truths

gan of the railways, as the Capital implies. But suppose it is. With organs of politicians, such as the Capital, constantly telling half-truths about railways, why shouldn't the *Railway Age Gazette* be allowed to tell the other half, so that the whole may be known? However, in this case the Capital did not tell its half of the truth. It said: "There has been a corresponding shrinkage of all securities on all stock exchanges in the last six weeks." John Skelton Williams, comptroller of the currency, who is a much better expert on this subject than the Capital, issued a statement on November 5, in which he stated that the securities of the railroads "had sustained the heaviest shrinkages" and "had been the leaders in the downward movement of values." It is one of the duties of the comptroller of the currency to determine the basis of value on which national banks may carry securities as investments. When, therefore, the Topeka Capital says that "there has been a corresponding shrinkage of all the securities" and the comptroller of the currency says that railroad securities have sustained the heaviest shrinkage and have been the leaders in the downward movement of values, the public is more likely to accept the view of the comptroller. Why have railroad securities led in the decline? The comptroller of the currency also implies the answer to that question: "If a way cannot be found now to reduce the prices of materials and the cost of labor to a normal basis, and this for the present is hopeless, it seems clear on the facts before us that a revision and modification of the fabric of rates to meet these new conditions has become imperative." The plain implication of this is that railway securities have led the decline because railway expenses have increased so much as to impair the earning capacity of the roads.

FEDERAL INCORPORATION OF ALL RAILROADS

THE address made by S. Davies Warfield, president of the Continental Trust Company of Baltimore, before the Investment Bankers' Association convention, is crowded with material for sensational headlines, but nevertheless it deserves careful study rather than superficial display. After much study and consideration the Railway Executives Advisory Committee adopted the opinion that an act of Congress making compulsory federal incorporation of interstate railroads was one of the necessary steps in bringing order out of the present chaotic condition of railroad regulation. Stripped of its fireworks, Mr. Warfield's contention is that such an act of Congress would probably be unconstitutional and certainly would leave railroad credit in the most dangerous condition until its constitutionality had been passed upon by the Supreme Court; that it would make government ownership far easier of accomplishment and therefore more likely; that by shortening the present long drawn out and complicated process of appeal from inferior courts to higher courts, to still higher courts, and so on to the Supreme Court, the railroads would be depriving themselves of some safeguards which they now have; and finally that such an act would deprive states of their states' rights.

It is natural that Mr. Warfield should regard any step toward more centralized control of railroads as a possible invasion of states' rights. Loyal to the South, it is natural that Mr. Warfield should view political questions from a state's rights point of view. This quite possibly accounts for the brilliant coloring with which the dangers in the proposed act to provide for federal incorporation of railroads are painted. To the majority of those—railroad men, bankers, economists and statesmen—who are now struggling with the problems of railroad regulation, the sacredness of states' rights probably does not bulk as large as it does to Mr. Warfield. Considering the question of federal incorporation, therefore, simply on its merits as an expedient or in-

expedient measure for bringing order into the present hit and miss, haphazard and contradictory regulation of railroads by the Interstate Commerce Commission, state commissions and state legislatures, we must study critically the points which Mr. Warfield makes.

As to whether or not the act would be unconstitutional, only the Supreme Court can decide. Eminent lawyers would undoubtedly be of divided opinion. Mr. Warfield does not name the two legal authorities he quotes against federal incorporation; but it is pretty safe to assume that an eminent lawyer holding the views that Samuel Untermyer, for instance, holds might be prepared to argue that such an act would be unconstitutional. On the other hand, the Railway Executives Advisory Committee not only had the advice of its eminent counsel, Mr. Thom, but of many other distinguished lawyers. If, therefore, there is good reason to believe that the act might be held constitutional, it should, if it has merits, be placed before the Supreme Court for its ruling. It is probable that the Supreme Court would pass upon a question such as this very promptly. The interregnum period would therefore be quite short and as a matter of fact there would be very little more uncertainty in railroad security markets with the act passed and awaiting the Supreme Court's decision than there is right now, especially if other provisions of the proposed act cleared up other phases of this many sided question of railroad regulation.

It sounds rather startling to say that by procuring the exactment of a federal incorporation law the railroads would collectively be putting their various heads into a single noose for the convenience of the hangman of government ownership. If anyone will carefully study the acts of Congress and the President since the declaration of war by the United States and will use sound common sense in analyzing these acts as reflecting the attitude of the government and of the people, he will be pretty surely forced to the conclusion that if the people or the government really decide that government ownership is desirable, government ownership we will have in short order. The various little legal difficulties which would stand in the way because of the possession by the railroads of state granted charters would be brushed aside, as so many other apparent obstacles have been brushed aside since the beginning of the war, and the only thing that could really prevent government ownership would be a decision of the Supreme Court holding it unconstitutional. Is it not just a bit fanciful to say that government ownership would be constitutional if it were preceded by an act compelling federal incorporation, when that act itself would have been passed upon by the Supreme Court, but that if no such act had been passed the Supreme Court would hold government ownership unconstitutional?

As to taking away some of the advantages which a railroad now has in being able to raise one legal difficulty after another—to the railroad whose cause is just, such disposal of red tape would be a good clearance of useless rubbish and to the company whose cause is unjust, the deprivation of its present advantages will be for the good of the community as a whole.

There remains, then, the question of states' rights. The country happily is fast getting away from the old states' rights theories. The safety appliance act, the control of car distribution by the Interstate Commerce Commission, the child labor law, the Clayton bill, the income tax act, the valuation act, the white slave act, the national mediation and arbitration act, all vest in the federal government powers which under the old states' rights theories belong to the states exclusively. The Supreme Court has passed on nearly all of the acts such as those mentioned above. With the nation at war it is certainly inopportune to hark back to states' rights theories. Even before the supreme necessity for a compactly united nation to face the enemy had arisen,

the trend of legislation and the decisions of the Supreme Court had demonstrated that states' rights was an obsolete issue. The right of a state is to be protected against other states. Some states must not be permitted to burden all of the others.

THE RAILWAY WAR PROBLEM, AND ITS SOLUTION

IT was a highly significant piece of news which the Railroads' War Board gave to the public last week when it stated that it had handed to Judge Lovett, the government priority director, and Dr. Garfield, the government fuel administrator, a list of 525 commodities which were deemed sufficiently "non-essential" to be denied fuel for their manufacture and transportation for their movement in case need for such action should arise. The Railroads' War Board stated very precisely what its action was, and what it meant, but many of the reports regarding it have been inaccurate. For example, it has been said that the railways have "recommended" or even "demanded" that the articles in question be excluded from transportation.

This is incorrect. The truth is this: The course of developments has forced Judge Lovett and Dr. Garfield, representing the government, and the Railroads' War Board, representing the railways, to a recognition of the fact that it may, and probably will, become impossible for the coal mines to produce enough coal, and the railways to produce enough transportation, to furnish in this time of war fuel and transportation to all the industries to which they are furnished in time of peace. Since the railways have in the offices of their freight classification committees the most complete records in existence of all the commodities now being produced and transported in this country, the Railroads' War Board was asked to have prepared a list of commodities which, under war conditions, might be regarded as "non-essential." This work was assigned to the chairman of the Official (eastern), the Southern and the Western Classification committees, and the list in question was compiled by them. The railways do not even "recommend," much less "demand" that all or any of the producers and shippers of the commodities in question shall be denied fuel or transportation. It was their function to furnish the information for which they were asked, and they have performed that function. Any action which may be taken, based upon this information, will be a war measure; and it is strictly the function of the government to adopt war measures and to assume full responsibility for them. Until the government acts, the railways will continue to try to furnish transportation, and presumably the mine operators will continue to try to furnish fuel, to all classes of industries.

* * *

Meantime, however, the fact that there has been prepared a list of commodities to which it *may* be necessary to deny transportation is one of great moment. Just about eleven years ago James J. Hill wrote to Governor Johnson of Minnesota a famous letter in which he predicted that if the restrictive and destructive policy of regulation of railways then being generally adopted by the national and state governments were persisted in, the development of the facilities of the railways would be so arrested that they would become inadequate to the demands of the nation's commerce. The warning Mr. Hill then voiced has been repeated every day since by persons in close contact with the railway industry. But the policy they have deprecated has been continued and intensified. Meantime, the railway managers year after year, and especially within recent months, have performed prodigies in increasing the efficiency of the existing facilities.

The most striking illustration, perhaps, is afforded by the extent to which they have increased the amount of freight

traffic they have handled without any corresponding increase in train service. The Railroads' War Board has pointed out that in the five months from April to August, inclusive, the railways moved as much freight as they did in any entire year prior to 1904. The record of achievement is worth giving in more detail. In 1903—the largest year before 1904—the railways produced 173 billion ton-miles of freight transportation and did it by operating freight trains a total of 526 million miles. In the five months of this year ending with August the Class I roads alone produced 172 billion ton-miles of freight transportation by running freight trains a total of only 276 million miles. Of course, the saving in train-miles and the increased efficiency indicated were accomplished by almost doubling the average load of a freight train.

The railways are today handling twice as much freight as they were when Mr. Hill wrote his letter to Governor Johnson, and doing so with only about the same number of freight trains. In spite, however, of this tremendous increase in the amount of freight being moved, there are serious delays and congestions, and it is admitted that the time may soon arrive when it will become impossible to move some kinds of freight at all. And in spite of the increases of efficiency which have been achieved the railway managers are again before the Interstate Commerce Commission declaring that the net return of the railways has been and still is being so reduced that it has been impracticable, and is rapidly growing impossible, for most of them to make any substantial increases in their facilities, or even to maintain in good operating condition the existing facilities.

* * *

This general situation seems very puzzling to some people and entirely hopeless to others.

The former class can't understand why the railways, with the largest earnings and the most efficient operation ever known, are not making more money than they ever did and are not in a good position to increase their facilities and the amount of traffic they can handle.

The latter class can see no way out of the transportation muddle except some form of direct government assistance to the roads or government ownership.

We shall address ourselves to two phases of this general subject. First, have the railways reached or are they closely approaching the limit of their capacity with their present facilities? Second, if they have reached or are approaching their limit, what measures should be adopted by their managements, or by the government, or by both, to restrict the traffic piled upon them or to enable them to increase their facilities?

We have it upon the highest railway authority, that of the Railroads' War Board itself, that the railways as a whole have not reached the limit of the capacity of their present facilities, or the War Board, in the statement issued by it last week, which is published elsewhere in this issue, expressed this opinion. That opinion can be amply supported by evidence. The railways, as a whole, are still increasing the amount of traffic they are handling; and nobody can compare the statistics of car capacity with those of the tons actually being hauled per loaded car, or the statistics of locomotive tractive power with those of the tons being hauled per train, or the comparative statistics of different roads, showing, as they do, that some roads are handling much more business per mile of track and per mile of line than other roads under comparable conditions, without concluding that it is *possible* to handle a much greater traffic with existing facilities. But what is *possible* and what is *practicable* are commonly two very different things; and this is obviously the case as respects the matter under consideration. Doubtless it would have been *possible* to have handled freight in as large carloads two years ago as it is being

handled in now; but only a fool or an ignoramus would contend that it would have been *practicable*. Now, all the evidence indicates that, *under existing conditions* the railways are approaching the limit of what it is *practicable* for them to do.

The latest monthly statistics available regarding freight business handled are those for August. The number of unfilled orders placed by shippers for freight cars increased in that month, showing that the demand for freight transportation was still increasing. But the railways apparently handled little or no more freight than they did last June. The increase as compared with August, 1916, was only 8.4 per cent, which was the smallest increase over the corresponding month of 1916 recorded since this country entered the war. There are good reasons for believing that when complete statistics for the fall months are available they will show continued increases in the business handled, but nowhere near as large increases as those recorded from April to July. But the number of unfilled orders from shippers for cars had increased on November 1 to 140,000. The conclusion is obvious. The increases in traffic are again occurring faster than the increases in transportation efficiency. Under present conditions that means that the excess of the demand for transportation over the supply of it is growing.

When, on the entrance of the United States into the Great War, the same general condition existed, the managements of the railways, under government sanction, and entirely regardless of the Sherman Anti-trust law, took heroic action. They resolved to operate the railways as a single continental system, and created the Railroads' War Board to carry out the resolution. Marvels have been accomplished as a result of that action. *But experience has demonstrated that the resolution then adopted cannot be fully carried out; and the inability of the railways fully to carry it out is the main reason why the maximum possible amount of transportation cannot be provided with existing facilities.*

Why are the railways unable fully to carry out their resolution? Because the Sherman anti-trust law, the anti-pooling section of the Act to Regulate Commerce, the provision of the Act to Regulate Commerce empowering the shipper to route his freight any way he pleases, and various other existing laws—and also the want of some important laws—thwart at every turn those responsible for the operation of the railways.

* * *

It is agreed by the Interstate Commerce Commission and the Railroads' War Board that one of the main things needed to secure the greatest transportation efficiency under existing conditions is to route freight traffic over the lines of least resistance—in other words over those which are least congested. But how, under existing laws, is this to be accomplished? There are many parts of the country in which it would be beneficial for the Railroads' War Board, in the interest of the highest transportation efficiency, to order all the competing lines to pool their freight traffic, agreeing among themselves on some basis for the division of earnings. The result of the general pooling of freight traffic would be a large increase in the capacity of existing railway facilities. But any such action is entirely out of the question as long as federal laws both absolutely prohibit pooling of either freight traffic or earnings and in addition give every shipper absolute power to route his own freight. In other words, under existing law, the railways can pool and are pooling their equipment, but they cannot pool their trackage and other facilities, which would be far more important.

Again, a large further increase in efficiency could be secured by general increases in minimum carload weights and by reductions of delays to cars while in the hands of shippers. There are many thousands of shippers in the country

who have energetically and patriotically responded to the appeals of the railways for heavier loading and prompter loading and unloading of cars as means of winning the war. The railways have so cordially appreciated the way many shippers have co-operated with them that they have desisted from all efforts to get minimum weights increased. But the fact is, that while thousands of shippers are doing their duty in this matter, other thousands are not doing it, and that, largely owing to this condition, many classes of shippers are in danger of being denied transportation entirely. Is it not time for the railways and the regulating authorities to recognize the fact that the only people who will be hit by increased minimum weights are those who are not loading cars as the conditions demand, and that it is better that they should be forced to do their duty rather than that the entire nation, including shippers who are doing their full duty, should suffer? It seems very hard for many people to recognize the fact that this nation is engaged in a terrible war and that all of our commercial, industrial and transportation methods must be altered to meet the conditions created by war, or we shall be overwhelmed by a terrible disaster.

There is evident, also, a need for a new dedication of railway officers and employees to the great task to which they have set themselves. The organization of the Railroads' War Board last spring caused for a while a wonderful increase in the energy and the enthusiasm with which all classes of railway men did their work. It was largely this which produced the great results achieved for some months. While railway men may be working just as hard as ever, they are not working with the same enthusiasm and initiative that they were a few months ago. The cynical, cold-blooded and ignorant way in which their efforts and their problems have been regarded and dealt with by most of the regulating authorities, is largely responsible for this. But railway men have a high duty to perform in this war; and they ought to go on performing it with all the enthusiasm, energy and ability of which they are capable. That is the patriotic thing to do, and that in the long run will prove to be the most effective means of winning popular approval and support. There still remains much that railway officers and employees can do to increase the amount of traffic that can be handled if they will but renew, with a new baptism of energy and courage and optimism, their dedication to their country of the best service they have in them.

The most effective thing that could be done at this time to increase the capacity of the railways would be to repeal every law which interferes with their efforts to operate as a single national transportation system. If that were done the Interstate Commerce Commission would have plenty of power, under already existing laws, to control their rates and service in the public interest. If in addition to this, all those who are concerned with the operation of the railways and all those who use their facilities, would do all that they may reasonably be asked to do, to increase their efficiency, there could be secured from existing facilities a very largely augmented amount of service.

* * *

But would that solve the problem now presented to the railway managements and the railway regulating authorities? Unfortunately not. Anybody who will study the actual facts regarding the railway situation instead of forming mere impressions about it soon will see why this is the case. In the first place, there are certain to be still further large increases in traffic during the war. The government has only begun to spend the enormous sums, and to move the enormous quantities of materials, it will use in its war work, and there will be need for greater transportation facilities. In the second place, in order to get and keep on getting the greatest possible service from existing facilities

ties, it will be necessary fully to maintain them, and they are not now being fully maintained, and cannot, on present freight and passenger rates, be fully maintained.

There has been within recent years an enormous increase of operating efficiency and yet, except for short intervals of time, the general tendency of net return has been downward. Why? For the simple reason that wages and prices of materials and equipment have increased faster in proportion than efficiency of operation. If the number of ton-miles of freight transportation produced by a locomotive increases 20 per cent in a year, and other things remain equal, the amount of net money the locomotive will earn for the company that owns it will, obviously, increase. But suppose the cost of a locomotive increases 200 per cent, and the cost of the fuel used in it increases 100 per cent, and the wages of the engineer and fireman that run it increase 25 per cent. The necessary result will be a decrease in the net return earned by the locomotive unless there is an advance of the rates charged for the service it participates in rendering.

Now that is a rough but a perfectly just illustration of what is going on in the railway business and it suggests the only way in which under private ownership the problem of maintaining and increasing the capacity of the railways can be solved. There is no way in which, under private ownership, this problem can be solved except by giving the railways adequate increases of rates. What increases would be adequate? Nobody knows. That will depend entirely upon how large are the increases in traffic and the advances in wages, in the prices of materials and in the cost of capital.

* * *

One way which has been suggested to meet the situation is for the government to loan the railways several hundred million dollars; but that would be a mere palliative. The railways need not hundreds of millions, but billions to invest in new facilities. Mere hundreds of millions will do them no good except in the form of increases in their annual earnings to be used in paying their increasing expenses and the interest and dividends on the new investment of billions in them which should be made.

Some people continue to suggest that the government should buy one or two hundred thousand freight cars and put them into service. But an increase in the number of freight cars without a corresponding increase in the facilities for moving them would only aggravate the present condition. The railways need more locomotives and longer passing tracks and larger terminals much more than they need more freight cars. If they had more locomotives and larger terminals they could get much more service out of the freight cars they now have. Furthermore, as we have pointed out heretofore, if the government should loan them money, whether directly or in the form of an investment in freight cars, the railways would have to pay the interest on it; and how could they pay the interest on money borrowed from the government if they could not pay the interest and dividends on additional capital provided from private investors?

Finally we have the ever recurring suggestion that the only remedy for the situation is government ownership. But there never was a time when that suggestion was so inopportune and dangerous as it is now. For the government to attempt to finance the transfer of the railways from their present owners to itself would at this time cause a financial cataclysm. For it to undertake their management at this time, whether it actually acquired their ownership or left it in private hands and merely undertook their operation, would cause a demoralization in transportation by comparison with which the present conditions would look like the perfection of smooth running. No move the gov-

ernment could make at present would give more aid and comfort to the Kaiser and his allies in crime than an attempt on its part to take over the management of the railways. The government of the United States has before it already enough unsolved problems of unprecedented vastness, complexity and moment without having added to them a problem which in complexity and vastness would surpass any problem in connection with the war with which it is now confronted.

The problem of transportation during the war can be solved by the government by the adoption of the following measures:

1. Relieve the railways of the law-made restrictions which now interfere at every turn with their efforts to operate the existing facilities to their maximum capacity.

2. Give the present managements of the railways untinted encouragement and support in the efforts they are making to render to the government and the public the largest possible amount of useful transportation service.

3. Recognize the fact that as a war measure it is as necessary to let the railways of this country have all the labor, and all the materials and equipment they need, as it is to furnish materials and equipment to the railways of our European allies.

4. Grant the advances in rates which are necessary to enable our railways to meet their advancing expenses and taxes and also make such increases in their facilities as are requisite to enable them to support the rising flood of traffic which is being poured upon them by the government and the public.

The adoption of a less liberal, comprehensive and constructive program will result in national disaster.

The railways, ever since we entered the war, have been doing their part and doing it under difficulties, discouragements and hardships such as have been encountered by no other industrial or governmental agency. When will the government, in the interest of the industrial and military efficiency of America, remove these difficulties and discouragements and reduce these hardships?

RAILWAY MILEAGE AND THE SCRAP MARKET

THE present high prices of materials and the scarcity of certain materials at any price have brought about conditions which, while unique, are not without certain favorable aspects for the roads. Prominent among these is the high price of scrap which, while lower now than a few months ago, is still much above normal. The obvious and immediate result of this condition has been the collection and sale of all of the scrap accumulated on the property to secure the advantage of these high prices.

This has been carried even further on a number of roads where materials have been made available for sale which would not ordinarily have been released for a year or two. As an instance a number of roads have held in stock considerable quantities of second-hand rail released from main line service. In general this material has been used to relay branch lines according to a fixed program extending over a number of years. The rails and fastenings released on these branch lines are ordinarily too light for further use under the modern heavy equipment and they are, therefore, sold for scrap. One road which had a considerable tonnage of second hand rail in stock pushed its improvement program ahead and relaid practically all of this rail in its branch lines this year, finding that it was able to supply the new fastenings required and then to show a net profit of considerably over \$1,000 per mile, after deducting all labor and other charges directly incident to this work. This was made

possible through the high prices now being received for scrap rails and fastenings, the second hand rail having been charged out at the normal price at which it was being carried on the books.

Another development arising out of the condition of the scrap market has been the abandonment and sale of a number of small lines for the scrap materials they contained. Several bankrupt roads have recently secured the consent of the courts to abandon service and sell their properties to parties who purchased them solely for the track materials and equipment. So far as we have learned, this procedure has been followed only where the entire line has been insolvent and where little or no hope was held out for the future. However, the same lack of returns is to be found on many branch lines which form parts of systems, which as a whole are solvent. These branch lines constitute drains on the more prosperous portions of these systems and in many instances are of no more present necessity than the independent lines which are being taken up. It would seem a logical development of present conditions that these roads should endeavor to secure release from the necessity of continuing the operation of these more unremunerative branch lines. Fortunately conditions with respect to materials have not become so acute in this country as in Canada, where a considerable mileage of tracks has been taken up to secure the supplies needed elsewhere in Canada and on the French war front. If conditions should become such that similar action would be necessary in this country there is no question but that a considerable mileage of branch lines could be taken up and the materials diverted to better use, and that after the crisis had passed, the lines would never be rebuilt. Even though present conditions do not require such radical action it would be well to consider the advisability of eliminating waste of this character.

NEW BOOKS

Electric Railway Transportation. By Henry W. Blake, editor, "Electric Railway Journal," and Walter Jackson, business manager, formerly associate editor "Electric Railway Journal." First edition. 470 pages, 120 illustrations, 6½ by 9½ in. Bound in cloth. Published by McGraw-Hill Book Company, 239 West 39th Street, New York.

This is the first book on our knowledge devoted to the transportation methods and practices of electric railways. Most of the accounts of electric railway transportation practices which are mentioned in this book have appeared in the Transactions of the American Electric Railway Transportation and Traffic Association, or in the columns of electric railway press. The efforts of the authors of the present volume have been devoted to making this information more readily available in book form and adding such comment of their own as seemed to them of possible help to the operating man.

The book contains chapters on Organization and Definition; Adjustment of Service to Traffic; Accelerating Traffic Movement Along the Line; Accelerating Traffic Movement on the Car; Car Types in Relation to Traffic; City Timetables—Preliminaries; Interurban Schedules and and Despatching; Fare; Gas-Electric Practices and Devices; Public Relation; Promotion of Passenger Traffic; Traffic Signs for Car, Station and Road—Information for the Public; Competition; Freight and Express Business; Selection and Training of Men; Wages and Wage Agreements; Welfare Work; Discipline of Train Men; Forms of Extra Pay. All of these subjects are taken up in a thorough manner, and it is doubtful if there is anything that an operating man on an electric railway is interested in that is not discussed in this volume. The book is well illustrated, the various problems relating to the subjects just enumerated are thoroughly covered and the practice followed by certain electric railroads, or groups of roads, in regard to a given subject, is given.

Letters to the Editor

REDUCED FREIGHT RATES TO IMPROVE CAR LOADING

ROANOKE, Va.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I have no doubt many students of conditions created by the entrance of the United States in the war, especially as they affect and are affected by railway transport, have been impressed by the extraordinary results apparent from the campaign for heavier car loading and have wondered into how hard straits ordinary business would have been forced by the sudden absorption of railway facilities for movement of war material, had there not been this waste of car space to fall back on.

At first thought it would seem that the lack of economy in railway operation incident to light loading of cars in the past, and the resultant loss to shippers who pay the freight, is simply chargeable to failure to advance the minimum carload ratings to keep pace with increasing car capacity. I feel, however, that this is not wholly true by any means, although there are doubtless many cases where an increased minimum for carload shipments would not be harmful. There are many shippers and many communities that could not bear an increase in the carload minima for certain commodities, and their inability to move traffic would inevitably result detrimentally to the general public, both producing and purchasing.

Viewed from a broad standpoint, therefore, it would appear that the room for economy in peace times, as well as in time of war, lies with the transport of traffic between communities and between those shippers and consignees that are able to handle capacity carloads or cars loaded above the minimum weights specified for carload ratings. At present the test of patriotism and business necessity on account of car shortage is being applied. In ordinary times there must be other inducement.

Carload freight is carried for lower freight rates than l. c. l. Why not apply the same principle, i. e., "cost of the service," and while continuing the minimum carload rating as a designation of the least weight for which a car can be furnished, to allow a percentage reduction in the freight rate per 100 pounds for each 10,000 pounds loaded in a car beyond the minimum specified. If this were done many shippers would be able to employ more labor necessary to load cars heavier, and many consignees would acquire greater storage facilities for their material. The railways would be relieved of a large economic loss now inequitably distributed among shippers, producers and purchasers; and in figuring this loss the large sums necessary for putting in service freight terminals and power must be considered along with the investment in freight car equipment.

Careful study of this proposition will, I believe, indicate that it would in no case work any injustice or unreasonable discrimination against any part of the public interested in rail transportation. It is a counter-proposition to that of raising the minimum carload ratings, which latter, if done, would strengthen the "middleman," and no thinking person wants to do that.

INVESTIGATION OF QUEENSTOWN RAILWAYS.—The Queenstown Government Railways are the latest to be the subject of an investigation. Messrs. M. Kirwan and Arthur Cooper have been appointed a commission for the purpose of inquiring into and reporting on the administration.—*The Engineer, London.*



Floating Gang of Female Laborers Cleaning Tracks on the Pennsylvania Railroad

The Employment of Women in Railroad Work *

Number Fast Growing in "Housekeeping" Departments
and Increase in Technical Departments is Accelerating

By Stuart Bready

Special Agent, Philadelphia, Baltimore & Washington, Wilmington, Del.

TODAY we are all thrilled with the desire to co-operate, to give of our energy, to sacrifice in any patriotic and democratic way that may help us in our purpose to put an end to the Imperial German Government. The women are playing no small part in this purpose, and the working out of the entire situation both here and abroad, during and after the war, will be well worth watching.

What is expected of all of us calls to mind a legend. It is the story of an artist who painted a picture. Other artists had painted pictures which were much more notable than his, but this had a particular red glow upon it, and as the people came and went, they admired the picture, they liked the glow. They said, "I wonder where he got his color from," and one day they asked and he said, "I cannot tell you." And ever the artist went on painting, and he became whiter and whiter, and his picture became redder and redder. One day they came in and found him dead before his easel, and they looked to see if they could discover the secret of this wonderful red color, but they found nothing which they did not already have. But when they took him up to put his grave-clothes upon him they found above his heart the marks of a wound, healed by death, which heals many things. And they buried him and he was soon forgotten, but his picture lived on forever. And still the people said, "I wonder where he got his color from." That is a legend. But it has a lesson for all who would paint a picture which will be enduring. We must put all our energy, our life's blood, into the thing we are doing. In this war, we cannot hope to paint a picture which shall endure for democracy in all ages without such whole-hearted sacrificial help on the part of the women as well as the men. And this they are willingly giving us, more and more.

The position of women before the war is difficult to define. The majority of women did not earn wage or salary, the minority did. The majority were married, the minority were not. The majority were economically dependent, the minority were, through inheritance or wage-earning, independent. The war has led to changes in conditions the ultimate outcome of which cannot definitely be foretold. In the last two years skilled labor has become scarcer and scarcer. Employers have been compelled to put women at work which in ordinary times they would have been thought incapable of performing. Pre-war conditions can never be re-established, and in many cases it would be unwise to desire them. Instead of clinging to the past we ought to plan boldly for better and more permanent ideals, where all shall have the liberty of assuming full responsibility for their own lives. The cry of "equal pay for equal work" raised by women to protect their interests is but an expression of consciousness of ability to render service. It expresses self-respect and a revulsion against under-valuation in the eyes of the stronger sex.

Europe has for a century been accustomed to seeing women as laborers in the fields, in vineyards, as tradespeople, at railroad crossings. It has today no feeling of pity for them. It simply sees results. Undoubtedly there was a time when the laboring man in France watched the woman laborer with jealousy, even as many men in this country are doing today, feeling that success for her meant lower wages and fewer opportunities for him, but today he feels not so. Instead he acknowledges the situation. A Frenchman who had traveled through his country during the recent harvest, observing the well-nurtured crops, said, "Would it not be a good thing to keep the men at war?"

However, we in America cannot hope immediately to succeed in what has taken a century of experimentation elsewhere

* Abstract of a paper read before the New York Railroad Club, November 16, 1917.

to develop. The problem for us is a new one. It is as yet in its infancy. We have still to learn what it may mean. To secure real efficiency the woman must be carefully studied, instructed and disciplined. Special facilities must be provided for her comfort and convenience, and all this requires a certain amount of supervision, time and expense. Processes may often need to be simplified, the result being an unusual subdivision of operations in order to enable several women to perform work heretofore done as a whole by one man.

Of primal and evident importance in the problem, is the fact that woman is fundamentally and constitutionally different from man. She speaks a language of her own, is mentally and physically differently endowed by nature. Recognizing this as an obvious fact, we may divide all railroad work so far as female labor is concerned, into two distinct classes:

First: In the departments which we will term railroad housekeeping, there seem no reasons why the service of women should not be generally acceptable, and of far-reaching importance, provided the traditions of the railroads (and may we say in passing, in some respects the railroads have been smothered in cobwebs of traditions), can be broken through. There is no reason why women should not be responsible for the whole domestic condition of the railroad including the cleaning of cars, selling of tickets, dispensing of information, marking of bulletin boards, performing of minor, semi-important and important clerical duties of all so-called indoor departments. The most notable instance of woman's progress in railroad work in this regard is that of Miss Oden of Davenport, Iowa, who entered the employ of

injury, due to the fact that a woman's mind does not grasp the mechanics of machinery easily, and another, the fact of the necessity of long sustained physical exertion, in many instances requiring her to stand all day. In England this question has been dealt with by shortening the hours of work in shops where women are employed.

England has spent much time and effort on the whole problem of women in mechanical labor, and as a matter of interest, I have inserted a partial list of processes, prepared by the Labor Supply Department of the Ministry of Munitions, London, in connection with tool room and precision work, upon which women are successfully employed:

Cutters:—Operating backing-off lathe; turning on turret lathe; all grinding operations; drilling; sand blasting, and annealing.

Dies and Punches:—Operating turret, capstan and centre lathes, pre-



A Pennsylvania Block Signal Operator Delivering Train Orders to a Work Train



Unloading Scrap Wood at Thompson Shop, Pennsylvania Railroad

the Western Union as a clerk, became an operator, and is now the Tri-City Passenger Agent of the Burlington in that State.

Second: On the technical, mechanical and working side there is quite another question. The "neat handed Phyllis" is by nature unfitted for all work that may present itself in such departments. It is on the technical side that most study will have to be made. If the parts to be handled are not too heavy, or the exertion of operating various mechanical appliances does not require too much physical strength, a woman can do the work as well as a man, and frequently her suppleness of hand will enable her to perform certain manual operations with greater ease and dexterity. There are, however, in the mechanical departments still other considerations that enter into the question, such as liability to

cision grinders and drilling machines; turning, boring, facing and reaming; turning in chucking lathe.

Drills:—Parting off, turning on centre lathe, grinding and fluting twist drills.

Fitting and Assemblies:—Tool room work and cutters of all kinds, e.g., fitting, facing cutters, milling cutters, filing split bolt for capstan lathes. Fitting and assembling cutter bars.

Gages:—Grinding, milling, fitting and engraving.

Marking-Off:—Marking off all parts not too heavy for women to handle.

Reamers:—Turning, milling, backing off, fluting, polishing and glazing all types of reamers.

Saws:—Milling, hardening, punching, setting, cleaning and packing back saw blades; hardening and tempering fret saws; sharpening band and circular saws.

Test-pieces:—Operating lathes, bending, shearing, planing, shaping and drilling machines, and precision grinding machines, upon test pieces of all kinds.

Testing:—Applying the bending and shearing test to steel test pieces.

Various Work:—Operating lathes on rough and finished turning; universal, plain and slot milling machines; shaping, planing and slotting machines; hardening with muffle furnace and color chart, cutting tools of various kinds; grinding work in lathe, on relieving cutter, and polishing to limit of 0.0005 in.; viewing, gaging and inspecting.

I also submit another list of processes in connection with structural engineering and the manufacture of boilers of all kinds, upon which women are successfully employed in England:

Angle Straightening Machine:—Steel girders, steel rails.

Boiler and Condenser Tubes:—Cutting, rounding, trimming, shaping and slotting; screwing, facing and finishing; bending, heating by gas and hydraulic testing; inserting and packing tubes in condensers and oil coolers.

Buffing and Grinding Machines:—Plates, angle and cover plates for structural steel work.

Drilling:—Drills for all parts of steel structural work from the smallest gusset plates to rolled steel joists up to 30 feet long; vertical drills; radial drills; plates for lattice girder for railroad bridge; steel girders for overhead travelling crane; steel work for run ways; holes in boiler end plates; battery drills; pneumatic drills.

Edge Plate Planing Machine:—Boiler plates, general work up to 24 x 5 feet x 3/4 inch; steel plates for railroad bridges, etc.

Operations Upon Ferrules.

Foundry Work.

Horizontal Boring Machines:—Boiler flues.

Hot Bending Machine.

Laboring.—Steel erectors' laborers; general laboring and assisting in engineering and blacksmith shops.

Unloading from Canal Barges, Trucks, Etc.

Oiling Railway Parts.

Cleaning Locomotives.

Plate Laying.—For light gage railroads in works and yards.

Milling.—Boiler parts of all kinds.

Punching Machine.—Wrought iron bars; steel girders; junction and tie plates.

Repair Shop, Boiler.—Taking various parts to pieces; marking off their own drilling work; drilling, turning, planing and shaping the parts and reassembling the job.

Shearing Machines.—Shearing small steel plates and acting as helper.

Surfacing Machine.—Boiler flue flanges.

Various Work.—Driving steel hammers; all engraving work on boilers; assembling bolts and nuts; oxy-acetylene cutting light plates; fire-barreling small steel parts; electro-galvanizing; all painting; maintenance work scraping, brushing and tarring; storekeeping; recording in-coming and out-going material; assisting in power house; driving crane in boiler shops, and structural engineering shops.

These lists show to what extent England has developed female labor, and while we have not, on the railroads of this country, reached anywhere near this wide diversity of labor, as the war goes on we are finding the number of different occupations increasing, most slowly of course in the technical lines, but undeniably increasing in all lines.

To indicate this gradual increase, I append a table showing by occupations the number of female employees on the lines of the Pennsylvania Railroad, east of Pittsburgh, for five months beginning May 1, 1917.

STATEMENT SHOWING BY OCCUPATIONS AND MONTHS NUMBER OF FEMALE EMPLOYEES ON THE PENNSYLVANIA RAILROAD.

Occupations	Number of Female Employees 1917				
	May 1st	June 1st	July 1st	Aug. 1st	Sept. 1st
Agents	23	23	23	24	24
Asst. manager telegraph school..	1	1	1	1	1
Attendants—B. of I.	1	3	9	9	9
Attendants—parcel room	1	1	8	12	12
Attendants—station	4	1	4	4	4
Attendants—store room	1	10	19	30	62
Attendants—tool room	1	2	5	6	6
Batterywomen	1	1	1	2	2
Boilermaker's helper	1	1	5	5	5
Cashiers and assistants.....	5	6	5	5	2
Chainwomen	1	1	1	1	1
Chaperons	1	1	1	1	1
Cleaners—car	157	181	206	237	252
Cleaners—office	1	1	1	1	1
Cleaners—station	16	16	19	26	30
Clerks and stenographers.....	448	761	1161	1516	1896
Comptometer operators	10	10	10	10	10
Cooks	12	12	11	15	15
Despatchers—locomotive	1	1	4	4	5
Distributors—Pullman space	1	1	1	2	2
Draughtswomen	1	2	1	1	1
Draughting apprentices	1	1	2	2	2
Elevator operators	1	1	1	1	1
Gang leaders	1	1	1	1	1
Hammer operators	1	1	1	1	1
Janitresses	29	30	10	34	38
Kitchen—dishwashers	18	20	19	17	18
Kitchen—helpers	35	37	35	37	37
Kitchen—pantrywomen	21	21	21	21	21
Laborers	3	7	13	38	115
Machine hands	1	1	2	18	30
Machinists	1	1	1	1	1
Matrons—regulars and extras.....	83	83	84	78	79
Maids—regulars and assistants.....	17	17	17	17	16
Messengers and asst. messengers	194	666	1343	1343	157
Painters	1	1	1	1	4
Seamstresses	3	3	3	3	3
Shop hands	1	1	1	3	13
Signalwomen and as. signalwomen	60	65	77	55	64
Stewardesses	2	2	2	2	2
Tele. and tele. block operators.....	55	57	59	101	104
Telegraph operators—students	1	1	1	29	24
Tele. and tele. block operators.....	349	382	417	416	456
Telephone operators—P. B. exc....	40	40	41	45	41
Tenders—bridge	9	12	12	12	12
Tenders—switch	1	1	1	1	1
Ticket sellers and clerks.....	2	2	1	2	2
Tinsmith helpers	1	1	1	1	1
Tracers	1	1	1	1	1
Typists	69	70	78	91	89
Upholsterers	5	5	5	5	5
Warehousewomen	1	1	1	1	5
Watchwomen—crossing	1	1	5	30	45
Total	1494	1945	2525	3114	3730

It will be seen that while the greatest increases are noticeable in those departments which I have earlier designated as pertaining to the housekeeping of the railroad, it is also encouraging to notice a slow but distinct rise in the number of those engaged in the technical lines, such as shop hands, laborers, painters, warehousewomen, etc. It will also be seen from the tabulation that the total for September 1 is

more than twice that for May 1. While the figures for October 1 are not yet obtainable, the increase will be approximately 35 per cent in advance of the September 1 figures. For the present certainly, the Pennsylvania is proceeding in the employment of women at a careful and conservative rate, devoting a great deal of study to the problem. Under the direction of the superintendent of telegraph, a school of telegraphy has been established in Philadelphia. It is already well attended, and is producing most excellent results. In all departments, various matters of organization have been given much thought. On certain divisions where any considerable number of women have been employed, matrons are maintained, whose duties require them to look after the general welfare of the women. The general superintendent of the Philadelphia, Baltimore & Washington has issued instructions that a modest and suitable attire must be worn at all times. On the Maryland division the superintendent has issued orders that no women who are under the age of 25 shall be taken on. The reasons for this will doubtless suggest themselves to your own minds. The matter of apparel



Checking Counter, Pittsburgh Station Baggage Room

for those in the shops has, according to the job, assumed the utmost simplicity, and in many cases because of the liability of dresses catching in machinery, overalls have been adopted. A woman on the Baltimore & Ohio has designed a new jumper garment for women who work in the shops and has recommended that they wear the spiral puttees now so much in evidence on the soldiers.

After the war is ended will women continue to seek this kind of employment? Will greater wages be granted them than at present? Again, what will become of the multitude of men with families to support when they return from the war and find their places taken by women, mostly unmarried? The necessities of the present are laying foundations for future problems of a very serious, if not revolutionary character. In Canada, France, England, and also in Germany, the movement is largely on a patriotic basis. It is rapidly assuming the same proportions here. Certain railroads in the United States are encouraging the wives and daughters of employees who have "come across" to fill the places of the departed ones on the plea that any woman who by working releases a man, or equips a man for fighting, does national war service. A million women to take the

place of a million men soon to go to France, are to be card-indexed throughout the country by the National Defense Council Committee. Every woman over 16 years of age will be asked to register, to check from a list of 154 occupations those for which she has had training or those for which she wishes to be trained and to indicate whether she will serve for salary, expenses or as a volunteer.

However, all this is an emergency measure, and the officers of the railroads for the most part, have not and cannot formulate any definite plans for post-bellum days. To a casual onlooker, it would seem that some of the women at least will remain in their new places. Some have already been promoted. By the close of the war others will be still higher in rank. They may have become so important a part of the organization, that it will be difficult to remove them. Their effect on the morale of an office will in many instances be difficult to overlook. In work requiring patience—work which might be called monotonous—they will doubtless have proved more patient than men. They are proving so today. In dealings with the public on occasions where a man would terminate a situation in a wordy war, the female will more often have acted with despatch and diplomacy. She is at least willing, quick witted and as a rule always "on the job." Besides she is more often a "sticker" than a "floater," remaining ordinarily in one job a greater length of time than a man. The argument that women will work for less money and thus lower wages and crowd out the men is untrue. In certain classes of work the average woman today believes herself the equal, if not in many instances the superior in earning capacity. Two years ago in England women were admitted to the Railwaymen's Union and a considerable number have joined.

So far as the railroads are concerned, it is extremely un-



A Woman Attendant in the Pennsylvania Storehouse at Renova, Pa.

likely that they will be slow to see that there are certain fields of labor in which women are by nature peculiarly unfitted to enter, particularly certain technical lines; but it is just as certain that the railroads will be quick to discover their excellent qualities and their possibilities in the lines in which they have, and will continue to have, "made good."

DISCUSSION

The value of paying careful attention to the education of women employed in railroad work, for the performance of their specific duties, was referred to several times in the discussion. It was suggested that the benefits obtained from the instructions given women employees might have a far-reaching effect in drawing attention to what might be accom-

plished if similar methods were extended to all new employees.

The experiences of the Canadian railways and the munitions manufacturers in England were referred to. In Canada, where women are extensively employed in railroad shops, it has been found that the best results have been obtained where matrons are employed to exercise general supervision over the women and to look after their welfare. Special attention has also been given to the provision of adequate rest room facilities, so that the women may have a comfortable and attractive place to congregate by themselves during the noon hour.

In England, with a population of about 42,000,000 people,



Women Employed in the Tool Room at the Wilmington (Del.) Shops of the P. B. & W.

more than 1,000,000 women are employed in the manufacture of munitions of war alone. By a well developed policy of dilution of skilled labor, extraordinary results in increasing output have been accomplished in the face of a growing shortage of skilled mechanics. Women have been employed to replace men wherever the men can be used to perform more skilled operations. The number of operations requiring high skill have been reduced wherever possible by higher specialization.

POST-WAR RAILWAY PROBLEMS.—Few after-the-war problems are so fascinating as those connected with the rebuilding of railways destroyed or damaged in accordance with military plans. Detailed figures regarding the necessary reconstruction work are naturally not available, as the bulk of the mileage concerned is in territory occupied by the enemy, but, as a matter of fact, these data would be insufficient by themselves. First of all, while in France and Belgium the problem is mainly one of replacing and repairing systems quite adequate if they be restored to pre-war conditions, in Russia, Poland, Serbia and Roumania it will be necessary not only to repair the ravages of the war, but also to extend networks which before the war were not up to standard of twentieth century requirements. In all these countries, deficiencies in working stock will also require to be made good. Where the mileage of a country's railways is insufficient, the supply of locomotives, passenger and freight cars will have to be increased in proportion to new construction, while in France and Belgium—probably in Serbia and Poland as well—the problem is complicated by the German seizure of working stock, much of which is being operated far from its usual territory. The restoration of this loot, or the payment of indemnities in lieu thereof, will not be the least important question for international jurists to solve when peace terms are being discussed. Other post-war railway problems are the Russian gage question, the linking up of the railways of Greece with those of the rest of Europe, and the best methods of utilizing the Bagdad Railway as a through route to the East. As to the future of the Bagdad line, we may certainly hazard the prediction that it will not remain under German ownership or control.—*Railway Gazette, London.*

Non-Essential Transportation May Be Curtailed

Not an Admission of Failure—Traffic Still Growing—
Ways of Still Further Increasing Railroad Efficiency

WASHINGTON, D. C., November 3, 1917.

POINTING out that transportation conditions, unless more vigorously dealt with by all concerned, will grow more acute in the near future, the Railroads' War Board on November 15 issued a statement saying that the time may be almost here when it will be necessary to distinguish in railway transportation between things that are essential and things that are not essential. The statement also made public the fact that the war board has furnished to Judge Lovett, the administrative officer under the provisions of the priority of shipments act, and to Dr. Garfield, the government fuel administrator, at their request, a list compiled by a committee of railway traffic officers showing commodities, the transportation of which is regarded as non-essential under present conditions. One part of this list is made up of about 450 commodities whose transportation, it is believed, could be dispensed with without any serious inconvenience to the public. Another part contains about 75 commodities which it is believed the public could dispense with, but not without inconvenience. How many of these commodities shall be denied transportation, the statement said, is a matter for the priority director and the fuel administrator to determine. If the non-essential commodities are eliminated, the board has no doubt that the railways can transport all commodities required by the government in carrying on the war and by the people for their subsistence and comfort.

The list of commodities regarded as non-essential has not yet been made public and probably will not be until Judge Lovett and Dr. Garfield have given further consideration to the matter. Judge Lovett issued a statement on November 17, apparently designed to set at rest fears that any commodities would be denied transportation for the present, saying:

"While the situation may change, I am not at this time contemplating any further action with respect to transportation of non-essentials. Priority Order No. 2, with regard to open-top cars, went as far as it seemed wise to go in dealing with that problem by restricting the transportation of non-essentials. Conditions, however, will be constantly observed. Whether the coal shortage requires restriction of the coal supply of non-essential industries is a question for the fuel administrator, Dr. Garfield, to determine; and if any priority orders become necessary in the furtherance of his policy in that regard, they will be made only upon his request.

"As to the War Industries Board, apart from my action under the Priority Act with respect to transportation, I may say that the industries of the country would seem to be justified in assuming from the action of the board in the matter of copper and steel prices and its record generally to date, that it is the desire and policy of the board carefully and liberally to conserve the interest and welfare of industries. I feel safe in saying that the board will take no action designed to eliminate any non-essential industry without reasonable notice and an opportunity to be heard."

In making the announcement, the war board took occasion to make to the public a frank statement in explanation of the railway situation as it exists and the means which it believes should be used in dealing with the situation. This statement is in part as follows:

"The transportation situation is becoming the subject of growing public uneasiness and agitation. Those responsible for the operation of the railways realize that transportation conditions, unless more vigorously dealt with by all con-

cerned, will grow more acute. Both the public and the managements of the railways must courageously face the fact that under the trying conditions which will develop this winter it probably will become impossible for the carriers to handle all the traffic which the shipping public can offer. The number of unfilled requisitions for freight cars, after having largely declined between May 1 and Sept. 1, in spite of a vast augmentation of traffic, showed an increase on October 1 and a further increase on November 1. The main reason, of course, why the railways are having such great difficulty in handling all the traffic is that there has been an enormous increase in its volume, and that this still continues. Statistics which have just become available show that in the months of April-August, 1917, inclusive—those being the first five months after the entrance of the United States into the great war—our railways handled 16 per cent more freight traffic than in the same months of 1916, which year broke all records up to that time. The traffic handled in these five months of 1917 was 50 per cent greater than that moved in the same months of 1915; and, in fact, exceeded the total traffic moved in any entire year prior to 1904. When the statistics for September are available they will show that in the six months ending with that month the railways handled more freight traffic than in any entire year prior to 1907.

"Perhaps the most remarkable figures are those regarding the movement of coal. In the six months, May to October, inclusive, there were moved 150,000 more carloads of anthracite than in the same months of 1916, an increase of 18 per cent, and 751,000 more carloads of bituminous and lignite coal than in the same six months of 1916, also an increase of 18 per cent.

"A total of 116,000 carloads of freight have had to be hauled to the National Army and National Guard camps; and up to the time of the latest report over 17,000 carloads of freight had been handled for the shipping board.

"The railways are still moving a total freight traffic surpassing any ever known before, and it should be borne in mind that they are doing this with almost no greater facilities than they had two years ago and under conditions which prevent them from materially increasing their facilities. Another important phase of the situation to which attention should be called is that the railways this year have had to handle the largest passenger business ever known. This has been a serious obstacle to needed reductions in train service. In addition, between August 1 and November 12 they transported 1,200,000 soldiers to training camps, cantonments and points of embarkation. This troop movement involved the use of approximately 2,750 special trains.

"This large passenger traffic and the troop movement have complicated matters and increased the difficulty of moving the freight traffic. Large troop movements are still being made, and the railways are moving to the training camps and cantonments about 75,000 carloads of supplies a month.

"These facts are sufficient to explain the situation. The railways have secured much more service from every track, every car, every locomotive, than ever before, and the fact that the unfilled requisitions for freight cars amounted on November 1 to only 140,000 in spite of the tremendous increase in traffic reflects great credit upon their performance.

"Upon this record of actual achievement the railroads rely on the support of public opinion, despite much of what Commissioner Clark of the Interstate Commerce Commission has characterized as unfair criticism from the people

who are trying to direct attention to alleged faults of the others, in order to avoid having their own shortcomings and evil doings brought into the light.

"But the public naturally is not so much interested in what the railways have done as it is in what they probably will be able to do during the coming months. The course of developments is forcing those responsible for their operation to anticipate that probably they will become unable to provide transportation for all the classes of commodities which they have been moving.

"The situation is similar to that in other industries. The steel manufacturers cannot produce all the steel needed; the coal mines cannot produce all the coal needed, and the farmers have not produced all the wheat needed. Other industries, faced by similar conditions, under the sanction and direction of the government are reducing the amount of fuel and materials furnished to business concerns producing things not essential to carrying on the war."

Then follows the announcement regarding the proposed list of non-essential commodities. The statement adds that "those responsible for the operation of the railways do not wish to be understood as conceding that the transportation lines have reached the limit of their capacity. They are still increasing the amount of traffic they are handling, and with greater exercise of skill and energy by railway officers and employees and increased co-operation from the shipping public and government officials, including the regulation authorities, the freight service rendered can still be largely augmented.

"The Railroads' War Board is issuing to railway officers and employees, and to the public, detailed suggestions in addition to those already made as to methods by which this result can be accomplished, and we have no doubt that these will be received and acted upon as similar suggestions heretofore made have been.

"The difficulties with which the railways were confronted at the beginning of the war were very great. Some of these have been overcome. The increase during the first five months of the war of 16 per cent in freight traffic handled with practically no increase in locomotives or cars, was equivalent to the addition of 5,000 locomotives and 360,000 cars to the number in service.

"The difficulties now confronting the railways are even greater than those they faced at the beginning of the war. They cannot get anywhere near all the men they need. They have lost many of their most efficient officers and employees because of their enlistment in the service of the government and other reasons, and the new men, of course, are not as efficient as those we have lost. It is impossible for the carriers to get the materials and new equipment they need because it is thought by those in authority that the national welfare demands the output of the iron and steel mills and of the railway equipment concerns be devoted to other purposes.

"Great, however, as are the difficulties which the railways are encountering in their efforts to render adequate service, we believe that if the government and the public will be patient and will continue to give the managements of the railways their co-operation, most of these difficulties will be overcome."

NOT AN ADMISSION OF FAILURE

This statement from the Railroads' War Board is referred to by a writer in the Washington Post as an admission by railroad men "that the present state of affairs has continued long enough and that government control is the most feasible remedy now in sight." In a letter to the editor of the Washington Post in reply to this assertion, Fairfax Harrison, chairman of the Railroads' War Board, challenged it as without foundation. "We are in close conference constantly," he said, "with railroad men, business men and govern-

ment officers and none of them has ever expressed the opinion that the present state of affairs has continued long enough or that government control of the operation of railways is desirable. A statement exactly opposite would more accurately reflect the views expressed not only by railroad men but by members of the cabinet and other government officers."

The preparation of the list of non-essential commodities at the request of Judge Lovett and Dr. Garfield, Mr. Harrison said, cannot, except by most strained interpretation, be construed as an admission that transportation conditions demand any radical change in the organization and methods now being used in the operation of the roads.

"We are not advocating a 'let well enough alone' policy," he said, "and welcome any and all helpful suggestions. The Railroads' War Board and the managements of the individual railways are putting forth their utmost efforts to meet the transportation demands of the country, and we confidently believe, as we have indicated in previous statements, that under the present arrangement, the railways will be able to render all the transportation of essential articles necessary. If, however, more radical measures become necessary, the Railroads' War Board will not hesitate to recommend such changes. Therefore, the agitation of proposals for radical changes in the existing organization and methods without careful previous consideration is ill-timed and dangerous. Their adoption would result in a demoralization in the transportation field, greatly reduce the efficiency of the railways and be disastrous to the commercial and military interests of the country."

SUGGESTIONS FOR INCREASING THE EFFICIENCY OF THE RAILROADS

The detailed suggestions referred to in the statement regarding additional methods for increasing the efficiency of the railroads are contained in Bulletin No. 42 issued by the war board on November 15, addressed to all railroads, and are as follows:

"We are approaching the winter with apprehensions of possible congestion on our railroads, notwithstanding all that has been accomplished by the hearty co-operation with us of government agencies, shippers and the general public, in increasing their efficient operation. Our reports show that in the second quarter of 1917 each locomotive handled 16.1 per cent and each freight car 15.3 per cent more revenue ton miles than in the corresponding period in 1916, equivalent to the addition of 4,985 locomotives and 361,000 freight cars to the equipment of the latter year. While the committee gratefully accords credit for this showing to the co-operative efforts of the carriers and the public, it considers it necessary to direct attention to the extraordinary *additional* amount of transportation that the carriers will be called on to supply this winter, through the operation of conditions that have developed since our entry into war, the pressure from which is constantly and rapidly increasing in intensity.

"The commandeering of ships engaged in Atlantic and Pacific coastwise trade, and of seagoing tugs plying between Newport News and New England points, throws on the railroads the burden of transporting much of the New England coal and cotton supply that formerly moved by water. Many more troops, in addition to 1,200,000 already moved, will have to be transported, and at least 2,500 carloads of supplies for their use must be handled *DAILY* this winter. Proper response to these demands, and to the almost unlimited calls for fuel from all parts of our country, will require unremitting effort.

"It is evident, therefore, that however heartily the public has already responded to our requests for co-operation, additional and most strenuous endeavor must be made, both by us and by them, to overcome the stress of winter weather,

overworked plant, and depletion of forces through calls to the flag and resignations to accept employment in shipyards and munitions factories.

"Repeating and emphasizing the suggestions in our Bulletin No. 12 of May 4, 1917, to strive for increased efficiency, the following additional ones are offered:

"1. Study thoroughly all priority and other governmental orders issued to promote movement of traffic and use of equipment, comply cheerfully and promptly therewith, and



St. Louis Globe-Democrat

There Can Be but One Answer

adopt the same attitude towards the orders of the Commission on Car Service.

"2. Redouble effort to:

- (a) Increase the loads per car of bulk grain and other commodities, much of which still moves in light loads.
- (b) Expedite car movements through yards and terminals.
- (c) Check up and enforce demurrage rules rigidly.
- (d) Check up and eliminate cross-haul of commodities.

"3. Unload company material much more promptly.

"4. Increase lading in L. C. L. merchandise cars, by establishing 'sailing days,' a practice used with great success by some of our constituents.

"5. Increase fuel economy by closer inspection of firing practice, and by extending the use of superheated steam, feed-water heaters, etc.

"6. Review switching service at terminals, and prescribe special movements, so as to cut out all unnecessary detention of cars.

"7. Wherever transportation can be conserved, avoid the use of unreasonably circuitous routes, carefully avoiding, however, overloading direct routes.

"8. Lengthen passenger and fast freight train schedules during the winter, to promote punctuality, and avoid demoralization of traffic that invariably follows failure of regular trains to make their schedules.

"On single track, as most of our lines are, the number of meeting points and opportunities for collision decrease much more rapidly than the number of trains. For instance, 10 trains each way daily involve 100 possible meets, with the delays incident thereto, and offer equal opportunity for head-on collisions; by reducing the number of trains to 7, or 30 per cent, the possible meets, delays, and collisions fall to 49, or 51 per cent.

"The loss of equipment service resulting from a reduction of speed from 20 to 15 miles per hour, is suffered on the time it is moving only, and as this is but a small percentage of the total time consumed on a trip, the actual loss is very small, and is much more than offset by the GAIN of 15 per cent in tractive power of a typical freight locomotive at the lower speed.

"9. Wherever possible, arrange for common use of terminals and facilities, to tide over threatening emergencies.

"10. Curtail reconsignment privileges in every possible way.

"11. Encourage the use of motor trucks and co-operation with trolley lines for handling short-haul freight.

"12. Enlist the services of water transportation lines in all reasonable and practicable ways.

"13. Start a systematic, vigorous campaign to provide



From the Evening Mail, New York

Uncle Sam—"If Those Fellows Don't Quit Their Quarrelling, by Gum, I'll Run the Railroads Myself!"

universal interline waybilling, a study of the operation of which on one large system convinces us will result not only in a large money saving, but in saving 12 to 18 hours' time on cars and the continuous services of one switch engine, handling setbacks account 'no billing,' at each representative terminal.

"14. Keep seaports and regional gateways free of congestion, by prompt use of embargoes, which should be established immediately on signs of trouble, without waiting, as has frequently been done, until congestion has actually oc-

curred. An ounce of prevention is worth not one but many pounds of cure.

"The railroads generally are very short-handed, some of our constituents reporting a net shortage of 12½ per cent in the number and a much larger percentage of loss in the efficiency of its employees, because of the necessity of filling vacancies with unskilled and inexperienced men. We recognize that everyone is doing his best, in trying conditions, to help his country win the war, but if insuperable difficulties should arise to prevent us from giving the public as good service as we desire, we ask every railroad executive to make it clear why we failed, and to request the public to continue to exercise the patience and tolerance that they have heretofore shown."

STATISTICS SHOW INCREASED EFFICIENCY

The steadily increasing efficiency of freight operation is again reflected in the monthly report compiled for the Railroads' War Board by the Bureau of Railway Economics of statistics showing the results of freight operation during the month of August. The returns included in this statement represent about 97 per cent of the operated mileage of roads of Class 1, which during the month show an increase of 8.4

per cent in revenue ton miles transported with an increase of only 1.7 per cent in the number of freight locomotives and 2.5 per cent in the number of freight cars in service. The details are shown in the table. A statement has also been compiled showing the comparative results of freight operation for the five months, April to August, 1917, as compared with the same period of the previous year for certain selected features of the report. This shows an increase in revenue ton miles of 23,904,579,696, or 16.2 per cent, while the average number of freight locomotives in service increased only 1.4 per cent and the average number of freight cars in service increased 2.2 per cent. The average number of tons per train increased from 625 to 675, or 8 per cent. The tons per loaded car from 24.8 to 27, or 8.9 per cent, while the average mileage per locomotive per day increased from 65.3 to 68.7, or 5.2 per cent, and the average mileage per car per day increased from 27.3 to 28.1, or 2.9 per cent. The percentage of freight locomotives in shop or awaiting shop was reduced from 15.6 per cent to 14.1 per cent, and that of freight cars in shop or awaiting shop from 6.4 to 5.8 per cent. The revenue ton miles per locomotive increased 14.5 per cent in the five months operated, and the revenue ton miles per freight car increased 13.7 per cent. These statistics are for 225,349 miles of road.

MONTHLY REPORT OF FREIGHT OPERATION OF STEAM RAILWAYS, AUGUST, 1917

Item	UNITED STATES				EASTERN DISTRICT			
	1917	1916	Increase or decrease		1917	1916	Increase or decrease	
			Amount	Per Cent			Amount	Per Cent
Freight train-miles.....	54,235,124	53,018,200	1,216,924	2.3	21,720,903	21,636,481	84,422	0.4
Loaded freight car-miles.....	1,333,670,890	1,355,084,353	d 21,413,463	d 1.6	568,802,008	587,566,299	d 18,764,291	d 3.2
Empty freight car-miles.....	606,326,158	564,482,813	41,833,345	7.4	263,982,795	263,475,405	507,390	0.2
Total freight car-miles—loaded and empty.....	1,939,997,048	1,919,577,166	20,419,882	1.1	832,784,803	851,041,704	d 18,256,901	d 2.2
Freight locomotive-miles.....	65,384,034	63,668,168	1,715,866	2.7	29,189,026	28,804,593	384,433	1.3
Revenue ton-miles.....	34,172,924,079	31,531,700,934	2,641,223,145	8.4	16,168,897,766	15,118,995,684	1,049,902,082	6.9
Non-revenue ton-miles.....	3,029,508,389	2,700,060,378	329,448,011	12.2	975,314,679	809,736,749	165,577,930	20.4
Average number of freight locomotives in service.....	30,371	29,855	516	1.7	12,451	12,282	169	1.4
Average number of freight locomotives in shop or awaiting shop.....	4,293	4,587	d 294	d 6.4	1,843	1,966	d 143	d 7.2
Average number of freight cars in service.....	2,307,031	2,251,182	55,849	2.5	1,180,955	1,152,775	28,180	2.4
Average number of freight cars in shop or awaiting shop.....	139,147	150,281	d 11,134	d 7.4	75,330	79,690	d 4,360	d 5.5
Home.....	105,077	122,062	d 16,985	d 13.9	55,984	64,776	d 8,792	d 13.6
Foreign.....	34,070	28,219	5,851	20.7	19,346	14,914	4,432	29.7
Tons per train.....	686	646	40	6.2	789	736	53	7.2
Tons per loaded car.....	27.9	25.3	2.6	10.3	30.1	27.1	3.0	11.1
Average miles per locomotive per day.....	69.4	68.8	0.6	0.9	75.6	75.7	d 0.1	d 0.1
Average miles per car per day.....	27.3	27.3	d 0.4	d 1.5	22.7	23.8	d 1.1	d 4.6
Per cent of empty car-miles.....	31.3	29.4	1.9	6.5	31.7	31.0	0.7	2.3
Per cent of freight locomotives in shop or awaiting shop.....	14.1	15.4	d 1.3	d 8.5	14.8	16.2	d 1.4	d 8.7
Per cent of freight cars in shop or awaiting shop.....	6.0	6.7	d 0.7	d 10.5	6.4	6.9	d 0.5	d 7.2
Revenue ton-miles:								
Per locomotive.....	1,125,183	1,056,161	69,022	6.5	1,298,062	1,230,988	67,074	5.5
Per freight car.....	14,813	14,007	806	5.8	13,691	13,115	576	4.4
Average miles operated—single track.....	224,251,446	224,503,445	d 251.99	d 0.1	55,901,244	56,140,411	d 239.17	d 0.4

Item	SOUTHERN DISTRICT				WESTERN DISTRICT			
	1917	1916	Increase or decrease		1917	1916	Increase or decrease	
			Amount	Per Cent			Amount	Per Cent
Freight train-miles.....	9,943,204	9,074,714	868,490	9.6	22,571,017	22,307,005	264,012	1.2
Loaded freight car-miles.....	229,054,388	215,709,570	13,344,818	6.2	535,814,494	551,808,484	d 15,993,990	d 2.9
Empty freight car-miles.....	113,438,998	91,961,612	21,477,386	23.4	228,904,365	209,055,796	19,848,569	9.5
Total freight car-miles—loaded and empty.....	342,493,386	307,671,182	34,822,204	11.3	764,718,859	760,864,280	3,854,579	0.5
Freight locomotive-miles.....	11,054,928	10,094,245	960,683	9.5	24,769,330	24,769,330	—	—
Revenue ton-miles.....	6,003,243,039	5,227,001,875	776,241,164	14.9	12,000,783,274	11,185,703,375	815,079,899	7.3
Non-revenue ton-miles.....	568,601,920	520,285,018	48,316,902	9.3	1,485,591,790	1,370,038,611	115,553,179	8.4
Average number of freight locomotives in service.....	5,433	5,329	104	2.0	12,487	12,244	243	2.0
Average number of freight locomotives in shop or awaiting shop.....	715	690	25	3.6	1,735	1,911	d 176	d 9.2
Average number of freight cars in service.....	315,122	310,092	5,030	1.6	810,954	788,315	22,639	2.9
Average number of freight cars in shop or awaiting shop.....	16,299	20,920	d 4,621	d 22.1	47,518	49,671	d 2,153	d 4.3
Home.....	12,990	17,996	d 5,006	d 27.8	36,103	39,290	d 3,187	d 8.1
Foreign.....	3,309	2,924	385	13.2	11,415	10,381	1,034	10.0
Tons per train.....	661	633	28	4.4	598	563	35	6.2
Tons per loaded car.....	28.7	26.6	2.1	7.9	25.2	22.8	2.4	10.5
Average miles per locomotive per day.....	65.6	61.1	4.5	7.4	64.9	65.3	d 0.4	d 0.6
Average miles per car per day.....	35.1	32.0	3.1	9.7	30.4	31.1	d 0.7	d 2.3
Per cent of empty car-miles.....	33.1	29.9	3.2	10.7	29.9	27.5	2.4	8.7
Per cent of freight locomotives in shop or awaiting shop.....	13.2	12.9	0.3	2.3	13.9	15.6	d 1.7	d 10.9
Per cent of freight cars in shop or awaiting shop.....	5.2	6.7	d 1.5	d 22.4	5.9	6.3	d 0.4	d 6.4
Revenue ton-miles:								
Per locomotive.....	1,104,959	980,860	124,099	12.7	961,062	913,566	47,496	5.2
Per freight car.....	19,051	16,856	2,195	13.0	14,798	14,189	609	4.3
Average miles operated—single track.....	41,867,196	42,059,739	d 192.63	d 0.5	126,501,066	126,303,258	197,811	0.2

d Decrease.

National Industrial Traffic League

Constructive Discussions by Public-Spirited Commissioners of Demurrage, Bills of Lading, Express Rates

THE National Industrial Traffic League held its annual meeting at the Waldorf-Astoria Hotel, New York City, on November 15 and 16 with about 150 members present. G. M. Freer, manager of the Traffic Department of the Cincinnati Chamber of Commerce and president of the League, presided and, in the absence of Secretary O. F. Bell, that position was filled by E. F. Lacy, of Chicago, assistant secretary.

The first business was the election of officers for the ensuing year and the present incumbents were re-elected, namely, Messrs. Freer, Bell (traffic manager of the Crane Company, Chicago), Lacy, and W. H. Chandler, manager of the Transportation Department of the Boston (Mass.) Chamber of Commerce, vice-president. F. B. Montgomery was made chairman of the board of directors and H. C. Barlow chairman of the Executive Committee. The report of the secretary-treasurer showed \$4,016 on hand, of which \$3,000 is of the nature of an emergency fund, drawing interest. The membership dues were increased last year for the purpose of providing this fund; and the amount of dues collected, according to the report, was nearly \$12,000.

The Executive Committee presented a report recounting its activities since the last meeting (at Buffalo). In connection with the new rules of the Interstate Commerce Commission regarding the filing by railroads of applications for leave to issue new tariffs, the League has called to the commission's attention the importance of requiring the railroads, without exception, to confer, in advance, with representatives of the shipping public; and the commission has been asked to prescribe a form of application which shall show how and to what extent this duty of conferring with shippers has been carried out. The League also asked that all such applications for authority to issue tariffs should be filed at every place at which the railroads are required to maintain complete public files of tariffs. It is understood that the Commission proposes to issue a daily bulletin giving information about these applications.

In this discussion of the question of tariffs there was voiced a demand that every tariff should show, in summary form, on the first or second page, what changes have been made, especially advances on rates in former tariffs; but it was the consensus of opinion that in many cases such a rule could not reasonably be complied with.

DEMURRAGE

The Committee on Car Demurrage and Storage, F. B. Montgomery, chairman, presented an interpretation of demurrage rule No. 2, section A (allowing 48 hours' free time for unloading), as applied to a case where there are two minimum carload shipments in one car consigned to different consignees in the same town. It was held that each consignee should have 48 hours, free of interference, in which to unload his freight. The meeting adopted this interpretation.

The committee reported its interpretation of demurrage rule No. 2, section B, paragraph 3. The committee recommends that this rule (allowing 24 hours' free time) should apply to all cases where a car is delayed because a connection rightfully demands prepayment or the surrender of the bill of lading; and this the convention approved.

The committee made a number of suggestions in regard to changes in storage rules No. 1 and No. 5, and these were approved by the meeting.

The committee has had considerable discussion of demurrage rule 5, section A, covering constructive placement; and reported that further conferences were to be had with the American Railway Association's Committee on Relations. In regard to section B of rule 6, imposing a demurrage charge in case a car is placed for a shipper and he does not use it, the American Railway Association proposes to add to the demurrage charge the regular switching rate for each move. The committee has protested against this new rule, because of this switching charge addition and for other reasons. Shippers who have been consulted believe that no switching charge should be made, for any movement, except according to rates shown in regular published freight tariffs. In the discussion on the report it was pointed out that this rule, allowing a car thus unused to stand 48 hours, was liable to be wasteful; it does not cure the evil which is aimed at; it will not prevent interplant use of cars. The action of the committee in protesting against the rule was approved.

Reporting on the agitation by some railroad men to abrogate the average agreement and the complaints of some consignees that it ought to be more liberally applied to cars which are held en route to complete loading (and which are allowed one day for the purpose), the committee finds that the American Railway Association has disapproved the agitation for abolition of the agreement at the present time and has so notified its local committees; and no action is recommended.

Considering the question of the desirability or undesirability of demurrage bureaus (like that now in operation at Boston), the committee found much difference of opinion; and had done nothing except to appoint a subcommittee of three to discuss the matter, if found desirable, with the Interstate Commerce Commission. This action was approved by the meeting.

FREIGHT CLASSIFICATION

The report of the Classification Committee brought out a long discussion on the desirability of asking the railroads for more liberal rules to permit the combining of different commodities in a single carload at a carload rate. In some cases this practice has increased loading efficiency and in others, it is claimed, has not. Such clauses in the classification are abused by the mixing of commodities that have no legitimate relation to each other.

On the subject of uniform classification the committee reported that in the next revision of the Western Classification about 87 per cent of the descriptions will be in conformity with the descriptions adopted by the Uniform Classification Committee. This next revision, which will be No. 55, will contain 7,921 items, an increase of about 600 over the last one.

The railroads contemplate putting into the next Western Classification a rule stipulating that an article shall not be considered as knocked down unless it has been taken apart so as to reduce materially the space occupied. This has been objected to as not being sufficiently explicit, and the committee has been asked to recommend that the tariff shall set forth, in each case, just what must be done to an article to entitle it to the K. D. rating. The point was brought out that every shipper knows what is reasonable in this matter, and that all that is needed is competent and impartial inspectors on the part of the railroads; but the meeting finally

voted to instruct the committee to endeavor to secure explicit definitions, in the classifications, for each item.

In the revision of the Official Classification there is a proposal to take out carload ratings on about 75 commodities, and shippers objecting to this have already gone to the Interstate Commerce Commission with their complaints. These elisions are proposed on the ground that the commodities are never shipped in carloads; but the discussion brought out that some shippers want certain of these rates only to use them under rule 10, which permits mixed carloads.

FREIGHT CLAIMS

The committee on this subject proposed the addition of a line in the standard bill of lading for the street address of the consignee; and the meeting ordered the request to be laid before the Interstate Commerce Commission. The committee reported a need for a manual for the use of shipping clerks covering the marking, packing and handling of freight, but no action was taken. A strong argument was made for the enforcement of the rule requiring the marking of every package and the erasure of old marks. There is a great waste of time and energy in tracing for lost packages, which work would be saved if everything were properly marked. One member urged that the Car Service Commission be asked to order the rejection of shipments not properly marked.

Mention of the subject of tracing brought out a long discussion on the great amount of useless tracing and the difficulty in getting proper attention to tracers which really are necessary. One concern, shipping 300 cars a month, had boasted of sending out tracers after every shipment, within a day or two, and named the roads which cheerfully attended to such tracers, virtually furnishing to the shipper progress reports for every shipment. This abuse was condemned as impairing the railroads' ability to properly attend to legitimate tracing. This practice of indulging shippers in the habit of asking to have shipments traced before they have had time to reach destination was strongly condemned by a number of speakers; and one Chamber-of-Commerce commissioner moved to approve the use, by railroads, of a printed circular, declining to send tracers prematurely, this circular to be pinned to the application and to constitute the only reply to such applications. One New England road was cited as receiving 1,400 requests a week for these illegitimate tracers.

The speakers made a clear distinction between ordinary tracing and requests for special attention to shipments which must be expedited; and one of them said that if suitable junction records were kept, so that inquiries could be promptly answered, the matter of tracing would be greatly simplified. It was pointed out, however, that such records are not kept for l. c. l. shipments and probably could not be reasonably required.

BILLS OF LADING

The committee on this subject made a brief report on a proposed blank combining a bill of lading with a waybill, but after a very brief discussion the subject was laid on the table.

Certain railroads in the southwest have proposed to make a charge for issuing a bill of lading for a shipment to be billed "to order, notify," but the committee, after conferring with prominent railroad officers, concluded that there was no likelihood that such a charge would be actually put in effect. The motive for imposing a charge is to get rid of unnecessary application for such receipts.

There was a long discussion in regard to varied and inconsistent practices on the part of the railroads in determining the value of freight which has been lost or damaged. The present standard form of bill of lading stipulates that payment shall be based on the value of the freight at the time and place of shipment; but certain railroads try to reduce

their payments by insisting on the values named in the invoice, though the bill of lading now has no provision for the use of the invoice figures.

The Interstate Commerce Commission is now receiving two or three hundred complaints a month concerning shippers' difficulties in getting satisfactory treatment from the railroads in the matter of valuation of lost or damaged property. Many of these complaints have to do with what are called drop shipments; shipments where there are three parties concerned, the shipper, the jobber who has ordered the goods, and the consignee; the goods being shipped direct to the consignee and the jobber never seeing them. There are three possible bases for the valuation, namely, (a) the shipper's invoice, (b) the date and time of shipment, and (c) the jobber's invoice to the final buyer. Members reported much contention concerning claims on these shipments. It is expected that the new uniform bill of lading which the Interstate Commerce Commission hopes to decide upon and prescribe sometime within the next six months, will clarify this situation; but in the meantime the question is whether the League and the railroads cannot come to some temporary agreement. It was proposed to have a conference with a committee of the Freight Claim Association, but this was rejected as not meeting the situation. The freight claim agents deal only with questions between carriers, and have no authority as to questions between a carrier and a customer.

Many absurd transactions were cited. One railroad, to get at the value of goods at the place and time of shipment, requested the consignor to furnish the names of all of the farmers from which the goods had been bought, with a view to getting figures from each producer!

In the view of a number of members the Cummins amendment has had the effect of restoring the common law, so that the present provision in the bill of lading concerning values is illegal; the common law would require a railroad to pay the consignee's actual loss, regardless of technicalities.

A proposal to ask the Interstate Commerce Commission for a ruling interpreting the valuation clause in the present bill of lading was vigorously opposed, the claim being made that as the present bill of lading form is not in compliance with the law (as the Supreme Court is expected finally to decide) any expression by the commission, even of a temporary nature, may have a wrong influence in connection with the final action to be taken on a permanent bill-of-lading form; but it was finally voted to ask the commission for a conference.

EXPRESS BUSINESS

The committee on this subject reported the recent action of the express companies in asking authority for an increase of 10 per cent in their rates for the transportation of merchandise and expressed the opinion that probably such an increase, to be allowed only during the continuance of the war, would be justified. The express companies, no doubt, will agree to such a time limit and it is expected that there will be a hearing on the subject in December.

Shippers have complained that express companies will not consider a claim from a consignor until he gets a written release from the consignee. This is an annoyance because consignees in such cases frequently will refuse to comply. The committee was instructed to confer with the express companies; and to see that their rules were made public. Members who had gone to the highest officers of the express companies had succeeded in having subordinates soon brought to terms. A number of members narrated varied grievances. In the central west the express companies have returned the money on C. O. D. shipments 30 to 60 days behind time. All members were recommended to send their grievances to the chairman of the express committee, W. H. Chandler, Boston.

MISCELLANEOUS MATTERS

There was a brief discussion on the recent action of the Interstate Commerce Commission in relieving the railroads of some of the former requirements concerning statistical reports; and it was voted to request the commission to continue the requirements for statistics of ton miles, loaded car miles and some other data in relation to certain important commodities, the argument being that these statistics are still kept up by the railroads for their own use, and that therefore the data can be sent to Washington without imposing on the roads an unreasonable burden.

At the banquet of the League at the Waldorf-Astoria on Thursday evening an address was made by Hale Holden, president of the Chicago, Burlington & Quincy, which is reported in another column.

The membership committee reported an increase in the membership of the League during the past year from 360 to 430. Members from Cincinnati, Cleveland, Toledo, Milwaukee and other cities reported on the activities of regional committees and their work in co-operating with the district committees of the American Railway Association. Generally satisfactory conditions in this respect were reported, though in some cases the railroads had complained that the commercial interests were not active enough.

The question of a place for the next meeting was referred to the executive committee. There was a strong sentiment that the League ought to have at least three general meetings every year.

U. S. RAILROAD OFFICERS GOING TO RUSSIA

The personnel of the Russian Railway Service Corps, which has been recruited under the direction of S. M. Felton, director general of railroads, from railroad operating and mechanical officers of the United States, to assist in the operation of the Russian railway system, particularly the Trans-Siberian Railway, has been completed, and the prin-

cipal officers, with their railway and military titles, are as follows:

George H. Emerson, general manager, Great Northern; colonel; George S. Stewart, general superintendent, Great Northern, lieutenant-colonel; R. B. Hawkins, superintendent of motive power, Great Northern, lieutenant-colonel.

Majors: B. O. Johnson, division superintendent, Northern Pacific; Charles M. Winter, division superintendent, Minneapolis, St. Paul & Sault Ste. Marie; Frank R. Blunt, division superintendent; Collins Gravis, division superintendent; Andrew C. Peterson, division superintendent, Chicago, Milwaukee & St. Paul; Charles T. Spear, division superintendent; F. B. Irvine, division superintendent; George W. Tower, division superintendent, Chicago, St. Paul, Minneapolis & Omaha; M. F. McLaren, division superintendent; Samuel T. Cantrell, division superintendent; F. B. Parker, division superintendent; John H. McGlogan, assistant superintendent of telegraph, Great Northern.

Captains: J. C. Benson, master mechanic; John Delancy, master mechanic; James Casey, master mechanic; G. F. Egbers, master mechanic; Northern Pacific; H. A. Enochson, master mechanic, Chicago, St. Paul, Minneapolis & Omaha; Joseph B. Roach, master mechanic; P. G. Baker, master mechanic; W. C. Burel, master mechanic; Frank Buchanan, master mechanic, Chicago, Milwaukee & St. Paul; W. O. Williams, master mechanic; J. C. Climo, master mechanic, Chicago, Burlington, & Quincy, and A. R. McKabe, master mechanic.

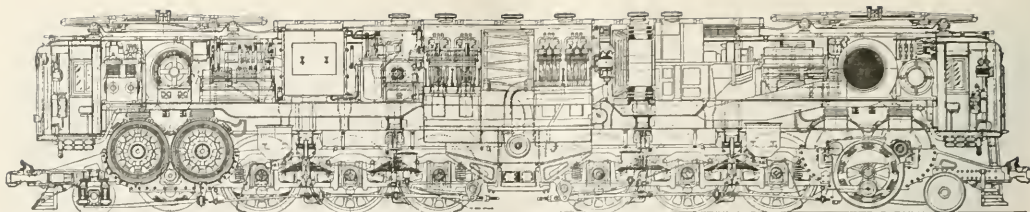
The expedition also includes 24 traveling engineers, 24 trainmasters, 12 chief dispatchers, six boiler foremen and one secretary to general manager, all with the rank of first lieutenant; two secretaries to general superintendent, one secretary to superintendent of motive power, 69 train dispatchers, 3 line repairers, 1 lineman, 20 roundhouse foremen, 2 machine foremen, 3 engine erecting foremen, 4 boiler foremen and 1 foundry foreman, with the rank of second lieutenants.



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Remarkable Photo Showing Destroyed Bridge Blown Up in Russian Retreat Buckling and About to Fall

This remarkable photograph is one of the very few made during the war showing a bridge actually being blown up. The span can be seen buckling under the strain of the explosion, just before it fell, dense clouds of smoke rolled over the structure and water spouts all about showing the effect of the mines planted in the river. Russian engineers mined the river and destroyed the bridge as part of the usual military tactics for delaying a pursuing enemy. They also blew up a neighboring village that had been used as a munition depot to prevent its falling into the hands of the Teutons.



Longitudinal Section of the Locomotive Showing the Arrangement of Apparatus in the Cab.

Pennsylvania Electric Freight Locomotive

Details of Notable Features of the Running Gear Construction and Description of Electrical Equipment

TESTS have recently been made on the Philadelphia-Paoli electrified section of the main line of the Pennsylvania Railroad, of the experimental electric locomotive which has been built for main line freight service by the Pennsylvania Railroad and the Westinghouse Electric & Manufacturing Company. A brief description of this locomotive, including the principal dimensions, was published in the June 8 issue of the *Railway Age Gazette*, page 1199. It is the largest electric locomotive which has so far been built, having a starting tractive effort of 130,000 lb. and a total weight of 240 tons, of which 198 tons is carried on the drivers.

The locomotive has a nominal one hour rating of 4,800 hp. at 20.8 miles an hour, which is equivalent to a tractive effort of approximately 87,000 lb. The continuous rating is 4,000 hp. or 72,000 lb. tractive effort at a speed of 20.85 miles an hour, with the motors connected in parallel. For starting and slow speed operation, "cascade" connection of the two motors on each truck unit is provided. When regenerating at continuous capacity, the locomotive is capable of returning to the trolley system 4,400 hp. at a speed of 21 miles an hour.

In service between Altoona and Johnstown, where it is the intention eventually to use locomotives of this type, it is proposed to operate trains with one locomotive at the head end and one pushing. The continuous capacity at a speed of 20.85 miles an hour enables a trailing load of 2,300 tons to be hauled up a one per cent grade, 4,100 tons up a .5 per cent grade, or 11,000 tons on level track. Two locomotives operating under the proposed plan are expected to handle 3,900 tons westbound, where the ruling grade is 2 per cent, and to handle 6,300 tons eastbound over a ruling grade of 1.33 per cent. The speed chosen is considered to be about the maximum desirable for the operation contemplated and is governed by the size of trains as well as the characteristics of profile and alignment.

In the previous article was given a general description of the construction of the locomotive, but there are a number of features of the locomotive, both mechanical and electrical, which are worthy of more detailed consideration.

The method of securing a rigidly maintained gear center distance may be seen in the illustration showing the flexible jack shaft gear and motor pinions with the casing removed. The jack shaft bearing brass consists of a solid bronze bushing pressed into an eye in the side frame. The removal of this brass involves the removal of the main gear center from the jack shaft. The armature bearings are contained in housings which are fitted into pockets 27 in. wide by 14½ in. deep in the top of the frame casting. These pockets depart from the rectangular in that the sides are tapered 1 in. in 16 in., the housing being forced into the pockets under a pressure sufficient to produce local stresses in excess

of any that will be imposed in service. The housings are then bolted in place both horizontally and vertically. The center distances between the gear and the motor pinions are, therefore, as securely fixed as if all three bearings were in an integral casting.

The active iron of both motor stators on each truck is mounted in a unit motor frame and locomotive cross-tie casting, which also surrounds the jack shaft. The armature bearings are arranged for oil ring lubrication, while the jack shaft is fitted with oil and waste lubrication, a large waste cavity being provided in the side frame casting above the jack shaft bearing.

The body of the jack shaft is 11⅞ in. in diameter with a long taper on each end to receive the gear center. The shaft is hollow, a hole 3 in. in diameter extending through from end to end. The gear center is of cast steel with a long hub which extends through the bearing brass and forms the running surface of the journal. The bore of the gear is tapered throughout its length and fits the taper on the end of the jack shaft. The gear center is pulled home to its seat on the shaft by a heavy nut on the end of the shaft, which is located in a counterbore in the outer face of the gear center. A heavy key in the taper fit insures the proper quarter of the crank pin. The crank pin is 8¼ in. in diameter and has a throw of 30 in. Opposite its center is a lead filled counterbalance with proper angular offset to compensate for transverse unbalance. A complete counterbalance is thus secured for all operating speeds.

The flexible gear is of the Westinghouse type which was developed for railroad service and has previously received wide application both on cars and locomotives. This, however, is the first commercial application in connection with rod drive and no other railroad application approaches it in the amount of power transmitted. The gear has a face 10 in. in width which is a radical departure from previous railroad practice with overhung gearing. This width is made practicable by dividing the gear rim at its midwidth into two rings, independent flexibility being provided for each ring relative to the gear center. The gear pinions are integral and each meshes with both rings, the independent flexibility of which insures an approximately equal division of the maximum load. The pinions and gear rims were manufactured by the R. D. Nuttall Company and are of heat treated steel.

The foundation of the cab structure consists of two built-up Z-shaped girders 26 in. deep, which are spaced 6 ft. 1½ in. apart. To the top of these girders is riveted a cover plate upon which the electrical apparatus is secured. At the mid-length of the cab is a built-in well 15 in. deep by about 3 ft. in width, containing the electrolyte supply from the liquid rheostat, the sides of which are supported from the center girder. To the bottom of this tank is secured the articulat-

ing device, which is of unique construction; in effect it is a link by means of which the inner bumper beams of the two truck units are held in contact, and by means of which all traction stresses are transmitted from the frames of one truck unit to those of the other through the bumper beams, without imposing any stresses upon the cab structure other than those due to its own inertia.

The inner bumper beam of each truck unit is a steel casting of box section, the vertical faces of which are circular arcs with radii equal to the distances from the center of the cab center pin bearing. The two castings are thus in rolling contact with each other as the angularity of the center lines of the two trucks changes, due to track curvature. Supported from the bottom of the electrolyte well by means of pressed steel channels are two steel castings, each of which forms one jaw of a longitudinal pedestal spanning the two bumper beams. This pedestal is closed by a binder generally similar to the usual type of locomotive driving box pedestal binder. The faces of the cast steel jaws are tapered and are covered by long vertical extensions on the binder to which are bolted steel wearing plates. When the locomotive is in operation the inner face of each bumper beam is in sliding contact

A series of taps is used on the main transformer partly to regulate the drop in the secondary voltage of the phase converter through its impedance when operating under heavy loads, and the rise in voltage when regenerating; also to correct the distortion of the phase of the secondary voltage under varying loads. Electro-pneumatically operated unit switches are used to change the various taps on the transformer in such a way as to enable the change to be made from one tap to another without disconnecting the phase converter from the secondary of the transformer, or momentarily short circuiting the transformer coils.

Three-phase power is supplied to each of the four motors through a set of five electro-pneumatically operated unit switches. These motor primary switches are also used as reversing switches. One is used commonly for both forward and reverse operation, and the other four switches are used in pairs to interchange the connection of two of the phases for obtaining forward or reverse rotation of the motors.

The motors are arranged for two-speed combinations, or normal regenerating positions, corresponding to approximately 10 and 20 miles per hour. On the low speed, each pair of motors is connected in cascade; on the high speed,



Pennsylvania Electric Locomotive Hauling an Idle Steam Locomotive and Freight Train

with one of these plates. Both the inner and outer surfaces of the steel bumper beams are protected by steel wearing plates one inch thick, and held in place by countersunk bolts.

The longitudinal cross section of the locomotive shows in detail the arrangement of the apparatus in the cab. Single-phase current at a potential of 11,000 volts is collected by a pantograph trolley, thence following a path through an oil circuit breaker to the primary of the transformer from which it is led to the framework of the locomotive, the circuit being completed through the rails to the substation. The secondary of the transformer supplies power to the phase converter, which may be considered as a combined motor generator, transposing a portion of the power to a phase displacement of 90 deg. from that of the transformer secondary voltage. This, together with the direct supply from the secondary of the transformer, forms a two-phase source of power which is combined by means of a Scott connection to give virtually three-phase energy.

A small single-phase motor which is mounted on the shaft of the phase converter is used in starting to bring the phase converter up to synchronous speed. It is then automatically cut out and used as a direct current generator to excite a winding on the rotor of the phase converter, to obtain a power factor of unity.

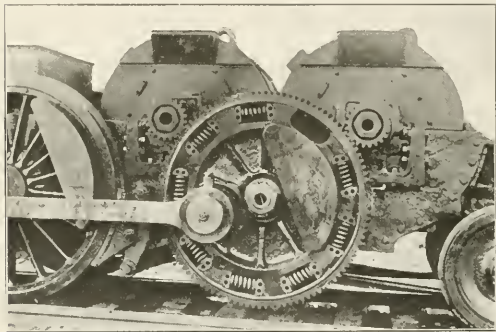
The motor primaries are connected to the three-phase supply in parallel, each secondary being connected to a regulating liquid rheostat. The control is arranged so that the change from one speed to another is made without losing more than half the accelerating or regenerating torque, this result being accomplished by effecting a progressive transition of the pairs of motors.

The liquid rheostats, which govern the acceleration of the driving motors, are located in two separate tanks, the castings of which are built as a part of the cab frame. Each tank contains two sets of electrodes. The liquid is circulated continuously through each of the tanks by centrifugal pumps. The level of the liquid in each tank may be varied independently by means of tubular overflow valves, which are controlled by differential air engines of the Westinghouse PK type. The rheostats are located in the center of the locomotive, one pair at each end of a cooling tower compartment containing two cooling towers. A small percentage of the liquid is by-passed to the top of the cooling towers and flows over the surface of the cooling trays back into the main tank. Air is blown over the trays in a direction opposite to that of the liquid. In this way the body of the electrolyte in the main supply tank is sufficiently cooled by the expenditure of a relatively small amount of energy for

pump operation, and the sacrifice of but a small quantity of electrolyte through evaporation.

When the liquid level in the rheostats has reached its maximum height, which occurs when the overflow valves occupy their uppermost position, a set of switches is automatically closed to short circuit the secondary motor winding and cut out the rheostats. A small motor generator set, the motor of which is of the three-phase induction type, provides a source of direct current for energizing the field of the phase-converter motor when it is operating as a direct-current generator to excite the phase converter motor winding. Power to operate the control circuits and marker lights is also obtained from this set.

One of the illustrations shows the master controller with the case removed. The upper handle, which is designated the "speed" handle, has three positions, one each for the 10 and 20 mile per hour combinations, and one midway between these two which is used as the transition position to enable one pair of motors to be changed over to a new combination without losing the accelerating or regenerating torque of the other pair. The center handle on the master controller controls the acceleration of the locomotive. It has three positions, marked "raise," "hold" and "lower." A movement of the handle to the "raise" position and then back to the "hold" position gives a positive increment of



The Motor and Jack Shaft Mounting

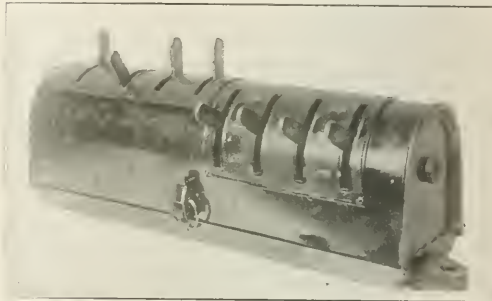
rise in the liquid level of the rheostats. Moving the lever to the lower position and then back to the hold position results in a lowering of the level of the liquid in the rheostats. In this way the speed of the locomotive is controlled during either the cascade or parallel connections.

Overload protection is obtained by a current limit relay. This has the advantage of not opening the circuit, but operates first to arrest the rise of the liquid level in the rheostats and then to lower the level if the accelerating current goes beyond a certain fixed maximum value.

The liquid rheostats may be operated independently of each other by means of levers located in an auxiliary controller. This provides a means of equalizing the load on the different pairs of motors and of reducing the current supply to one pair, without affecting the other pair. Other levers are provided in the auxiliary controller for raising and lowering the trolley, starting and cutting out the phase converter, and operating the phase converter voltage and phase balancing switches.

Due to the inherent characteristics of the induction motor regeneration requires no extra control equipment. Manipulation of the master controller is exactly the same for regeneration as it is for running. The manipulation of this type of locomotive is extremely simple for both running and braking, requiring no special knowledge other than the manipulation of the air brakes when handling heavy trains.

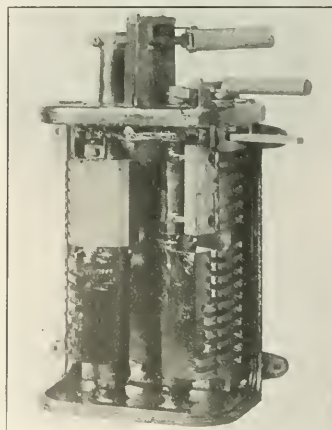
There are two compressor sets on the locomotive, each a four-cylinder, two-stage balanced compressor having a capacity of 150 cu. ft. These are manufactured by the Westinghouse Air Brake Company. The armature of the motor is fitted on the overhung shaft of the compressor. The motor is a Westinghouse four-pole commutator type for alternating current, and at 150 volts on each circuit develops 35 hp. continuous rating at 1,200 r. p. m. By making use of a single-phase commutator motor, the compressor set can be operated independently of the phase converter, the only other apparatus needed being the transformer. This motor has characteristics similar to a series motor and gives a high



The Auxiliary Controller

torque at starting. The compressor sets are controlled automatically by electro-pneumatic governors.

There are two sets of motor driven blowers on the locomotive. These blowers force air through ducts to the main motors, phase converter and main transformer. They are mounted one at each end of the cab. In the event of failure of one set, the air ducts and dampers are so arranged as to



The Master Controller with Case Removed

supply air to all the apparatus in the cab from the other set.

This feature also makes it possible to shut down one blower set while switching, and also to reduce stand-by losses. Although normally operating three-phase, the blower motor will run single-phase and act as a phase converter for the circulating pump motors. After a run, the phase converter may therefore be shut down and the blower motors will continue to run on single phase after having been brought up to speed on three-phase while the phase converter was in operation. This makes possible a further reduction in stand-by losses.

The American Railroads in War Time*

Comprehensive Review of War Board's Problems; Confidence in Ability of Roads to Carry Their Burden

By Hale Holden

President of the Chicago, Burlington & Quincy.

THIS League represents the energy and strength of the industry of the country; it visualizes the output of that industry *in motion* from producer to consumer. Your traffic is at once translated into terms of transportation; into the billions of ton-miles which the railroads of the country manufacture in the vital services they render to you. Modern war finds little by analogy in wars of the past; new terrors, born of the genius of diabolical invention have been met and endured and one by one are being surmounted. The practices of our commercial and industrial life of yesterday are being rapidly readjusted to meet the growing problems of this modern science of wholesale homicide and destruction and we must continue, as we have well begun, to bring our common effort into form best suited to the needs of the hour. Every month since April has added new momentum to this great machine of ours—the power of the American people—and willing co-operation, more than any other force, has brought this about. All of the great war measures, accomplished within a few months, were born of the sound morality of American citizenship, stirred from time to time by the great state papers of the President. . . .

At this point the speaker described the work of the Railroads' War Board in the organization of the railroads for the war. Speaking of the pooling of freight cars he said that approximately 160,000 empty cars had been moved from one line or part of the country to another to relieve shortage or distress, and that this probably had done more than anything else to increase the capacity of the railroad plant as a whole. In his judgment we shall not again return to former methods in this matter. Continuing, he said:

Empty mileage means added expense, and at a time when expenses are almost wholly out of control, it has been hard to incur; when cars for local needs have been scarce and hard to provide, it has been harder upon the individual road and upon the shippers on its line to let them go, but the larger needs of the country as given us by department or committee at Washington or as we have seen them, have governed, and cars ordered to competitor or connection have been delivered as directed without delay.

The Railroads' War Board felt that before calling upon the public to make sacrifices in its normal transportation rights and privileges, the railroads should prove that they had made the first response and as far as the means within their control would permit, had improved their own efficiency. Already, as comparative statistics demonstrate, the most efficient transportation machine in the world, and with lower rates and higher costs of operation, the increase in traffic handled gives ground to hope that thus far we have done our part. Without doubt, much more might have been done and the anxieties of the future point to much that must yet be done, but in passing judgment, you must remember that the life of this machine comes from the human hands that operate it and in the complex conditions about us, these hands sometimes fail us and at times they falter in the struggle with the overload of the plant; you must also remember that months ago, the intense industrial activity of the country, following the recall to Europe of thousands of able men, began to deplete our mechanical and repair forces, and now the problem of proper maintenance of track and equipment

and indeed, of the efficient operation of trains, has become one of the serious anxieties of every railroad officer in the country. . . .

Observing the general increase in efficiency, critics have harshly asked why these things were not done long ago. The answer is that some of these more important measures were adopted knowing that to do them would add instead of decrease expense but were necessary to manufacture more transportation; and the savings accomplished by others have been long since absorbed by the mounting costs of operation. The response of employees and officers under the patriotic cry of the hour, and the magnificent response of the shippers of the country to the same call have had their part; and also the disregard by both shipper and railroad, in the common good, of some of the restrictions which have, in the exercise of the arts of peace, been imposed upon this over-regulated industry.

FUTURE MEASURES

Cold weather is at hand with decreased efficiency of men and power and this, added to the growing scarcity of labor, gives much concern to the outlook for the winter. We have serious problems before us, but I think there is no reason for alarm nor indeed for doubt about the capacity of the railroads to meet the needs of the country. There are some things, however, which must be done to accomplish this and I base my judgment upon the faith that these things will be done.

In the first place, the remarkable results which have come from co-operation show that this co-operation must, at all hazards of differences of opinion or selfish interests, be continued. As difficulties multiply we must meet them by greater co-operation. Let us for the period of the war abolish and bring to an end the old spirit of complaint and criticism. We have in the past been too ready to criticize and to pass harsh judgment upon the motives and actions of each other. This is no time to rattle old skeletons; on the contrary, they ought now to be put well underground, and, if we do this, I think, they will permanently stay there. Organization such as this have done much in recent years toward a better understanding and, I think, the railroad men of the present day are striving earnestly and with unselfish purpose to render the service which the public is entitled to have.

The railroad plant today has definite limitations. It needs more power, but the output of the locomotive plants is going to supply the needs of the Government. We need more cars, but because of the needs of the Government and our allies not as much progress has been made as the traffic needs. We must remember, however, that it was only a little over two years ago that there were approximately 350,000 idle cars reported throughout the country. . . . It is unfair to say, as some have, that the railroads have broken down, because the truth is that they are doing more than ever before. . . . The Priority law accomplishes, legally, a necessary discrimination born of the emergencies of the war. More will have to be done in this direction and some traffic will in time have to be taken off the rails. Already we know that some forms of industrial activity will be curtailed. We can conserve the energies of the railroads, also, by not requiring them during the war to use men or mate-

*Abstract of an address delivered before the National Industrial Traffic League at the Waldorf-Astoria Hotel, New York City, November 15.

rial or train service for unnecessary improvements. The Secretary of War recently wrote to the chairman of the Indiana State Council of Defense, declaring that: "New enterprises which are not fundamental to the efficient operation of the country's necessary activities should not be undertaken." It seems plain that no substantial right nor interest can be seriously affected by the universal adoption at this time of this principle; if it is adopted it will take off the railroads a considerable volume of loading and release many men and cars for more essential work. The reduction of passenger service already has released a great many men for more important work and has accomplished a considerable saving in coal. The passenger travel of the country is heavier than it has ever been before and shows no signs of abatement, and the public may have patiently to submit to further curtailment of passenger service.

We must make greater use of waterways, electric lines and motor trucks, and no better time than the present can be found to make the experiment. There are some stubborn facts, growing out of the big American freight car and the low American freight rate and the industry and team tracks and freight houses located conveniently in every city and town, which, I think, have had more to do with the inactivity of traffic by river or canal in this country than anything else; but in this time of heavy traffic, let us take a new look at the problem and see if some valuable use cannot be made of these natural highways. The War Board has said that the railroads will welcome any practicable water transportation, and they are prepared to co-operate cordially with responsible persons or corporations who may provide such water transportation. This guarantees our interest, I think, in the subject.

In many parts of the country freight is interchanged in considerable volume between steam and electric lines. Locally, electric lines are handling an increasing tonnage. Motor trucks present an admirable means for effecting delivery of package freight to nearby points and as to all of these I am satisfied that the railroads are prepared to join in reasonable measures to develop the use of them.

FACILITIES MUST BE INCREASED AND KEPT IN REPAIR

But we must not stop here, when traffic is rapidly increasing and we see great plants and ship yards being constructed. The railroad facilities of the country must be increased and they must be kept in repair, otherwise they will embarrass and delay us. After a memorable interview with General Joffre, it was not difficult to surrender our space in American locomotive shops in order that the urgent needs of the French might be first supplied; and we did the same for Russia; and naturally the engines, cars and other railroad supplies needed by our own Government for its foreign operations have preceded ours. These things had to be done whether the American railroads could afford to do them or not. After learning from the great marshal the part played by the locomotives of France in the Battle of the Marne, there was but one answer.

We are building railroads in France and engines and cars to operate them, and we must not fail to build whatever is necessary here. To support our operations there, we must not fall behind here. We must have priority for materials and manufacture here, as may be necessary, and the benefit of prices fixed by the Government, and in these, the Government will, without doubt, lend us its aid. We must keep our shops running as now at full time, and competition of other industries must not be permitted to decrease our repair forces nor military service to take more of them than absolutely necessary, lest we may have, as others did, to call them back from the front to do this most important work at home.

Plainly, in these times, the railroads must have more revenues. Railroad expenses nowadays are an open book,

and the predictions made last spring in the effort to obtain timely relief failed only in that the increased cost has greatly exceeded the conservative estimates then made. These things seem to me, however, not difficult to do—and yet the doing of them adequately and in time will likely determine the success of the efforts the railroads are so earnestly putting forth to help win the war. I have faith that all of these things will be done, because the measure of success in this war-time service to the Government will be that we do for it now everything that patriotism and love of country can do.

IOWA COMMISSION APPROVES CURTAILMENT OF TRAIN SERVICE

The Board of Railroad Commissioners of Iowa has given its endorsement of the policy of the railroads in curtailing unnecessary passenger train service during the war, in an opinion reaching the conclusion that the Chicago Great Western should not be required to reinstate two passenger trains in each direction between Cedar Falls and Cedar Falls Junction, Ia., which were discontinued in April. The railroad had formerly operated four trains in each direction between the two points and a complaint regarding the reduction in service was filed by the Cedar Falls Commercial Club and the Iowa State Teachers' College. At the hearing it was shown that one of the trains discontinued during the year ending March 31, 1917, had carried an average of less than 10 passengers for each round trip and that the other had carried an average of about 12 passengers each round trip and that upon the whole service the earnings of the railroad did not equal the expense. There was also a showing that by reason of the discontinuance of the trains the International Harvester Company was unable to reach its patrons with express packages from its distributing plant at Cedar Falls with as much despatch as before and there was some showing that freight did not arrive at and was not taken away from Cedar Falls with the same promptness as before. It was also shown that service was available via the Illinois Central, the Chicago, Rock Island & Pacific, and the Waterloo, Cedar Falls & Northern. The commission says in its opinion:

"We recognize that the service given by the Chicago Great Western Railroad Company prior to the discontinuance of said trains was very convenient for the people of Cedar Falls. We think it would hardly be claimed that it was necessary, and the showing certainly is that the trains were not well patronized.

"In addition to these facts, this commission thinks it should so regulate and control the service to be furnished by railroad companies at this time as to avoid the expenditure of large sums of money either directly or indirectly simply for the convenience of a few people. This country is now at war and the railroads are absolutely necessary to the proper conduct of that war, and where the public safety and public necessity are not manifestly and eminently endangered, we cannot be expected to order the railroads to operate trains where their operation is a mere matter of convenience and not a matter of necessity. The railroads of this state must be permitted and encouraged to use their whole equipment, including their funds, to carry on what is now the supreme business of this country—the business of war—and to facilitate the distribution of food, fuel and other necessities of life. Mere matters of convenience, which are desirable in times of peace and for the purposes of peace, will have to wait until peace comes.

"The application is hereby dismissed."

THE G. T. R. PATRIOTIC ASSOCIATION contributed \$2,000 to the British Red Cross Fund, for which special contributions were raised throughout Canada during October.

The Work of the Army Engineer Corps

The Railway Section, an Important Part of the Corps,
Has Ordered \$70,000,000 Worth of Material to Date

THE Committee on Public Information has given out a statement outlining the work of the corps of engineers of the army during recent months which includes that of the railway section carried out under the direction of S. M. Felton, director general of railways.

The corps of engineers since April 6 has not only been supplying the engineer equipment for an army of a million men, but has undertaken the unprecedented task of furnishing railroads complete from the United States for operation in France. The engineers construct the free arteries through

have been raised as part of the National Army. Seventeen pioneer regiments have been authorized as part of the National Army and are rapidly organizing. National Guard units, equivalent to about 7 regiments, have been called into the federal service, and their reorganization into 17 pioneer engineer regiments for the 17 divisions of National Guard troops is well under way.

Engineer officers' training camps were established in each of the 16 training camp areas, the number of candidates for engineer commissions taken from each camp being 150.



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This British Official Photograph Shows American Railway Engineers at Work on One of the Light Railways Behind the British Front

which flow great armies, reinforcements, supplies and ammunition to the extremities of the lines.

From March 1 to November 1 the corps of engineers increased its personnel from 256 officers on the active list to 394 officers and 14 retired officers on active duty and in addition has commissioned more than 5,000 reserve officers. The enlisted force has expanded from 2,100 to 95,000 and there has also been a heavy increase in civilian employees.

The enlisted strength of the corps on March 1 consisted of 3 engineer regiments of peace or minimum strength and 1 mounted company. On May 15, 4 remaining increments, authorized by the National Defense Act of June 3, 1916, increased the enlisted strength of the Corps of Engineers of the Regular Army to 7 regiments and 2 mounted battalions, all of which have been raised to war strength.

In addition, 9 railroad regiments and 1 forestry regiment

After a month's training in the same camps with candidates for commissions in other branches of the service, the engineer sections were transferred to three engineer training camps with special facilities for technical instruction, one in the vicinity of Washington, D. C., one at Fort Leavenworth, Kan., and one at Vancouver Barracks, Washington. Instruction was continued there for two months. In August, 1,900 candidates were graduated and now hold commissions. Large numbers of engineer graduates of training camps have been assigned to new regiments and special units are being organized and the training of enlisted men in the National Army will be largely under their supervision. A number are in France for special training.

On December 1 about 1,200 engineer reserve officers will be graduated from a second engineer officers' training camp.

A duty imposed upon the engineers has been the purchase of the necessary engineer equipment for more than one mil-

lion men. The Urgent Deficiencies Act, approved June 15, 1917, appropriated for the purpose amounts aggregating in excess of \$130,000,000, an amount comparable with the purchases of material, equipment and supplies for the Panama canal during the ten years of its construction. The Urgent Deficiencies Act, approved October 6, 1917, provides \$198,100,000 additional for engineer purposes, and it is expected that all of this will be expended during the present fiscal year.

In the work for the fiscal year 1916 one officer and 21 civilian employees were engaged in making purchases aggregating \$550,000. On November 1, 1917, the purchasing force had been increased over 1,000 per cent to 52 officers and 193 civilians. All but two of these officers were examined and commissioned in the Reserve Corps after the outbreak of the war.

Within 350 hours after the Engineer Corps, following the declaration of war, advertised for equipment, awards had been made covering the requirements of one million men, a total of 8,700,000 articles, which included among other items four miles of pontoon bridge. Approximately two months was the average time of delivery secured on all of this material.

On September 7, two weeks after receipt of instructions, equipment was en route to the various National Guard and National Army organizations at cantonments throughout the country. These shipments comprised a total of about 48,000,000 lb. in some 64,000 separate cases and packages.

By November 1 the outstanding obligations on orders placed for engineer material, equipment and supplies, aggregated \$130,000,000 and disbursements in payment for material delivered had reached the sum of \$15,000,000 per month. Another important task of the engineers has been to provide efficient methods for the receipt, storage and shipment abroad, with proper accounting system, for this mass of supplies as well as for the vast equipment for field operations and construction work.

This work comprehended the selection, in a short time, of appropriate sites in various cities, the leasing of land, storehouses, piers, railway tracks, and the purchase, when they could not be leased, of such material as locomotive cranes, electric trucks, and similar appliances for freight handling, together with the organization of competent personnel.

THE RAILWAY SECTION

The engineers of the Railway Section have undertaken to transport, and install and put into operation overseas, a complete railroad equipment. The railway problem in the theater of operations in France involves not only the organization, equipment and military training of railroad troops for the construction, maintenance and operation of standard and narrow gage roads necessary for the supply of our armies, but also the purchase, inspection and shipment of immense quantities of railroad equipment, rails, ties, locomotives, cars, shop tools, etc., necessary for the development of adequate port facilities, construction of new lines and their successful operation. The estimate of the situation in France was confirmed by the French Commission, headed by Marshal Joffre, and the means of meeting it have been carried on with intensity. The measures provided respond to the recommendations of the commission of expert railroad men which was sent abroad and reported in detail the transportation conditions that would confront our armies from the ports to the front.

Trained officials in various departments of American railroads were called upon for the officers, and experienced railroad employees for the enlisted men, of the nine railroad regiments, each of 33 officers and approximately 1,100 men. Three regiments were organized for operating rail-

roads, every class of operatives being provided; five regiments were organized for construction, officers being experienced railroad builders and the enlisted men being bridge-men, trackmen, etc., and one regiment was composed of men experienced in the departments of motive power and car repair.

The cost of materials ordered to date is approximately \$70,000,000, including some hundreds of locomotives, more than 100,000 tons of steel rails, more than 3,000 complete turnouts, 500,000 ties, 12,000 freight cars, 600 fill and ballast cars, 600 miles of telephone wire and apparatus, as well as vast quantities of construction and repair equipment.

An organization of engineers was prepared for the construction in France of piers, storehouses, terminal stations, hospitals, cantonments, roads, water supplies, sewage dis-



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American Railway Engineers Preparing for Construction Work on a Light Railway System

posal plants, lighting plants and similar construction. A vast amount of timber and other supplies was purchased and shipping arrangements made. Within four days of the receipt of General Pershing's cablegram asking for certain steel buildings, designs had been prepared, competitive bids secured and orders placed for 30-day delivery. A construction company, contracted with to build wharf structures in France, sent abroad 225 men in August and the necessary material. Preferred attention was given to wharf and storehouse construction, at the request of General Pershing.

The engineers have also undertaken the work of organizing and equipping special troops for special services, such as lumber supply, road construction, sanitary construction, camouflage service, gas and flame service, mining work, mapping, etc.

Preferred attention has been given to the organization and equipment of the first forestry regiment, to be sent to France to produce lumber and timber from French forests. Three additional regiments are to be organized. The co-operation of the forestry service of the Department of Agriculture has been extended in the selection of personnel and equipment. About 80 per cent of the forestry regiment's equipment, value \$350,000, has been delivered for shipment, weighing over 2,000 tons, with 12 saw mills, truck and railway equipment and everything necessary to produce over four million board feet of finished lumber per month.

In addition to all of these duties the Engineer Corps has maintained its regular service in the preservation and improvement of navigable waters in the United States and construction of coast defenses. New batteries are being pushed to completion with energy.



Interstate Commerce Commission, Left to Right—Robert W. Wooley, Winthrop M. Daniels, Charles C. McChord, Edgar E. Clark, Henry C. Hall, Chairman, James S. Harlan, Balthasar H. Meyer, Clyde B. Aitchison and George W. Anderson. Photo from Clinedinst Studio, Washington, D. C.

Proposed Eastern Freight Rate Increase

Arguments Concluded and Case Submitted to Commission—Bankers Testify Regarding Railway Credit

WASHINGTON, November 19, 1917.

THE re-opened fifteen per cent rate case was submitted to the commission on November 19. At the same time George Stuart Patterson, counsel for the eastern roads, announced that as soon as possible the eastern carriers would file applications with the commission asking for another advance of 15 per cent in classes and commodities, except coal, coke and iron ore. As to them the request will be for specific advances of 10 cents a ton.

The hearing of the case took four days—a remarkable record in comparison with any other advanced rate case ever known. On November 15 the executives who had testified on November 5 returned for cross-examination, Messrs. Rea and Elliott being particularly selected for that ordeal at the hands of Clifford Thorne. On the next day the commission listened to Frank A. Vanderlip, president of the National City Bank and Paul Warburg, vice-governor of the Federal Reserve Board, who were called by the commission as experts to tell about the financial condition of the carriers. Their appearance made it necessary to put off the appearance of Clifford Thorne as a witness until the next day. His testimony was supplemented on behalf of the shippers by J. P. Norton, a stock and bond statistician. Thorne used the whole of Saturday and the arguments were put off until Monday, November 19.

The two sides were represented in the final arguments by George Stuart Patterson and Clifford Thorne. Commissioner Anderson, near the close of the arguments, asked them whether, disregarding the railroads' need of revenue to build up their credit with the investing public, the existing rates are high enough to enable the carriers to maintain themselves as going concerns capable of fulfilling their obligations as common carriers under the war strain.

"Absolutely, yes," said Thorne. "And you have no right to allow any advances for any purpose other than maintaining the properties of these carriers and paying the stockholders a reasonable return on their investment."

George Stuart Patterson was equally certain the present rates are not sufficient for that purpose.

"I am as absolutely certain as I am of my physical being, that the present rates are not high enough to maintain these properties," said he.

Throughout the hearing and argument ran the suggestion that the government should make loans to the railroads to buy equipment and extend their terminals. There was no enthusiasm on the part of either railroad men or shippers. The suggestion was made more often by a commissioner than by either party to the controversy. The only man who was strongly in favor of the plan was Benjamin C. Marsh who said he came from New York, as the representative of the American Committee on the High Cost of Living. He put forward government ownership as the panacea. If that could not be had he wanted the rate advances postponed until the valuation of the railroads is completed, so that, as he said, a proper basis for dividend paying and rates could be known.

President Rea admitted that the time had come for seriously considering some plan whereby the government would provide capital but he said that even if the government provided all the cars, locomotives and terminals needed to make an efficient plant the roads would still need more revenue for operations. He said the Pennsylvania is in exceptional financial condition but there are important roads in the eastern district that are in bad shape that are just as important to shippers as carriers in better position. He said the Altoona shops of the company are turning out 22 locomotives a month and in September they had made the record 30. Answering a question by Commissioner Clark, Mr. Rea said that 100,000 cars should be built. A government loan for that purpose would be favored by him if the cars were built on the car trust plan, but on more liberal terms than have yet been devised. Some railroad men, he said, believe that 100,000 cars "pitchforked" into the situation now would make it worse than it is, their contention being that the first need is locomotives.

Commissioner McChord wanted to know what could be done if the government provided the money for the equipment and terminals needed.

"Then the element of time would have to be considered," said Mr. Rea. Mr. Rea admitted the force of Mr. McChord's suggestion that money is not the only element and then followed with his declaration that even if the money was provided for all the additions usually charged to the

capital account, the carriers could not afford to forego their request for higher rates.

"How many cars would you buy if these advances were allowed?" asked Mr. Thorne.

"I can't tell," said Mr. Rea. He added that it is useless to place orders for cars or locomotives without first obtaining a priority of manufacture order because the builders are now working mostly on government account.

Answering a question by J. V. Norman, representing southern hardwood lumbermen, Mr. Rea said that the estimated increase in expenses of the Pennsylvania included war taxes. He thought the roads should be allowed to earn a fair return over war taxes but should not pass all the taxes on to the users of railroads.

Commissioner Clark raised a question as to the propriety of allowing an advance in rates to cover improvements, because, as he suggested, that would be equivalent to making a donation and then having the donors taxed to pay a fair return on the amount.

Howard Elliott was asked, when he took the stand, to point out what, if anything, is wrong in the commission's indictment of the financiering done by the former controllers of the New Haven. Mr. Elliott said that would be a long question and a long answer. He pointed out, however, that the capitalization of the road has been reduced \$12,000,000 since the report was written. Mr. Elliott gave a compilation of the figures showing the investment of the New Haven devoted to freight business to show that the existing rates do not pay the necessary return on investment.

MR. VANDERLIP'S TESTIMONY

"So long as railroads are regulated as to rates, they should have the advantages of the economies of combination," Frank A. Vanderlip, president of the National City Bank of New York, told the commission on November 16, responding to the invitation of the commission to address himself to the general financial situation as it affects railroads. Mr. Vanderlip said he believed regional consolidations of railroads should be permitted. The advance of 15 per cent in rates under consideration at present would, if granted, assist in restoring the willingness of the public to provide the carriers with new capital, said Mr. Vanderlip, but it will not be a cure for what he described as fundamental faults in the railroad situation.

"Before the situation is cured," said Mr. Vanderlip, "we will either go into the hands of the government or we will permit the railroads to consolidate. The railroads can learn something from the experience of the bankers. They have thought too much of their own problems and have not been thinking nationally. I should like to put representatives of the government on their boards of directors, representatives of labor and representatives of the public, after the fashion of the Federal Reserve Bank directorates."

Mr. Vanderlip said that the cure for the railroad problem should come from the commission, but that he had made his suggestions because the mere earnings of the roads do not appear to reflect accurately a situation the chief menace of which is the unwillingness of the public to purchase railroad stocks. He said that the railroads face government ownership unless the public can be convinced that railroad investment is desirable. None of the practical methods of obtaining money for the carriers is open, except at high rates of interest, he said. The roads need a billion dollars a year for improvements and extensions, in his opinion.

Mr. Vanderlip said the stocks of roads prudently constructed and managed should be slightly above par, as a reward for prudence. Commissioner McChord detailed the earnings of the carriers since 1912, indicating generally that these earnings have risen. Mr. Vanderlip said that while these earnings might indicate an increasing prosperity, market quotations of stocks indicated that the public is not satis-

fied with them and asserted that he preferred, as an index to value, the consensus exhibited in stock quotations to tables of expenses and earnings.

"The returns," said Mr. Vanderlip, "appear to indicate that roads are doing well, but investors do not think so."

Returning to fundamental changes which he believes are necessary, Mr. Vanderlip suggested the feasibility of a single corporation owning all the cars in the country. He said that fundamental changes must be made or government ownership lies ahead. He asserted that the railroads are not meeting demands for service and laid emphasis on the fact that service is more important than rates and that the public is willing, except an extremely selfish part of it, to pay for service when it is rendered.

Commissioner McChord asked if the decline of railroad stocks was due to a concerted assault by bankers.

"If you assume bankers have made a wholesale assault upon railroad securities, I deny it," said Mr. Vanderlip. Mr. McChord said that he had received messages at night concerning railroad stocks, but indicated that they had come from brokers. Mr. Vanderlip insisted upon a distinction between bankers and brokers and said that if banks were sending messages about the stock market to a member of the Interstate Commerce Commission at night the attention of the comptroller of the currency ought to be directed to them.

MR. WARBURG'S TESTIMONY

Paul Warburg, of the Federal Reserve Board, who also was invited by the commission to give its members his best judgment about the condition of railroad credit, said that every industry which contributes to the winning of the war should be encouraged and that foremost among those industries are the railroads. Index prices, he said, show an increase of about 100 per cent in wholesale prices since the beginning of the war. Higher interest rates and higher dividends are essential to attract the investing public. The investor is in doubt as to the future of railroads, the quantity of labor available and the price of material. Mr. Warburg said that the public was uncertain about whether the railroads would be dealt with generously.

In seeking an explanation of this statement, Commissioner Woolley said it seemed that the railroad situation was caught in a "vicious circle" if rates must be raised to meet higher wages and higher material prices and raised again as these quantities again advance. Mr. Warburg agreed that this "vicious circle" exists and suggested as a remedy that the government fix the wages of labor as it has fixed the price of materials.

Mr. Warburg said that the sale of railroad securities had become practically impossible and that he thought the roads should be permitted to obtain revenues which would enable them to keep their properties in as good condition as they were at the beginning of the war.

Discussing a suggestion that the railroads conserve their revenues by discontinuing the payment of dividends, Mr. Warburg asserted that such a policy would be fatal to railroad credit and that it would seriously affect the incomes of that large part of the public which owns railroad securities, and upon which the government depends for a large part of its war revenues. Railroad stocks have declined, on an average, about 20 per cent since the beginning of the war, said Mr. Warburg, and this decrease, together with the lessened value of railroad bonds, has brought about a shrinkage in values of about \$2,800,000,000. This is of serious interest to banks which hold about two billions of these securities as collateral for loans.

"Present conditions," said Mr. Warburg, "are such as to demand an increase in railroad revenues."

A desirable situation, he said, would be one in which the proportion of railroad stocks to bonds could be materially

increased, with the stocks quoted sufficiently above par to permit the flotation of new issues as rapidly as they might be required for extension and improvement of the roads. He pointed out that at present there are no new issues of railroad stocks and no market for them.

Mr. Warburg laid stress on the fact that these times are extraordinary, that many ordinary considerations have been waived in the fixing of prices by the government and that the principal consideration under war conditions is to attain results rather than to consider price. If, after the war, the commission finds that the revenues of the roads are too large, they can be reduced, said Mr. Warburg, who, in response to a question by Commissioner Meyer, said that he did not think the public is primarily interested in whether or not the railroads have built up from recent earnings a new equity on which dividends must be earned in the future.

At present, said Mr. Warburg, investors want to buy United States government bonds, exercising a preference that goes beyond the mere question of financial return. This makes more difficult the marketing of railroad securities. He expressed the opinion also that while the government is financing the war, industrial issues should be restricted as much as possible.

George W. Norris, of the federal Farm Loan Board, concluded the session by giving the commission the result of his experience in handling farm loan debentures and other securities, laying stress on the fact that many investors seek their investments because of considerations other than the promised financial return from them.

CLOSING ARGUMENTS

Arguments on November 19 were made in the following order: Mr. George Stuart Patterson for the railroads; C. H. Reynolds for the natural ice shippers of the Pocono hills; Graddy Cary of Louisville for the National Livestock Exchange; Walter E. McCormack for the interior Iowa packers; J. V. Norman for the southern hardwood lumber manufacturers; L. C. Boyle for the National Lumber Manufacturers' Association; C. D. Chamberlin for the independent petroleum refiners; Francis B. James for brick and tile manufacturers; Samuel H. Cowan for the Texas livestock growers; Clifford Thorne for the Iowa livestock men and farmers' grain elevators; B. C. Marsh for the cost of living committee, and Mr. Patterson in closing.

In the closing arguments the rate situation was overshadowed by the question of public policy raised by the suggestion of a government loan. In commenting on that phase the shippers suggested that Congress should deal with it. Chairman Hall asked Mr. Cowan whether he had spoken to Congress about the matter. Mr. Cowan said he had spoken with Senator Newlands and to shippers, and he found a considerable sentiment in favor of the proposal, if it could be shown that the railroads really need help. Mr. Thorne, naturally, both as a witness and as an attorney, said they do not need help; that the surplus accumulated in 1916 and 1917 should be used to meet the emergency. He filed a compilation showing that the surplus laid aside in the two years by the 38 eastern systems was \$147,000,000 in 1916, and \$145,000,000 in the year ended June 30 last. In the former year the dividend amounted to \$117,500,000, and last year to \$126,000,000.

ARGUMENT FOR THE CARRIERS

In concluding his argument for the carriers Mr. Patterson said that the relief granted by the commission earlier in the year amounted to \$97,000,000, and that the rates now under consideration would add \$58,000,000, or a total of \$155,000,000. This, however, would account for only a little more than half of the great rise in wages and materials, which had added \$278,000,000 to the operating costs. Mr. Patterson stated that, as a hearing would have to be had

on the further increases in rates necessary, application would be made by the Eastern carriers for permission to file tariffs making such further increases.

The essential facts of the situation, as recited by Mr. Patterson, were:

1. A continuous decline in net operating income, accompanied by a steadily increasing basis of cost of operation, and this in the face of increasing traffic, property investment, and in average car-load and train-load.

2. A decrease in both the supply and character of labor available for railroad operation, which is being daily intensified, and which will still further increase in the future the cost of operation.

3. The existence of deferred maintenance at a time when the highest standard known should be maintained, the further postponement of which will increase its cost, and decrease the operating efficiency of the railroads.

4. Inability to secure new capital by the issuance of stock, and the necessarily weakening effect upon the credit of the carriers.

5. Inability to make improvements imperatively demanded by the necessities of today and the traffic of the future.

Commenting on the rise in wages, which has already added more than \$100,000,000 to the payrolls of the Eastern carriers, Mr. Patterson said that these advances were still going on, the Pennsylvania Railroad alone having made increases in wages in the past month amounting to more than \$7,000,000 a year.

"As our armies increase into the millions," said Mr. Patterson, "and as the carriers are called upon to meet the competition of labor with industries whose prices are regulated or unregulated, or called upon to meet the competition of labor with the government itself, the available supply of labor will decrease, and its price will rise, and unless the government is prepared not only to conscript labor for the railroads, but also to limit its wage, we must assume that the present cost of labor, measured by wage and efficiency, will not decrease."

Mr. Patterson said that so far as it is humanly possible to look unto the future, there is no immediate prospect of any reduction in the cost of conducting transportation, and the cost of maintaining the railroad properties. He said that the increased cost of coal for locomotives is \$86,000,000 and that the price recently fixed by the government is higher than that now being paid by many of the carriers. The recent increase in wages to the miners would automatically increase the price to the carriers. The estimate of the carriers as to the average increase in the cost of materials other than coal is 42 per cent. Mr. Patterson cited the fact that the government price for pig iron, the products of which are largely consumed by the railroads, is 105 per cent above the average price paid in the five years before the war; that the government price of copper is 68 per cent higher, and the government price for coal 115 per cent above the pre-war level.

Particular emphasis was laid by Mr. Patterson upon the fact that the Eastern carriers are finding it increasingly difficult to provide for the upkeep of their properties. He stated that not only was the cost of labor and materials necessary for maintenance higher than ever before, but it was difficult to get the labor and materials, and this deferred maintenance was becoming a matter of very serious concern.

Mr. Patterson estimated that for the year 1917 the Eastern roads would show a loss of \$81,000,000 in net operating income, despite an increase of \$161,000,000 in total operating revenues. This would be a return on property investment of only 5.2 per cent, or less than the amount which the commission in 1914 found as being lower than demanded in the public interests. He said that the Baltimore & Ohio, without further relief in rates, would not earn its dividends; that the Pennsylvania would have a surplus for the year of only

1.6 per cent on its capital obligations; and that the New York Central would have a surplus of only 1.3 per cent after the payment of dividends.

Mr. Patterson said in conclusion:

"I have not said anything today as to the close and intimate relation which the question of increased rates bears to the successful prosecution of the war. That has been dealt with at length by Mr. Daniel Willard, of the Advisory Commission of the Council of National Defense, and by Mr. Paul Warburg, vice-governor of the Federal Reserve Board, who are far better able than I to speak on that question. They have told you in substance that increased railroad revenues are essential in aiding the government to the successful prosecution of the war. I may, however, say this in conclusion, and I desire to say it with all the earnestness that lies in my power, and to you who are so keen to do the right thing, the inadequacy of the revenues of the carriers has ceased to be a purely economic problem, and is today a vital question of the national defense."

MR. THORNE'S ARGUMENT

Mr. Thorne was very solemn in his argument. He invited the commissioners to consider the situation.

"The statement has been made that during the first year of the war the government will need twenty billions for war purposes," he said. "The income of the people of the United States is about forty billions, possibly more. Just think what that means. One half of every man's income, in one form or another, to be taken for war purposes.

"This is not the time for a combination of business men to come to Washington suggesting the imposition of still further burdens. They say this burden will be for the period of the war only. It is our bitter experience that rates go up but there is never a general reduction. In 1916, with a net \$100,000,000 greater than it had ever been were these railroads suggesting that they might reduce their rates?

"The United States government has already issued seven billions in securities. Last summer you gave these carriers \$100,000,000 additional revenue. Now they are asking for \$58,000,000 more. That is more than five per cent on a billion, in all the interest at five per cent on more than three billions.

"What is the limit of this never-ending cycle of higher costs and higher rates?

"Can these railroads be seriously and respectfully asking for advances because they cannot maintain their properties? Can the New York Central, which earned 15 per cent on its capital stock tell you that it cannot maintain its properties? Can the Pennsylvania be serious in making such an assertion in the face of its surplus of \$30,000,000 for the year ending last June? In the year ending June 30 last these carriers declared dividends amounting to \$126,095,909 and laid aside a surplus of \$145,009,363."

Thorne said there are several courses, other than raising rates, that could be followed, if the railroads were really in a serious condition. One of them is the loaning of money to buy equipment and terminals, to be repaid from earnings.

"Are present rates such as to keep the railroads in such a condition that their stocks would be good for prudent investors?" asked Commissioner Anderson, who had asked that Thorne disregard the question of credit. "Absolutely, yes," said Mr. Thorne. "You have no power to grant advances for anything other than a reasonable return and the proper maintenance of the property. You have no authority to give advances to create a surplus from which betterments and extensions are to be made. The surplus, in theory, is for non-revenue producing improvements, such as stations and grade eliminations."

Mr. Patterson's closing argument was a reiteration of his prior assertions on disputed points and the additional de-

claration that the advances asked in this case, even if granted, will not be enough, on account of the rising costs.

"Then the sky's the limit for rates," suggested Mr. McChord.

"They certainly must go up to meet rising costs," retorted Mr. Patterson.

WILLARD CHAIRMAN OF WAR INDUSTRIES BOARD

Daniel Willard, president of the Baltimore & Ohio, has been appointed by President Wilson as chairman of the War Industries Board of the Council of National Defense, succeeding Frank A. Scott, who resigned recently on account of ill-health. Mr. Willard has been chairman of the Advisory Commission of the Council of National Defense, which position he will retain. The War Industries Board was created to act as a clearing house for the war industry needs of the government, and has to deal with the important problems pertaining to the means and methods of increasing production, the sequence and relative urgency of the needs of the different government services, price factors and the general questions affecting the purchase of commodities, including the industrial and labor aspects of the problems involved. Since Mr. Scott's resignation, Judge Robert S. Lovett, who is a member of the War Industries Board, has been acting as chairman. In a statement regarding Mr. Willard's appointment, Secretary of War Baker, chairman of the Council of National Defense said:

"With the outbreak of the war, Mr. Willard was among the patriotic men who quickly volunteered their services to the government. Since that time he has unselfishly devoted his energies to the work of the Council of National Defense.

"In appointing Mr. Willard to the chairmanship of the War Industries Board the President brings to its activities the services of one who already has familiarized himself, to a large extent, with the task ahead of the board, and likewise has a general knowledge of the relations between industry and the war administration. He is an executive of well established reputation, and his selection was made in the interest of the continued efficiency and usefulness of the War Industries Board. Mr. Willard will enter upon his new duties immediately."

BIG JAPANESE PIER COMPLETED.—The reconstruction of the Yokohama Pier, which has been in progress for the past six years, has been completed. The pier is now 1,200 ft. long and 138 ft. wide, and the depth, alongside, which was formerly only 26 ft. at low water of spring tides, has been increased to 35 ft., providing adequate accommodation for the largest steamers engaged in the Pacific passenger trade. Two large double-storied sheds have been provided.

TRAVELING IN ENGLAND MUST BE ABSOLUTE NECESSITY.—Replying to a deputation from the United Kingdom Commercial Travelers' Association, on October 23, Mr. Wardle said that the difficulties of the railway companies were greater than they were at the beginning of the year. Many more than 500 locomotives had been sent abroad for the purposes of the war, and some thousands were awaiting repairs here, which could not be undertaken owing to scarcity of men and shortage of materials. There had been over 160,000 men released by the railway companies for military service. Although the train services had been considerably reduced a greatly-increased traffic is being dealt with by the companies. The government would be most reluctant to place any further restrictions on traveling by railway, but the ever increasing demands on the railways may make such a step necessary unless the public willingly refrain from using the railways except in cases of absolute necessity.—*The Engineer*, London.



Street Elevation of the Northern Pacific-Great Northern Station.

Terminal Developments at Vancouver, B. C.

New Great Northern-Northern Pacific Station Completed, Canadian Northern Facilities Under Construction

WITH the completion of the Canadian Northern passenger station, upon which work was started recently at Vancouver, B. C., that city will be unusually well supplied with modern passenger terminals. The Canadian Pacific occupies a terminal completed only four years ago, while the Great Northern and the Northern Pacific have only recently commenced running trains into their new station. The newly completed freight and passenger terminal of the Great Northern and the Northern Pacific and the proposed terminal of the Canadian Northern are entirely independent projects so far as ownership, construction or operation are concerned, although the sites are adjacent and the negotiations involved in their acquisition were more or less interdependent. The layouts also bear a striking resemblance.

The new facilities center about False creek, a shallow arm of the Strait of Georgia, in the southeastern part of the city of Vancouver. The original railroad to locate in this vicinity was the Vancouver, Westminster & Yukon, which acquired a right of way on the south side of False creek on which it built a line extending westward across Main street and thence north over a trestle to a terminal fronting on Pender street.

In 1911 the Great Northern as owner of the Vancouver, Victoria & Eastern Railway & Navigation Company, the successor to the Vancouver, Westminster & Yukon, concluded an agreement with the city of Vancouver by which it obtained the title to a U-shaped area around the edges of False creek, east of Main street, leaving a basin in the center about 1,600 ft. wide and 4,500 ft. long that was reserved as public property to be developed as a basin for dock purposes. To fulfill this agreement the railroad was compelled to spend \$2,500,000 for the acquisition of riparian rights from property owners around the basin, in addition it spent considerable sums in purchasing lots to secure the necessary street frontage for terminal development. The filling of the area to permit its use for railroad purposes also involved a large expenditure. Subsequent to the conclusion of this agreement the Great Northern sold a half interest in a portion of the property on the north side of False creek to the Northern Pacific and beginning January 1, 1918, the Northern Pacific will use the Great Northern (V. V. & E.) tracks from Sumas, about 60 miles southeast. The Canadian Northern also operates over these tracks under trackage rights from New Westminster to Vancouver, a distance of 12 miles.

In 1913, after the work on the Great Northern and the

Northern Pacific terminal was well under way, the Canadian Northern, seeking an adequate terminal for its Pacific Coast extension in Vancouver, entered into an agreement with the city whereby it secured title to the basin surrounded by the V. V. & E. property. This made an area of 162 acres of which 127 acres were available for terminal development, the remainder being reserved for a public street and for several small park sites. In addition to filling the area for its own and the city's use, the railroad was required to extend the fill 150 ft. west of Main street to a sea wall which it was also required to construct. This feature of the project entailed an expenditure of \$750,000 for the release of riparian rights. The agreement between the city and the Canadian Northern was founded on a plan of the Vancouver Harbor Commission, contemplating the future construction of a public railroad connecting the two new railway terminals with a public dock, to be located on the Kitsilano Indian Reservation. However, this project has not yet passed beyond the preliminary stages.

THE VANCOUVER, VICTORIA & EASTERN TERMINAL

The Vancouver, Victoria & Eastern terminal plan contemplates the ultimate development of the entire U-shaped area, but the improvements made thus far are restricted to the north side of the "U" with frontage on Park lane and Prior street, except for a locomotive terminal in the extreme southeast angle. The terminal as built provides a new union passenger station and coach yard, separate freight houses for the Great Northern and the Northern Pacific and a joint team yard. Each unit is designed to allow for material extension in the future and space is provided along the north side of the property for tracks to serve possible industries located along Prior street.

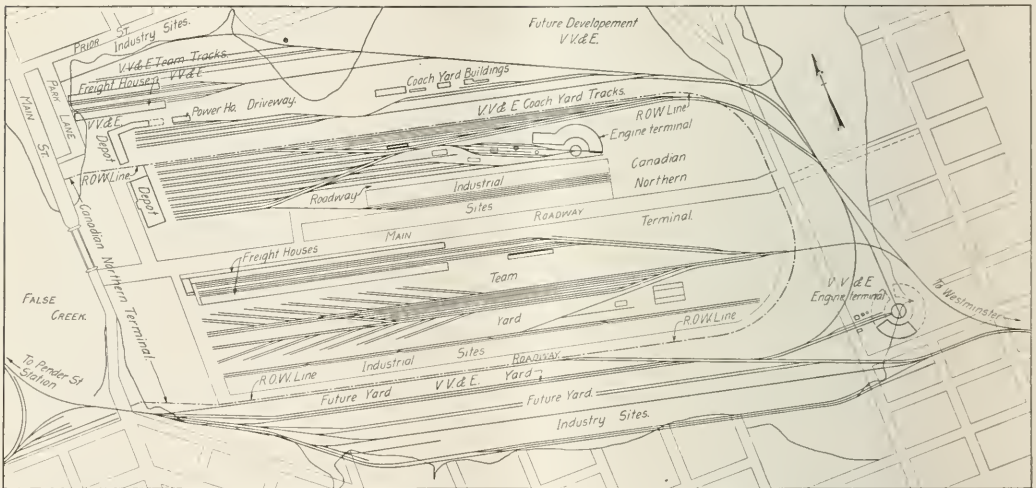
The passenger station occupies the south side of this portion of the property, with two main tracks leading to six station tracks and two coach cleaning and storage tracks. The future development contemplates moving the main tracks further to the south, thereby permitting the addition of five more station tracks and five additional coach yard tracks. The station tracks are arranged in pairs, spaced 12 ft. 6 in. center to center, with platform 20 ft. wide between each pair.

The station building is shaped like an L, the main building being located at the end of the station tracks, while the baggage, express and mail facilities are in a smaller wing alongside the northernmost track. The main building con-

sists of a central portion containing the waiting room 100 ft. by 60 ft., with the auxiliary facilities contained in symmetrical wings on either side. Entrance to the main waiting room is afforded by duplicate doors at each end of the street side, each of which is protected by a suitable marquis. Similar doors directly opposite, in the east wall of the waiting room, lead to the train concourse. The ticket office occupies the center of the east or track side of the waiting room. A woman's rest room and a smoking room together with toilet accommodations are located in the south wing of the building. Behind these is the immigrant waiting room, with a separate corridor leading to the train concourse and a separate street door in the south end of the building. The north wing contains a parcel and news stand, an exhibit room, a stationmaster's office and the checking counter for the baggage room. The main waiting room occupies the full height of the central portion of the building, but the two wings are arranged with second floors that are occupied as local offices by the Great Northern and the Northern Pacific.

The exterior treatment is a red brick above a granite base

minal. They are located on opposite sides of a grid of 6 house tracks, each house having its own driveway on the side opposite the tracks. These houses are 50 ft. wide and 600 ft. long but space is available for an ultimate extension to a maximum of 1,700 ft. A two-story portion at the west end of each of these buildings fronting on Park lane is used for office purposes. The remaining portions of the houses are divided equally into two sections by transverse fire walls, one section serving for bonded freight and the other for free goods. The storage portions of the freight houses have timber roof trusses spaced 22 ft. center to center and spanning the full 50 ft. The entire wall space between columns along the track sides of the storage portions of the freight houses is enclosed by steel roller doors; two to each 22-ft. bay, with windows and wooden sheathing in the space above the doors. The team side has one door 10 ft. wide and 9 ft. high in each bay. The freight house floors are of timber on earth filling, it being the intention to replace these floors with more permanent construction after the filling has had an opportunity to settle. The office portions of the freight houses are of ordinary brick construction with



The False Creek Improvements Showing Present Development of the Vancouver, Victoria & Eastern Terminals and the Ultimate Plan of the Canadian Northern

and a terra cotta dado. Extensive use is also made of terra cotta for the trim. The main waiting room is paneled in Alaskan marble and a cast plaster ceiling. All of the floors in the building are finished with terrazzo tile.

The wing north of the tracks has a width of 42 ft. and a length of 228 ft. Commencing at the west end it is occupied in turn by a baggage room 97 ft. long divided equally between general baggage and bonded baggage, a mail room 48 ft. 6 in. long and two express rooms having a combined length of 81 ft.

The main building has a reinforced concrete frame supporting reinforced concrete floors. The walls are of brick, terra cotta and hollow tile. The longitudinal wing is of ordinary brick wall construction. Owing to the fact that the structure stands on filled ground it was necessary to support it entirely on piles capped with concrete pedestals which carry the system of reinforced concrete girders that support the walls and floors.

THE FREIGHT HOUSES

Duplicate freight houses are provided for the Great Northern and the Northern Pacific, north of the passenger ter-

wooden floors. As in the case of the passenger station the freight houses are supported entirely on pile foundations.

A power plant for heating the terminal buildings is located east of the baggage building. It contains two 125-hp. return tubular boilers with space for a third boiler. The steam pipes for heating the passenger station are conducted through a 6-ft. by 6-ft. pipe tunnel.

As a large part of the area occupied by the terminals was submerged and most of the rest of it was only slightly above tide level, 2,600,000 cu. yd. of filling was required, most of which came from a pit at Sapperton, 10 miles away. A small portion of the material was secured in excavating the cut required to depress the tracks through Grand View, a section of Vancouver southeast of the terminal. The latter project involved eight street viaducts over the track, three of which were steel structures and five timber structures.

Except for a small portion done by the operating department of the Great Northern, the filling was done by A. Guthrie & Co., of St. Paul, Minn., and Portland, Ore., who used two Marion 80-ton steam shovels and 40 Kilbourne & Jacobs air-dump cars of 16-cu. yd. capacity which were operated in trains of 16 cars each. All of the terminal

buildings were built under contract by Grant Smith & Co., and McDonnell, Ltd. Fred L. Townley of Vancouver was the architect. The entire terminal project was under the direction of A. H. Hogeland, chief engineer of the Great

the area not far from the Great Northern station. The plans provide for a building 321 ft. in frontage with a depth of 105 ft. at the head of a group of 16 station tracks. The design of the building is symmetrical, with a waiting room



Train Sheds of the New Union Station

Northern, O. S. Bowen, principal assistant engineer at Seattle, and E. B. Ford, engineer in charge.

THE CANADIAN NORTHERN TERMINAL

The map shows the proposed ultimate development of the Canadian Northern terminal in the basin area of False creek. The filling of the submerged land involved over 5,000,000 cu. yd. of material a large portion of which has been completed. A large sewer has also been constructed

148 ft. by 48 ft. located in the center, supported by wings on either hand containing all the necessary auxiliary facilities. Two upper floors in the wings will accommodate general offices of the railroad, but the central waiting room will have a lofty ceiling extending the full height of the structure. A passenger concourse will occupy the space between the station building and the track platforms. The plans contemplate the use of high grade materials for both interior and exterior treatment, using material originating in



The Main Waiting Room, Northern Pacific-Great Northern Terminal

to drain the terminal property and intercept city sewers which hitherto drained into the basin. The sea wall west of Main street is nearly finished and the outbound freight house, 800 ft. long, has been completed. The contract for the passenger station has been awarded to the Northern Construction Company and Carter, Halls & Aldinger and will be completed early in 1918.

The passenger station is located in the northern half of

British Columbia as far as possible. The estimated cost of the passenger station is \$1,000,000. East of the station tracks the plan provides for a coach yard and passenger engine terminal.

The freight terminal occupies the center of the terminal area with a team yard in the southern portion. The freight house layout consists of an office building 100 ft. by 50 ft. and two freight warehouses,—an inbound freight house 50

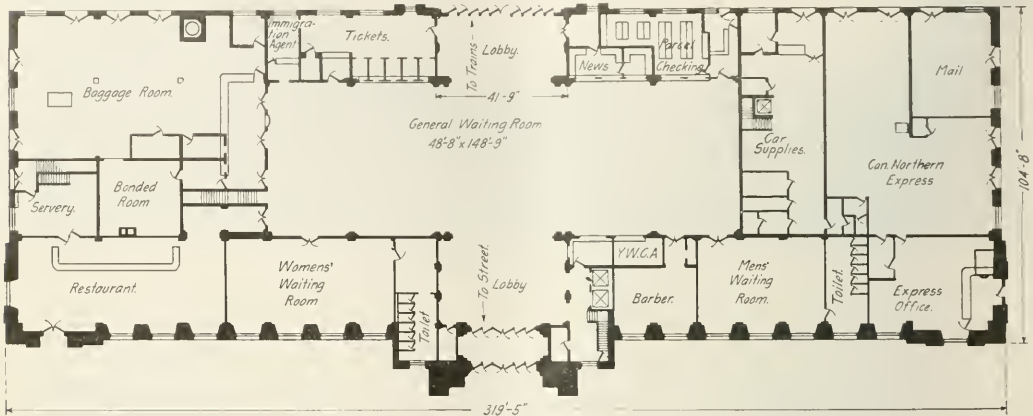
ft. wide and an outbound freight house 40 ft. wide,—with provision for an ultimate length of 1,600 ft. for each house. The freight houses are to be served by six house tracks, arranged in groups of three with a transfer platform in the center.

A section of the outbound freight house, 40 ft. by 800 ft.,

custom's office near the center and accommodations for the clerks and truckers at the west end of the building.

CONSTRUCTION DETAILS

The terminal area required filling to an average depth of 15 ft. The bed of the basin on which this filling was placed

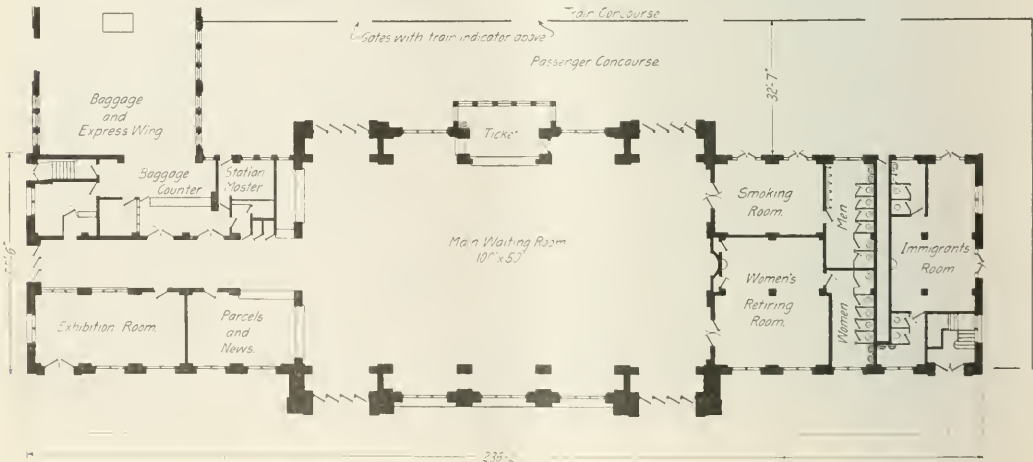


Plan of the Canadian Northern Station

has been completed. This has a steel frame with steel roof trusses supporting wooden purlins which carry a 2 in. plank roof finished with tar and gravel roofing. The floors are of heavy timber construction. Along the track side of the building the doors are continuous, but on the team side they occur only in each alternate 16-ft. bay. Along the entire length of the building above the door head, continuous glazed

consists of a layer of mud and under this a layer of clay, sand and gravel, overlaying hardpan. The two strata varied in thickness but had an average combined depth of about 25 ft. The fill was placed by the hydraulic method with a dredge excavating in False creek west of Main street. The output averaged about 99,000 cu. yd. per month.

The sewer formed an important part of the preliminary



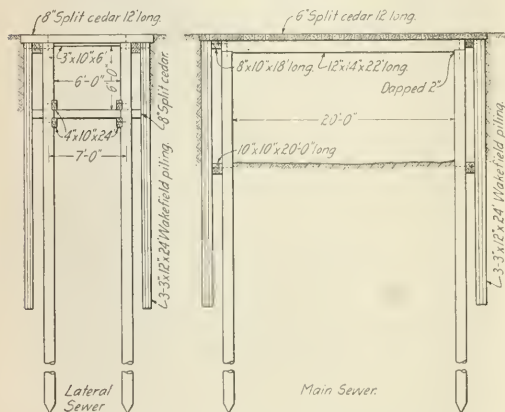
Plan of the New Union Station

transom lights are provided, while the wall portions consist of 7/8-in. sheathing on both sides of the studding, covered on the outside with corrugated iron. Three 13-in. brick fire walls divide the house into four compartments. A cold storage room is located at the east end of the building, a

work. It consists of a main sewer 20 ft. by 18 ft., 4,400 ft. long with laterals of smaller size having an aggregate length of 6,600 ft. Owing to the soft foundation and the presence of the fresh filling material, it was concluded to be unwise to use anything but timber construction for the

sewer, it being the intention to replace this with a more permanent form of construction when the timber sewer requires renewal because of the action of decay or marine borers. The details of the main and lateral sewers are shown in the sketch. The sides consist of Wakefield sheet piling composed of 3-ply, 3-in. by 12-in. timbers with a roof consisting of 6 in. split cedar spanning longitudinally across 12-in. by 14-in. beams supported at intervals of 6 ft. on two rows of piles driven just inside of the sheet piling. The construction of the lateral sewer is somewhat simpler. The roofs of the sewers were left off until they were completed so that they could be cleaned out by means of a clam shell bucket to remove sediment deposited by the return flow of the water from the hydraulic filling. All buildings constructed in the terminal area will be placed on pile foundations, 2,500 piles being required for the passenger station structure alone.

One of the most interesting features of the work is the sea wall west of Main street. This consists of a dock formed by a reinforced concrete slab having a total length of 1,045 ft. This slab is supported along the water side



Section of Canadian Northern Sewers

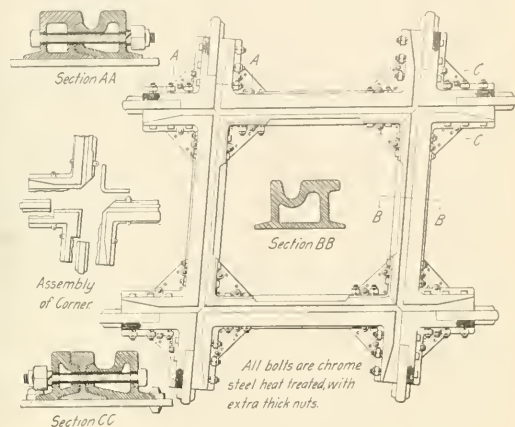
on a longitudinal concrete girder carried on a row of reinforced concrete piles. Along the land-side, the slab is supported on the top of a reinforced concrete retaining wall of the counterfort type. The wall is protected along the water edge by a fender consisting of a heavy timber supported on a row of creosoted piling. The counterfort retaining wall is on timber pile foundation. The construction of this wall entailed the use of 4,800 cu. yd. of concrete, 407,000 lb. of reinforcing steel, 535 concrete piles of a total length of 12,015 ft. and 13,200 lin. ft. of creosoted piles.

The Canadian Northern terminal work at Vancouver is under the general direction of M. H. MacLeod, general manager and chief engineer, Winnipeg, Man., with H. A. Dixon, division engineer, Vancouver, in direct charge. Pratt & Ross of Winnipeg and Vancouver are the architects for all of the buildings. McDonald, Nettleson & Bruce were the contractors for the freight house, A. G. Creelman was the contractor for the sea wall and the Pacific Dredging Company did the hydraulic filling. The sewer work was done by the Canadian Northern Construction Company.

SPECIAL WAR COURSES AT CORNELL.—The College of Civil Engineering of Cornell University is offering six special war courses, two of which are on Military Transportation and Military Construction.

A SECTIONAL MANGANESE CROSSING

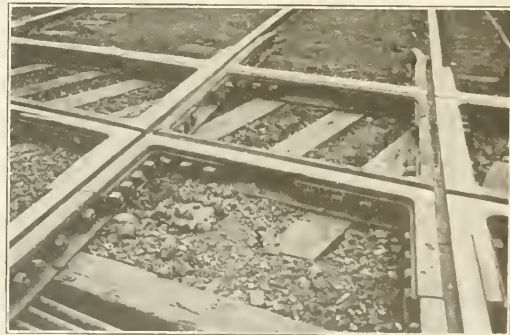
Manganese construction has been used in crossings subjected to heavy traffic for a sufficient length of time to demonstrate the high resistance of this metal to wear and its economy under ordinary conditions. Where difficulty has been encountered it has in nearly all cases been from breakage which usually starts at the intersection of the flange-ways. This difficulty has been recognized in the development of a new design of crossing by Stephen Balkwill, of



Plan and Sections of an Articulated Crossing

the Balkwill Manganese Crossing Company, Cleveland, Ohio, which is manufactured under license by the Pettibone-Mulliken Company, Chicago. This type of crossing is built in eight sections with the joints along its lines of heaviest stress and ultimate breakage in the flange-ways. With this construction the sections are free to move slightly with reference to each other under traffic and the stresses encountered in crossings of solid construction are avoided.

The crossing consists of four side pieces each of which



Crossing of the Erie and Pennsylvania Lines at Cleveland

forms a tread, flange-way and guard rail of one of the four sides of the crossing as well as the guard rails of two of the exterior arms. There are also four corner pieces which form the tread portions of the exterior arms. These eight parts are held in place by bolts with the addition of knees to connect the side sections at the corners. The joints between the four side sections are mitred and terminate in the flange-

way at the groove intersections while the joint between the two parts forming each exterior arm is in the flange-way. The main advantage of this type of crossing is that it allows a certain amount of flexibility at the corners and that, since the joints occur at these points, opportunity for cracks is eliminated. Because of the smaller unit in which the manganese is cast it is possible to secure sounder and more thoroughly treated castings; and the wings are so designed that a rigid connection may be made with the running rails without need for a separate splice bar of any kind.

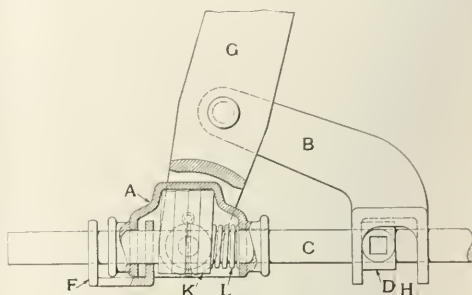
Crossings of this type have been in service at a number of points for intervals up to two and one half years. One of the earliest installations was in the crossing of the New York Central main line and a branch of the Baltimore & Ohio carrying heavy ore and coal traffic at Painesville, Ohio, which has been in the track for more than two years. Based upon the service of this original crossing another one was installed in the New York Central east bound high speed track at the same point about three months ago. A crossing of this type has been in track at the intersection of the Hocking Valley and the Baltimore & Ohio at Fostoria, Ohio, since November, 1916. Others are in service at crossings of the Erie and the Pennsylvania at Cleveland, the Illinois Central and the Chicago & Western Indiana at Chicago, the St. Charles Air Line with the Rock Island and the New York Central at Chicago, the Elgin, Joliet & Eastern and the Chicago, Milwaukee & St. Paul at Spaulding, Ill., and at crossings of the Rock Island with the Santa Fe and the Alton at Joliet.

TRUCK LEVER TYPE SLACK ADJUSTER FOR FREIGHT CARS

A description of an automatic slack adjuster for freight cars which was developed by the Gould Coupler Company, New York, appeared in the *Daily Railway Age Gazette* of June 14, 1916, page 1263. This slack adjuster replaced the push rod in the truck brake rigging, performing the functions of the latter, as well as that of the slack adjuster. The function of the push rod was performed by two members, one

members on the release of the brakes to maintain a constant clearance between the brake shoes and the wheels.

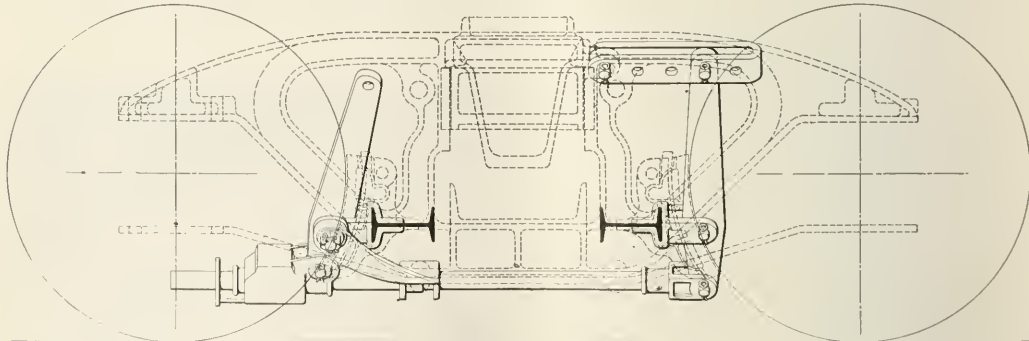
The drawing shows the application of the same principle in a device, since developed by the Gould Coupler Company, which has been materially altered and much simplified in construction. The slack adjuster proper is attached directly to the lower end of the live lever and through it passes the



Details of the Slack Adjuster

push rod which in this case is in one piece. The friction sleeve is mounted directly on the push rod and the adjusting rod employed in the original device has been replaced by an adjusting bracket attached to the live lever at the same location, but provided with a housing at the other end which slides on the push rod and contains the friction clamp.

The operation of the slack adjuster may be made clear by referring to the sectional drawing showing the arrangement of the details. It will be seen that the slack adjuster body A, containing four clamping dogs K is mounted on the push rod C, the lower end of the live lever G being connected directly to the body A. The spring L normally holds the dogs K in an oblique position in which they grip the push rod and prevent any movement of the adjuster along the rod toward the right. The friction clamp sleeve D may be moved along the push rod, but considerable pressure is required to move it.



Universal Truck Lever Type Automatic Slack Adjuster

of which telescoped within the other. In the barrel, or hollow member, was a pocket containing two friction grip dogs through which passed the solid, or push rod member, the normal position of the dogs at an angle of four or five degrees from a line at right angles to the center line of the push rod preventing the latter from telescoping, but permitting its movement freely in the other direction to lengthen the connection between the lower ends of the live and dead levers. An adjusting rod attached to the brake beam, fulcrum pin of the live lever, provided with a friction sleeve operating between two lugs on the side of the barrel member of the slack adjuster, automatically caused the lengthening of the push rod

The device as shown in the drawing is in release position. An application of the brake causes the upper end of live lever G to move to the left, carrying with it its brake beam and brake shoes until the latter bear against the wheel treads. Further movement then causes the push rod C to be moved to the right, applying the brake shoes to the other pair of wheels. The distance H between the friction clamp and the right hand shoulder of the adjusting bracket B is just sufficient to permit the angular movement of the live lever relative to the push rod required to take up the normal amount of clearance between the brake shoes and the wheel treads.

Any increase in this clearance due to brake shoe wear

causes the shoulder of the adjusting bracket to move the friction clamp along the push rod toward the left. On the release of the brake, the parts again assume the position shown in the drawing, the left hand shoulder of the adjusting bracket striking the friction clamp *D* and, if the latter has been moved to the left in the preceding brake application, causing the push rod *C* to move to the right through the slack adjuster jaw by the same amount. The slack will thus be taken up and only a normal amount of movement of the parts will take place at the next application of the air brake.

When the brake shoes are renewed it becomes necessary to let out the slack. To do this, the release handle *F* is first moved to the right, thus unlocking the dogs *K* and permitting the push rod *C* to move to the left. The friction clamp *D* is forced to the right until it strikes the right hand jaw of the adjusting bracket, this operation being repeated until the brake beams are far enough off the wheel to renew the brake shoes. The proper adjustment of brake shoe clearance will automatically be effected on the first application of the brake.

TRAIN ACCIDENTS IN OCTOBER

The following is a list of the most notable train accidents that occurred on the railways of the United States in the month of October, 1917:

Collisions					
Date	Road	Place	Kind of accident	Kind of train	Kil'd Inj'd
8.	N.Y.C. & St.L.	Dunkirk	xc	F. & F.	1 2
8.	Pennsylvania	New Galilee	bc	P. & F.	1 9
17.	Piedmont & N.	Spartanburg	rc	P. & P.	3 43
19.	Cumb. Valley	Winchester	bc	P. & F.	1 1
21.	Southern	Larmond	xc	P. & P.	2 0
28.	Balt. & Ohio	Elsmere	rc	F. & F.	2 0

Derailments					
Date	Road	Place	Cause of derailment	Kind of train	Kil'd Inj'd
3.	Wabash	Toledo	b. rail	P.	0 7
5.	Central Vermont	Williamstown	unx	F.	0 3
11.	Pennsylvania	Horseshoe Curve	d. eq.	F.	0 0
13.	Phil. & Reading	Joanna	unx	P.	1 1
23.	Central Ga.	Sidney	unx	P.	1 3
23.	Chicago & N. W.	Northfield	acc. obst.	P.	2 0
*27.	Kansas C. Sou.	Nederland	unx	F.	0 0
28.	St. Louis S. F.	Brush Creek	unx	F.	0 12
31.	Wabash	Ballou	b. rail	P.	0 17
31.	Central Ga.	Juniper	b. rail	P.	0 34

Other Accidents					
Date	Road	Place	Cause of accident	Kind of train	Kil'd Inj'd
16.	Atchison, T. & S. F.	Orsa, Col.	boiler fire	F.	3 1
*28.	Erie	Kathbone	fire	P.	.. ..

The trains in collision at Dunkirk, N. Y., on the night of the 8th, were a northbound freight of the New York Central and an eastbound freight of the New York, Chicago & St.

Louis. The New York Central engine was ditched and the track of the Pennsylvania Railroad was obstructed. The engineman, fireman, and one brakeman were injured, the brakeman fatally. The New York Central train had approached the crossing at uncontrollable speed, the engineman having evidently misjudged the distance in which he could bring the train to a stop.

The trains in collision on the Pennsylvania Lines at New Galilee, Pa., on the 8th, were eastbound passenger No. 2, the Pennsylvania Limited, and a westbound freight. Both of the engines, the leading car in the passenger train and seven cars in the freight train were badly damaged. One trainman was fatally injured and six employees and three passengers were slightly injured. The freight train was moving westward on the eastbound freight track, under manual block-system regulations; but the signalman at the west end of the block neglected to protect the movement and erroneously set up the interlocking so as to divert the passenger train from the eastbound passenger track to the eastbound freight track.

The trains in collision on the Piedmont & Northern near Spartanburg, S. C., on the evening of the 17th, were a northbound passenger, consisting of three electric cars, and a following worktrain drawn by a steam locomotive. Both trains were crowded with passengers, mostly soldiers from Camp Wadsworth. The electric train had been stopped by reason of some trouble with or failure of the electric current, and, it is said, there were no tail lights displayed. Two civilians and one soldier were killed and 43 persons were injured. One of the killed was riding on the pilot of the engine of the worktrain, this because of the crowded condition of the cars. The engineman of the worktrain was arrested by the military police.

The trains in collision at Winchester, Va., on the night of the 19th, were a southbound passenger and a northbound freight which was switching and which fouled the main track. The locomotive of the passenger train was ditched and the fireman was killed. The engineman was slightly injured. The cause of the collision appears to have been the carelessness of the runner of the freight engine, who

*Abbreviations and marks used in Accident List:

re, Rear collision—bc, Butting collision—xc, Other collisions—b, Broken—d, Defective—unf, Unforeseen obstruction—unx, Unexplained—derail, Open derailing switch—ms, Misplaced switch—acc, obst., Accidental obstruction—malice, Malicious obstruction of track, etc.—boiler, Explosion of locomotive on road—fire, Cars burned while running—P, or Pass., Passenger train—F, or Fr., Freight train (including empty engines, work trains, etc.)—Asterisk, Wreck wholly or partly destroyed by fire—Dagger, One or more passengers killed.



British Official Photograph, Copyright by Underwood & Underwood, N. Y.

Railroad Puts an End to Marching. It Used to Be "Fall In," and Then a Long Weary March to the Trenches. But Now It Is "At Ease" and the Tommies Tumble on the Trains and Are Carried to the Front Lines

said that he thought he was fouling, not the main track, but another one, parallel to it.

The trains in collision at Larmond, Va., on the 21st, were both southbound passenger, a local train on a side track moving toward the main line striking the side of an express train which was passing at full speed. The engineman and fireman of the express were fatally injured.

The train derailed near Toledo, Ohio, on the night of the third, was eastbound passenger No. 58. The engine and first three cars were ditched and 7 passengers were injured. The cause of the derailment was a broken rail.

The train derailed near Williamstown, Vt., on the 5th was a southbound local passenger. One car was overturned and two passengers and one trainman were injured.

The train derailed on the Pennsylvania Railroad at the Horseshoe Curve, near Gallitzin, Pa., on the 11th, was an eastbound freight. The locomotive and 14 loaded cars were wrecked and four main tracks were blocked. The derailment was caused by the spring equalizer between No. 1 and No. 2 driving wheels, right side of engine, interfering with guide yoke bolt.

The train derailed near Joanna, Pa., on the 13th, was a northbound passenger. The locomotive was overturned and the engineman was killed. The fireman was injured.

The train derailed near Sidney, Ga., on the 23rd, was northbound passenger No. 13. While running at about 25 miles an hour the locomotive ran off the track and was overturned, and the engineman was killed. The fireman and two other trainmen were injured.

The train derailed at Northfield, Ill., on the 23rd, was southbound passenger No. 102. The engine was overturned and the smoking car was ditched. The engineman and fireman were killed. The derailment was caused by something on the engine dropping down and catching a road

crossing plank, which plank was carried along to an adjacent switch, wedging in the point of the switch in such a manner as to cause the derailment of the engine and the six following cars.

The train derailed near Nederland, Tex., on the 27th, was southbound freight No. 51. Ten cars in the middle of the train were derailed; seven of them contained oil and the wreck took fire, presumably from friction of metals, and the derailed cars were ruined. The cause of the derailment was not determined; but the train is believed to have been running at excessive speed.

The train derailed at Brush Creek, Mo., on the 28th, was an eastbound special carrying soldiers. Five cars fell down a bank and twelve passengers were injured, none seriously.

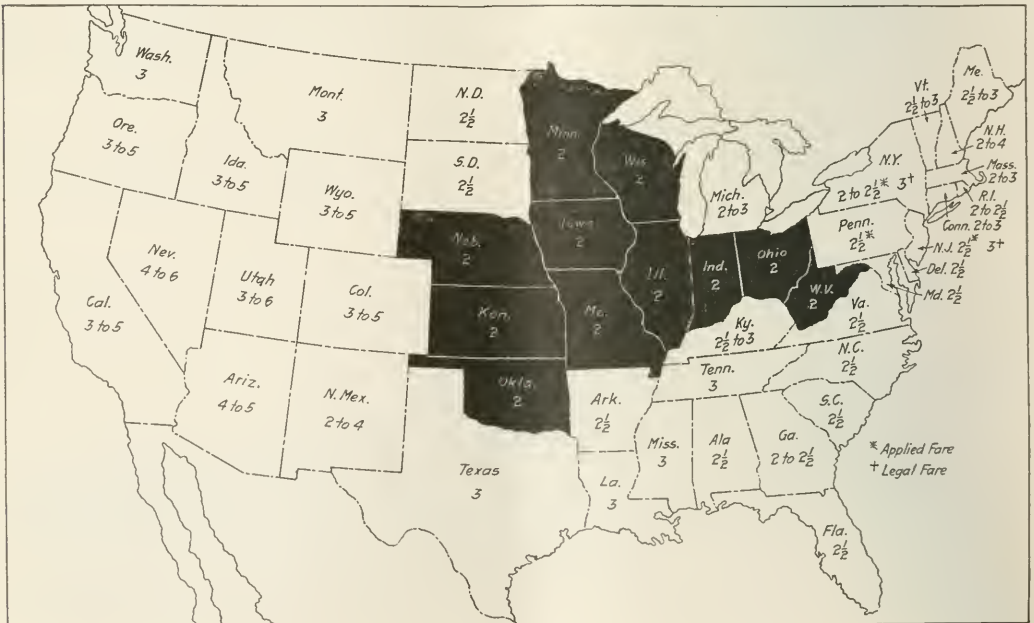
The train derailed near Ballou, Ill., on the 31st, was southbound passenger No. 11. Fifteen passengers and two trainmen were injured. The cause of the derailment was a broken rail.

The train derailed at Juniper, Ga., on the night of the 31st, was eastbound passenger No. 4. Three passenger cars were overturned and 34 passengers were injured. The cause of the derailment was a broken rail.

The train involved in the accident near Orsa, Col., on the 16th, was an eastbound freight. The locomotive was wrecked by the explosion of its boiler. Three employees were killed and one was injured. The cause of the explosion was low water.

The train involved in the accident near Rathbone, N. Y., on the 28th about 3 a. m., was an eastbound special passenger carrying troops. Fire, originating in a cook car, destroyed that car and one sleeping car together with some of the passengers' baggage. The flames spread rapidly and some of the passengers are said to have jumped out of the windows. The loss of property was estimated at \$60,000.

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Slacker States

This map, which was prepared by the American Association of Passenger Traffic Managers at the suggestion of Frank Trumbull, chairman of the Railway Executives Advisory Committee, shows the passenger fares per mile permitted by each state on intrastate business. We have called the area shown in black slacker states; they are putting the burden of unprofitable passenger service on the rest of the country.

General News Department

Employees of the Los Angeles & Salt Lake took second Liberty Loan bonds to the amount of \$146,550.

The Denver & Rio Grande has granted an increase in wages of three cents an hour to machinists, boilermakers, blacksmiths and sheet metal workers employed on its lines in Utah.

Judge Chambers, the government mediator, has been informed that wage differences which threatened a walkout of enginemen and firemen on the New York, New Haven & Hartford have just been referred to arbitration through an agreement reached by the two sides. The management of the St. Louis-San Francisco has notified the railroads' war board of its willingness to meet certain employees for a discussion of grievances over working conditions.

At the Sheephead Bay track, New York City, November 16, Ralph De Palma, driving a Packard automobile, fitted with a Liberty motor, traversed a distance of 633.12 miles in six hours, or at the rate of 105.6 miles an hour. The best preceding record was made at the Brooklands bowl-shaped track in England four years ago: 566 miles in the same time. De Palma traveled 113 miles in the first hour. The Brooklands record was made by three men driving alternately.

The Boston & Maine has made advances of 40 cents a day in the pay of station agents, freight-house men, clerks and other station employees, and of 30 cents a day in that of crossing tenders. These increases were fixed by Henry B. Endicott, arbitrator. The men had asked for 75 cents increase. On their request for an eight-hour day, Mr. Endicott says:

"It was agreed that in view of the present crisis in which this nation finds itself involved at the present time, it is unpatriotic to raise an issue at this time."

The United States Civil Service Commission announces an open competitive examination for telegraph rate experts, for men only. Vacancies in the office of the United States food administrator at \$117 a month and in positions requiring similar qualifications at this or higher, or lower salaries, will be filled from the examination. The duties of appointees will consist of the revision, preparation, audit and payment of telegraph cable accounts. Applicants should apply to the Civil Service Commission, Washington, D. C., at once, for Form 1312, stating the title of the examination desired. Applications must be properly executed, excluding the medical certificate and filed with the commission at Washington prior to the hour of closing business on December 4, 1917.

It is estimated that the saving of meat in dining cars and railroad restaurants by not serving meat on Tuesdays now equals an average of over 85,000 lb. annually or a money value of \$250,000. This estimate is based on reports made by 41 railroads, represented at a recent meeting at Chicago of the American Association of Dining Car Superintendents. "Meatless Tuesdays" and "Wheatless Wednesdays" are being strictly observed now on nearly every railroad. The only possible exception will be the serving of meat on Tuesday to troops in transit. The question of whether that shall be done has been referred by the dining car superintendents to the Federal Food Administration. Some railroads have eliminated roast beef from their bills of fare every day and are serving steaks or beef only at the evening meal. All lines reported that the traveling public has evinced hearty sympathy with the conservation policy.

The United States Civil Service Commission announces examinations for inspector of car equipment, for the valuation division of the Interstate Commerce Commission for duty in the eastern district at entrance salaries not exceeding \$1,500. Future vacancies requiring similar qualifications occurring in any district will be filled from this examination. Applicants must have at least three years' experience in the employ of a railroad in the department of equipment or with a car manufacturing company, or have graduated in mechanical engineer-

ing from a technical school of recognized standing and have had one year of such experience. Competitors will be rated on the following subjects, which will have the relative weight indicated on a scale of 100: Physical ability, 10; experience, 90. Applicants should apply at once to the United States Civil Service Commission, Washington, D. C., for Form 1312, stating the title of the examination desired. Applications, excluding medical certificates, must be filed with the Commission at Washington prior to December 11.

Census of Railroad Employees in Government Service

The Railroads' War Board, for the purpose of obtaining exact information as to the labor situation and of showing what contributions the railroads have made to the public service, has arranged for taking a census of railroad employees in the United States service or of draft age. A circular has been despatched to the railroads with blank forms prepared to show the number of employees who have entered the service of the government, by enlistment, as civilians, or by draft, and those at present in the railway employ who are of draft age. The forms are designed to indicate the character of service and the compilation will embrace all employees. The data which will thus be furnished by the railroads to the war board will not only show the extent of the contribution already made by the roads, but will also give an approximate idea of the extent to which railroad forces are likely to be further depleted and will lay a foundation for the designation of workers when the time arrives for this course to be taken.

Wage Question in Hands of President

The Railroads' War Board, following a conference with W. L. Chambers, chairman of the United States Board of Mediation and Conciliation, on Monday, November 19, regarding the situation created by the wage demands of the Order of Railway Conductors and the Brotherhood of Railroad Trainmen, agreed to place the interests of the railroads in the event of a crisis, unreservedly in the hands of the President for protection and for disposition as he may determine in the public interest. The entire situation was discussed by Judge Chambers and the members of the war board, who reiterated the position taken by the railroads during the eight-hour day controversy, that such matters should be settled by arbitration. They were willing, therefore, to place the entire matter in the hands of the President because of the unusual conditions created by the war, which make it more than ever imperative that there shall be no interruption of traffic. The President was to confer with the officers of the brotherhoods on Thursday. The position of the carriers was stated, after the conference, in a letter to Judge Chambers sent by Chairman Fairfax Harrison to be transmitted to the President. Mr. Harrison's letter is as follows:

"We confirm what we said to you this morning in reply to your inquiry as to what will be the attitude of the railroads with respect to the manner of settlement of any demands for increases in pay or changes in working conditions which during the war may be made upon them by employees.

"Speaking for the railroads today, we reiterate our belief in, and general acceptance of, the principle of arbitration. In the midst of war we are, however, prepared to go further. As no interruption of continual railroad operation can be tolerated under war conditions, we are ready, should any crisis now arise, unreservedly to place our interests in the hands of the President for protection, and for disposition as he may determine is necessary in the public interest."

Judge Chambers expressed the opinion that this action would remove the possibility of a strike, saying that while the brotherhood leaders have been unwilling to agree to arbitration, they have agreed that there shall be no definite action pending the consideration of all facts of the situation by the President and by the Board of Mediation and Conciliation.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF SEPTEMBER, 1917

Average mileage operated.	Name of road.	Operating revenues			Operating expenses			Total.	Operating ratio.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decrease) comp. with prior year.
		Freight.	Passenger.	(Inc. misc.)	Maintenance of way and structures.	Equip- ment.	Traffic.	Trans- portation.					
37	Any. Arher	\$170,738	\$256,254	\$28,115	\$39,692	\$5,875	\$110,309	\$98,949	\$193,968	75.49	\$62,976	\$49,567	-\$16,552
233	Arizona Eastern	196,717	55,185	38,660	38,660	67,964	14,870	166,762	59.41	107,306	13,100	\$9,567	113,922
63	Atlanta & West Point	83,858	59,885	165,740	57,588	14,462	1,933,428	2,768,512	83.62	52,875	33,780	\$19,095	42,927
4,937	Atlanta, Birmingham & Atlantic	9,450,315	2,149,446	12,610,610	1,433,641	2,220,066	185,132	5,603,428	92,852	5,696,567	33,880	\$3,087,804	128,648
31	Baltimore & Ohio	342,559	45,153	23,145	45,153	1,392	136,735	7,292	213,736	65.40	128,792	14,442	39,564
36	Birmingham & Gulf	382,252	4,274	293,976	25,675	32,811	1,183	39,759	7,695	103,151	12,642	18,482	16,152
233	Boston & Maine	93,327	38,791	136,045	39,688	57,993	16,769	81,399	204,580	66.98	130,904	117,498	32,031
237	Canadian Pacific Lines in Maine	1,736	1,736	3,472	1,736	1,111	2,640	5,123	10,845	55.24	8,160	7,500	4,360
973	Carolina, Clinchfield & Ohio of S. C.	6,917,724	2,451,324	10,295,234	1,150,191	1,074,006	138,706	3,195,576	244,218	6,731,819	65.39	3,563,415	2,274,793
63	Chicago, Indianapolis & Louisville	507,862	321,689	805,405	79,403	150,435	24,345	268,400	19,812	534,168	67.44	262,337	77,704
321	Chicago, Milwaukee & St. Paul	134,091	62,482	217,222	28,834	143,790	10,079	270,214	26,719	597,096	59.42	380,508	103,000
1,142	Cincinnati, Ind. & Western	2,155,663	213,563	95,517	6,961	131,319	1,000	30,949	3,850	55,024	41.00	36,423	5,053
86	Colorado & Wyoming	76,319	16,442	92,436	7,630	12,728	22,575	3,088	50,066	52.46	45,370	41,07	13,483
955	Dallas, Fort Worth & Western	3,414,595	933,883	4,256,478	387,588	715,574	72,314	1,789,395	93,172	3,104,966	63.02	1,859,558	1,297,387
2,588	Denver & Rio Grande	1,906,084	507,680	2,385,622	330,869	409,276	40,952	884,669	8,663	1,572,513	81.00	28,687	36,210
335	Denver & Salt Lake	1,737,337	378,005	1,159,332	155,356	21,452	41,328	45,415	3,630	90,447	19,178	16,131	14,290
80	Detroit and Mackinac	127,082	6,773	137,579	2,660	40,909	6,350	162,085	6,976	279,636	104.05	14,591	24,031
190	Detroit & Toledo Shore Line	177,000	56,000	266,752	52,116	52,107	6,350	162,085	6,976	279,636	104.05	14,591	24,031
41	Detroit, Toledo & Ironmont	220,247	16,721	266,941	33,878	44,740	5,276	10,154	10,757	237,303	77.60	17,559	17,559
991	Detroit, Toledo & Saginaw	240,231	210,316	450,547	22,478	21,963	1,076	18,659	10,757	237,303	77.60	17,559	17,559
1,460	Duluth, Winnipeg & Pacific	1,005,591	94,333	1,109,928	113,603	2,716,040	130,994	5,824,043	8,384	999,097	42,301	27,564	207,568
1,087	El Paso & Southwestern Co.	4,624,443	195,347	6,181,140	756,633	1,438,495	203,623	2,716,040	130,994	5,824,043	8,384	999,097	42,301
454	Galveston, Harris & Denver City	357,666	162,140	558,589	38,028	91,138	35,491	535,753	19,633	978,163	54.10	337,324	479,182
1,460	Great Northern	1,609,661	1,232,972	838,072	951,317	951,037	110,781	2,844,470	134,958	5,038,586	60.35	3,333,486	2,656,451
1,037	Gulf & Ship Island	179,462	379,185	1,568,385	264,752	20,425	32,888	64,288	8,399	136,183	57.95	98,812	17,350
402	Houston East & West Texas	177,353	32,424	218,139	23,878	37,022	4,574	63,525	3,117	186,597	60.35	84,312	52,768
90	Houston East & West Texas	119,940	37,351	179,996	80,401	7,749	17,614	236,239	19,479	416,197	53.85	356,709	109,592
1,160	Houston & Texas Central	740,662	354,910	1,155,776	103,894	190,031	23,719	411,043	32,215	759,773	62.57	399,003	20,289
753	International N. Green & Northern	80,915	11,653	97,852	16,705	17,829	4,577	45,532	6,021	90,664	92.65	7,189	11,308
753	Kansas City Southern	853,539	189,605	1,143,975	98,269	175,969	28,345	335,295	31,773	668,022	68.33	472,715	128,109
33	Lehigh & Hudson River	177,151	55,319	194,466	17,323	33,529	6,463	121,654	6,911	74,831	5,600	69,231	25,266
296	Lehigh & New England	337,094	11,138	337,262	64,836	2,627	102,453	9,324	198,358	59.88	132,909	100,159	1,700
1,445	Long Island	4,701,998	51,881	810,530	79,526	207,605	89,801	3,631,365	77.20	102,635	22,181	84,229	20,601
1,153	Long Island	4,701,998	51,881	810,530	79,526	207,605	89,801	3,631,365	77.20	102,635	22,181	84,229	20,601
302	Louisiana & Arkansas	118,509	54,945	245,038	24,038	28,516	7,990	69,280	8,460	149,233	61.51	93,148	23,985
207	Louisiana Ry. & Navigation Co.	214,482	79,046	313,738	18,901	28,516	7,990	69,280	8,460	149,233	61.51	93,148	23,985
1,861	Michigan Central	2,684,440	1,291,433	4,516,101	595,975	638,369	75,613	1,758,345	76,131	3,136,313	71.22	1,299,769	20,000
1,646	Mineral Range	92,847	21,208	99,031	17,531	11,055	18,311	40,664	24,54	724,833	66.56	317,232	43,948
338	Missouri, Kansas & Texas System	2,068,962	1,726,298	3,445,991	19,799	26,233	3,635	60,558	7,182	117,680	73.33	1,003,733	243,729
400	Missouri, La. & Texas R. & S. Co.	420,962	123,345	584,346	60,224	47,578	11,920	166,862	14,412	303,337	51.91	281,008	131,718
165	Nevada Northern	195,730	17,516	216,626	12,231	2,838	2,835	26,915	7,006	70,096	63.32	18,093	39,527
1,911	New York Central	86,467	51,706	217,701	3,590,324	3,012,319	7,693,910	438,078	14,722,831	69.22	5,699,273	5,441,959	1,827,306
6,082	New York Central	12,444,166	5,100,000	17,544,166	3,590,324	3,012,319	7,693,910	438,078	14,722,831	69.22	5,699,273	5,441,959	1,827,306
2,085	Norfolk & Western	427,346	724,627	5,715,694	49,301	98,501	67,990	1,724,462	105,629	3,485,679	69.24	2,274,014	413,000
2,306	Northwestern Pacific	1,947,994	576,362	2,741,862	291,353	269,938	32,000	750,633	32,372	1,415,050	51.61	1,396,811	271,289
2,070	Oregon Short Line	1,450,000	101,001	1,550,241	38,978	95,108	5,048	680,538	80,852	1,337,202	70.79	559,952	127,739
1,207	Oregon-Washington R. & Nw. Co.	1,450,000	101,001	1,550,241	38,978	95,108	5,048	680,538	80,852	1,337,202	70.79	559,952	127,739
1,207	Pittsburgh & Reading	410,183	783,336	5,534,439	426,650	983,266	46,864	2,446,789	92,505	3,908,262	70.62	1,626,177	177,414
205	Pittsburgh & Reading	410,183	783,336	5,534,439	426,650	983,266	46,864	2,446,789	92,505	3,908,262	70.62	1,626,177	177,414
205	Port Reading	191,566	5,927	100,863	1,585	8,544	1,578	46,112	4,659	98,061	106.57	58,638	10,500
221	Port Reading	191,566	5,927	100,863	1,585	8,544	1,578	46,112	4,659	98,061	106.57	58,638	10,500
548	St. Louis, Brownsville & Mexico	187,919	8,223	216,604	4,283	26,312	10,994	7,004	11,371	181,230	61.30	114,396	8,000
143	St. Louis, St. Francis & Terminal	62,696	21,426	90,863	11,196	1,733	4,068	936	7,718	171,281	68.22	98,222	7,516
1,754	St. Louis & Western	1,069,701	335,027	1,487,667	146,738	210,889	45,008	405,992	31,899	625,476	58.21	164,851	4,909
1,251	St. Louis & Western	1,069,701	335,027	1,487,667	146,738	210,889	45,008	405,992	31,899	625,476	58.21	164,851	4,909
3,461	San Antonio and Aransas Pass	1,462,694	801,570	2,495,372	306,246	433,143	72,400	921,538	72,536	1,817,243	72.91	112,500	67,630
3,461	Seaboard	1,462,694	801,570	2,495,372	306,246	433,143	72,400	921,538	72,536	1,817,243	72.91	112,500	67,630

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF SEPTEMBER, 1917—Continued

Average mileage during period.	Name of road.	Operating revenues.			Operating expenses.			Operating ratio.	Net from railway operation.	Railway tax accruals.	Operating income (or loss), last year.	Increase (or decr.) comp. with last year.
		Freight.	Passenger.	Total.	Way and structures.	Maintenance of equip.	Traffic.					
293	Ann Arbor	\$1,790,821	\$413,328	\$2,204,149	\$212,196	\$365,098	\$53,886	\$1,046,039	\$81,602	\$1,763,505	\$75,672	\$25,737
377	Arizona Eastern	2,520,347	467,500	3,000,000	325,563	1,400,590	183,799	4,538,713	39,977	\$87,160	\$19,185	\$1,885,946
60	Atlanta & West Point	2,520,347	467,500	3,000,000	325,563	1,400,590	183,799	4,538,713	39,977	\$87,160	\$19,185	\$1,885,946
240	Atlanta, Birmingham & Atlantic.	2,170,938	470,431	2,641,369	418,523	2,183,369	97,181	2,411,811	84,25	450,906	123,300	386,250
4,675	Balt. & O. of Chicago.	14,016,315	98,641,567	112,657,882	1,123,351	18,659,267	1,758,929	39,992,703	2,439,37	74,064,576	31,253,882	20,900,925
21	Belt Ry. Co. of Chicago.	2,006,285	207,833	2,214,118	408,404	1,770,195	65,628	2,061,456	70,93	84,729	118,258	82,766
3	Bingham & Garfield.	45,000	3,812,028	3,857,028	26,227	5,930	5,930	12,318	1,451	1,451	1,451	1,451
283	Carolina, Chesapeake & Ohio.	2,754,354	216,366	2,970,720	47,642	62,231	11,438	1,225,789	97,29	1,384,459	1,200,000	192,561
17	Carolina, Cincinnati & Ohio of S. C.	13,359	158,852	172,211	15,692	956	3,473	34,973	9,601	84,301	5,400	20,741
9,473	Chicago, Burlington & Quincy.	64,094,418	17,908,138	82,002,556	1,041,246	13,761,042	1,300,277	30,033,089	2,031,185	58,672,059	26,696,984	559,308
654	Chicago, Indianapolis & Louisville.	4,633,444	1,584,930	6,218,374	1,038,894	18,103	2,960,366	1,660,61	4,656,506	2,483,440	333,738	172,408
716	Chicago, Rock Island & Gulf.	16,043,134	62,559,632	78,602,766	1,233,368	23,404,562	1,677,611	46,111,574	75,35	15,348,409	2,831,301	12,498,410
2,386	Chicago, St. Paul, Minn. & Omaha.	20,170,648	15,599,936	35,770,584	1,907,548	2,203,178	257,436	6,545,531	407,466	11,360,765	3,390,374	889,337
374	Chicago, Terre Haute & Southeastern.	2,514,420	159,936	2,674,356	320,048	64,592	41,793	940,516	74,338	2,041,903	72,47	700,150
321	Cincinnati, Ind. & Western.	1,383,683	425,019	1,808,702	248,031	332,753	15,907	515,551	65,15	1,554,501	91,574	297,035
24	Cincinnati, New Orleans & Texas Pacific.	1,601,945	2,140,741	3,742,686	2,401,404	2,801,958	23,362	3,680,038	22,356	1,311,606	419,758	20,913
163	Cleveland, Cincinnati, Chic. & St. Louis.	26,715,772	8,694,407	35,410,179	3,382,930	7,146,609	74,262	15,439,824	780,232	27,728,373	71,43	11,089,080
197	Coal & Coke.	759,274	172,041	931,315	187,954	339,951	10,360	374,749	26,585	838,650	86,37	133,280
1,102	Colorado & Southern.	5,999,617	1,403,939	7,403,556	7,755,161	1,355,588	10,740	2,391,946	238,102	4,890,200	61,59	3,055,940
86	Colorado, Manitowish & Western.	450,400	86,366	536,766	164,440	56,317	27,174	255,106	1,840	567,168	98,26	10,034
87	Cripple Creek & Colorado Springs.	135,885	860,519	996,404	76,807	9,837	11,957	182,775	27,647	437,326	433,192	29,571
163	Cumberland Valley.	2,947,321	324,944	3,272,265	268,044	320,556	41,735	1,151,611	92,762	1,876,567	51,65	1,756,537
879	Delaware & Hudson Co. R. Deit.	18,814,871	2,346,131	21,160,992	1,948,354	4,458,013	23,670	12,310,036	800,260	16,777,86	75,02	5,855,481
275	Delaware, Lackawanna & Western.	1,802,472	3,466,319	5,268,791	559,269	1,963,078	282,886	4,406,207	82,836	14,067,327	67,93	6,011,327
212	Denver & Salt Lake.	6,272,204	1,538,623	7,810,827	1,293,650	41,642	20,582	777,575	44,196	1,555,638	101,11	17,015
385	Detroit & Mackinac.	667,006	254,993	921,999	199,156	210,534	21,798	384,181	35,321	778,469	77,91	220,687
1,301	Detroit & Toledo Shore Line.	1,301,521	1,379,287	2,680,808	72,131	99,511	1,612	430,614	30,707	644,597	47,08	730,190
140	Detroit, Grand Haven & Milwaukee.	1,301,521	1,379,287	2,680,808	72,131	99,511	1,612	430,614	30,707	644,597	47,08	730,190
270	Duluth & Iron Range.	5,683,160	184,791	5,867,951	5,452,402	87,043	68,719	1,450,760	37,513	3,191,652	38,524	2,706
414	Duluth, Missabe & Northern.	10,418,735	298,451	11,117,186	1,338,076	984,968	28,504	2,290,463	147,593	5,031,785	58,48	2,629,517
600	Duluth, South Shore & Atlantic.	2,288,000	795,212	3,083,212	61,010	41,192	61,380	1,376,622	80,051	2,595,518	79,61	664,623
725	Duluth, Winnipeg & Pacific.	1,311,603	214,102	1,525,705	1,898,664	2,929,186	2,410	4,092,466	8,148,183	70,196	447,507	37,489
1,028	El Paso & Southwestern Co.	7,928,088	1,848,255	9,776,343	1,848,255	1,217,399	181,999	2,755,634	264,643	5,440,715	53,87	4,509,156
1,927	El Paso & Southwestern Co.	39,321,429	7,925,668	47,247,097	5,001,549	12,612,032	88,992	23,621,749	1,156,372	43,043,227	83,14	8,718,689
765	Florida East Coast.	3,268,769	2,080,339	5,349,108	598,757	1,743,430	72,005	1,821,013	14,322	3,866,013	52,12	3,019,223
34	Fl. North & Denver City.	317,825	1,171,531	1,489,356	425,911	804,630	65,185	1,327,682	160,249	2,811,062	61,78	1,742,627
145	Galveston, Houston & San Antonio.	10,507,073	3,607,900	14,114,973	1,729,740	1,107,307	2,965	4,448,887	53,636	47,324,34	55,4	3,845,325
314	Georgia.	1,537,147	748,906	2,286,053	247,782	445,548	124,455	1,123,117	82,729	2,022,313	71,77	795,308
404	Georgia, Southern & Florida.	1,207,762	623,100	1,830,862	299,530	472,698	66,769	757,739	83,660	1,860,437	81,16	390,210
573	Grand Rapids & Indiana.	1,305,440	4,935,544	6,240,984	94,042	2,900,961	17,114	3,941,290	79,99	995,384	212,927	778,843
321	Great Northern Western.	11,708,144	64,259,846	75,967,990	9,387,459	8,057,066	987,927	22,476,494	1,116,491	43,747,377	67,06	21,331,069
307	Great & Ship Island.	1,527,974	306,927	1,834,901	233,864	249,142	29,566	496,585	73,707	1,075,104	64,54	590,663
1,937	Gulf, Colorado & Santa Fe.	9,485,598	2,488,472	11,974,070	1,798,448	2,651,515	4,015,700	497,300	8,061,680	71,77	3,501,190	
497	Gulf, Mobile & Northern.	1,385,677	2,335,682	3,721,359	233,332	288,959	33,943	522,518	78,923	1,163,842	67,88	550,298
350	Hocking Valley.	714,731	7,924,149	8,638,880	1,660,394	1,533,781	184,739	5,258,776	66,36	2,665,373	597,000	2,061,654

National Railway Appliances Exhibit

At a meeting of the board of directors of the National Railway Appliances Association on November 12, spaces were awarded to members for the exhibition to be held at the Coliseum and Annex, Chicago, from March 18 to 21, inclusive, of the coming year. A total of 257 out of 267 spaces have been assigned as compared with 226 out of 236 assigned at the same time a year ago, or 31 more spaces. A list of the present members of the association follows:

Adams & Westlake Company, Chicago.
 Adams Motor & Manufacturing Company, Chicago.
 A. G. A. Railway Light & Signal Company, Elizabeth, N. J.
 Ajax Rail Anchor Company, Chicago.
 Alger Supply Company, Chicago
 American Hoist & Derrick Company, St. Paul, Minn.
 American Kron Scale Company, New York.
 American Steel & Wire Company, Chicago.
 American Vulcanized Fibre Company, Wilmington, Del.
 American Valve & Motor Company, Cincinnati, Ohio.
 Armo Iron Culvert & Flume Manufacturers' Ass'n, Middletown, Ohio.
 Associated Manufacturers of Malleable Iron, Cleveland, Ohio.
 Automatic Electric Company, Chicago.
 Ayer & Lord Tie Company, Chicago.
 Asbestos Protected Metal Company, Pittsburgh, Pa.
 Alexander Crossing Company, Clinton, Ill.
 American Auto Connector Company, Cleveland, Ohio.
 Alth-Prouty Company, Danville, Ill.
 Anti-Creep Corporation, New York.
 Barrett Company, The, New York.
 Bethlehem Steel Company, South Bethlehem, Pa.
 Bryant Zinc Company, Chicago.
 Brach Supply Company, Newark, N. J.
 Buda Company, Chicago.
 Baker, John, Jr., Chicago.
 Cambria Steel Company, Philadelphia, Pa.
 Chapman Chemical Engineering Company, New York.
 Chicago Steel Post Company, Chicago.
 Carbic Manufacturing Company, Duluth, Minn.
 Cast Iron Pipe Manufacturers' Ass'n, New York.
 Chicago Bridge & Iron Works, Chicago.
 Chicago Flag & Decorating Company, Chicago.
 Chicago Malleable Castings Company, Chicago.
 Chicago Pneumatic Tool Company, Chicago.
 Chicago Railway Signal & Supply Company, Chicago.
 Cleveland Frog & Crossing Company, Cleveland, Ohio.
 Crear-Adams & Co., Chicago.
 Corning Glass Works, Corning, N. Y.
 D. & A. Post Mold Company, Three Rivers, Mich.
 Detroit Graphite Company, Detroit, Mich.
 Dilworth Potter & Co., Inc., Pittsburgh, Pa.
 Dickinson, Paul, Inc., Chicago.
 Dixon Crucible Company, Jos., Jersey City, N. J.
 Duff Manufacturing Company, Pittsburgh, Pa.
 Dayton Malleable Iron Company, Dayton, Ohio.
 Edison, Inc., Thos. A., Bloomfield, N. J.
 Edison Storage Battery Company, Orange, N. J.
 Electric Railway Improvement Company, Cleveland, Ohio.
 Electric Storage Battery Company, Philadelphia, Pa.
 Elyria Iron & Steel Company, Cleveland, Ohio.
 Eymon Continuous Crossing Company, Marion, Ohio.
 Fairbanks, Morse & Co., Chicago, Ill.
 Fairmont Gas Engine & Railway Motor Car Company, Fairmont, Minn.
 Federal Signal Company, Albany, N. Y.
 Frictionless Rail Company, Boston, Mass.
 General Railway Signal Company, Rochester, N. Y.
 Gurley, W. & L. E., Troy, N. Y.
 General Electric Company, Schenectady, N. Y.
 Gould Storage Battery Company, New York.
 Grip Nut Company, Chicago.
 Graver Tank Works, East Chicago, Ind.
 Hatfield Rail Joint Company, Macon, Ga.
 Hazard Manufacturing Company, Chicago.
 Hayt Roller Bearing Company, Newark, N. J.
 Hall Switch & Signal Company, New York.
 Hayes Track Appliance Company, Richmond, Ind.
 Hoeschel Manufacturing Company, Omaha, Neb.
 Hubbard Manufacturing Company, Pittsburgh, Pa.
 Handlan-Buck Manufacturing Company, St. Louis, Mo.
 Hunt & Co., H. W., Chicago.
 Hagaman Castle Supply Company, New York.
 Ingersoll-Rand Company, New York.
 International Steel Tie Company, Cleveland, Ohio,
 Iowa Gate Company, Cedar Falls, Iowa.
 Johns-Manville Company, H. W., Chicago.
 Jonnison Wright Company, Toledo, Ohio.
 Joyce Cridland Company, Toledo, Ohio.
 Jordan Company, O. F., East Chicago, Ind.
 Julian Beggs Signal Company, Terre Haute, Ind.
 Kalamazoo Railway Supply Company, Kalamazoo, Mich.
 Kenneco Switchboard & Supply Company, Chicago.
 Keppler Glass Constructors Company, Inc., New York.
 Kerite Insulated Wire & Cable Company, New York.
 Keystone Grinder & Manufacturing Company, Pittsburgh, Pa.
 Kelly-Darby Company, Inc., Chicago.
 Kilbourn & Jacobs Manufacturing Company, Columbus, Ohio.
 Kettle River Company, Minneapolis, Minn.
 Kirby Frog & Switch Company, Birmingham, Ala.

Lackawanna Steel Company, Buffalo, N. Y.
 Lane & Bolder, Chicago.
 Lebon Company, The, Chicago.
 Lidgerwood Manufacturing Company, New York.
 Louisiana Red Cypress Company, New Orleans, La.
 Long, Chas. R., Company, Louisville, Ky.
 Lufkin Rule Company, Saginaw, Mich.
 M. W. Supply Company, Philadelphia, Pa.
 Madden Company, The, Chicago.
 MacRae's Blue Book Company, Chicago.
 Massey Company, C. F., Chicago.
 Miller Train Control Corp., Danville, Ill.
 Morden Frog & Crossing Works, Chicago.
 Mudge & Co., Chicago.
 McGraw Hill Publishing Company, New York.
 Marsh & Truman Lumber Company, Chicago.
 Monroe Calculating Machine Company, Chicago.
 Mercury Manufacturing Company, Chicago.
 McComber & Whyte Company, Kenosha, Wis.
 National Carbon Company, Cleveland, Ohio.
 National Lock Washer Company, Newark, N. J.
 National Indicator Company, Long Island, N. Y.
 National Concrete Machinery Company, Madison, Wis.
 National Lead Company, New York.
 National Malleable Castings Company, Cleveland, Ohio.
 Nichols & Bros., G. P., Chicago.
 Northwestern Motor Company, Eau Claire, Wis.
 National Surface Guard Company, Chicago, Ill.
 Ogle Construction Company, Chicago.
 Okronite Company, New York.
 O'Malley Beare Valve Company, Chicago.
 Otley Paint Manufacturing Company, Chicago.
 Post, G. A., New York.
 Patterson, W. W., Company, Pittsburgh, Pa.
 Positive Rail Anchor Company, Marion, Ind.
 Page Woven Wire Fence Company, Monessen, Pa.
 P. & M. Company, Chicago.
 Pocket List of Railway Officials, New York.
 Protective Signal Manufacturing Company, Denver, Colo.
 Pittsburgh-Des Moines Steel Company, Pittsburgh, Pa.
 Polk-Gentue-Polk Company, Chicago.
 Penton Publishing Company, Cleveland, Ohio.
 Q. & C. Company, New York.
 Rail Joint Company, New York.
 Railway Review, Chicago.
 Ramapo Iron Works, Hillburn, N. Y.
 Reading Specialties Company, Reading, Pa.
 R. E. & M. of W. Association, Sterling, Ill.
 Railway Motor Car Company of America, Chicago.
 Railroad Supply Company, The, Chicago.
 Railroad Water & Coal Handling Company, Chicago.
 Roberts & Schaefer Company, Chicago.
 Roos Foundry Company, Henry, Chicago.
 Simmons-Boardman Publishing Company, New York.
 Signal Accessories Company, New York.
 Safe Lock Switch Machine Company, Lexington, Ky.
 Sellers Manufacturing Company, Chicago.
 Snow Construction Company, T. W., Chicago.
 Squire-Cogswell Company, Chicago.
 Simmen Railway Automatic Signal Company, Buffalo, N. Y.
 Southern Pine Association, New Orleans, La.
 Standard Asphalt & Refining Company, Chicago.
 Standard Underground Cable Company, Pittsburgh, Pa.
 Simple Gas Engine Company, Menasha, Wis.
 Silver Steel Tie Company, New York.
 Sperry, H. M., New York.
 Tyler Underground Heating System, Pittsburgh, Pa.
 Templeton, Kenley Company, Chicago.
 Track Specialties Company, New York.
 Toledo Scale Company, Toledo, Ohio.
 Union Switch & Signal Company, Swissvale, Pa.
 U. S. Wind Engine & Pump Company, Batavia, Ill.
 Volkhardt Compn. The, Stapleton, N. Y.
 Verona Tool Works, Pittsburgh, Pa.
 Wayne Oil Tank & Pump Company, Fort Wayne, Ind.
 Wyoming Shovel Works, Wyoming, Pa.
 Waterbury Battery Company, Waterbury, Conn.
 Western Electric Company, New York.
 Wharton, Wm., Jr. & Co., Easton, Pa.
 Whall Company, C. H., Boston, Mass.
 Whittaker-Glossner Company, Portsmouth, Ohio.
 Yale & Towne Manufacturing Company, New York.

American Economic Association

The 30th annual meeting of the American Economic Association will be held with headquarters at the Hotel Adelphi, Philadelphia, Pa., December 27 to December 29. The general topic of the meeting will be War and Reconstruction. At the fourth session: to be held Friday, December 28, at 10 a. m., a paper will be presented on the "Present Valuation of Railroads by the Interstate Commerce Commission" by John Bauer of Princeton University. The paper will be discussed by: A. M. Sakolski, Albany, N. Y.; E. W. Bemis, Chicago; Milo R. Maltbie, New York City, and Charles A. Prouty, Director of Valuation of the Interstate Commerce Commission.

Railway Regiments' Tobacco Fund

Last week was a big week for the Tobacco Fund, subscriptions having been received from 24 supply companies or individuals. The following list brings the names of subscribers up to date at Tuesday noon, November 20:

Bettendorf Company, Bettendorf, Iowa.....	\$10 a month
Cleveland Frog & Crossing Company, Cleveland, Ohio.....	10 a month
Curtain Supply Company, Chicago.....	10 a month
Dearborn Chemical Company, Chicago.....	10 a month
Fairbanks, Morse & Co., Chicago.....	10 a month
Fowler Car Company, Chicago.....	(to cover 2 months) 20
Fort Pitt Malleable Iron Company, Pittsburgh, Pa.....	10 a month
Fort Pitt Spring & Manufacturing Company, Pittsburgh.....	10 a month
Franklin Railway Supply Company, New York.....	(to cover 6 months) 60
Illinois Car & Manufacturing Company, Hammond, Ind.,	(to cover 6 months) 60
Kelly Reamer Company, Cleveland, Ohio.....	(contribution) 10
Keylock Railway Equipment Company, Chicago.....	10 a month
J. E. Meek, New York.....	(to cover 6 months) 60
Miller Train Control Corporation, Staunton, Va.....	10 a month
Pilliod Company, New York.....	10 a month
Pickands, Brown & Co., Chicago.....	(to cover 15 months) 150
Clive Runkle and LeRoy Kramer, of the Pullman Company.....	10 a month
F. K. Shults, New York.....	(contribution) 25
Jos. B. Turbell, of American Brake Shoe & Foundry Company,	New York.....
Templeton, Kenly & Co., Chicago.....	(to cover 6 months) 60
Union Spring & Manufacturing Company, Pittsburgh, Pa.,	(to cover 6 months) 60
H. Vissering & Co., Chicago.....	10 a month
W. H. Woodin, of American Car & Foundry Company, New	York.....
	(to cover 6 months) 60

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations scheduled to meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.
AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. C. Angler, Supt. Timber Preservation, B. & O., Mt. Royal St., Baltimore, Md. Next convention, January 22-24, 1918, Hotel Sherman, Chicago.
CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.
CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.
CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Morrison Hotel, Chicago.
CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 4d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.
CINCINNATI RAILWAY CLUB.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November.
ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 568 Union Arcade Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.
FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Traffic Manager, R. F. & P., Richmond, Va. Next meeting, November 27, Vanderbilt Hotel, New York.
GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.
NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.
NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.
NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Geo. A. J. Hochberg, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.
PACIFIC RAILWAY CLUB.—W. S. Wollner, Assistant to Chief Engineer, Northwestern, 1000 R. St., St. Paul, Minn.
PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.
RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial Annex Hotel, Pittsburgh.
ST. LOUIS RAILWAY CLUB.—W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.
SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 2d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.
TRAFFIC CLUB OF CHICAGO.—C. B. Singer, La Salle Hotel, Chicago.
TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.
WESTERN CANADA RAILWAY CLUB.—J. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.
WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.
WESTERN SOCIETY OF ENGINEERS.—Edgar S. Nethercut, Secretary, 1735 Monmouth Block, Chicago, Ill. Regular meeting, first Monday in month, except January, July and August. Extra meetings generally on other Monday evening except in July and August.

Traffic News

The railroads centering in Philadelphia have not embargoed freight "between all stations less than 40 miles apart" as was erroneously reported in our last issue.

B. G. Hinkley, of Boston, has been named to assist L. A. Sneed, of the United States Fuel Administration, in all matters relating to the supply of coal and coke for New England.

The Railroad Commission of Wisconsin recently authorized an advance of 15 cents a ton on hard coal and coke rates and varying advances for soft coal for different parts of the state. It held a hearing on November 21 to consider additional phases of the soft coal rate situation.

The Southern states can this year not only feed their own live stock but can furnish enormous quantities of feedstuffs to other sections. In addition to cottonseed meal, peanuts and peanut meal the states east of the Mississippi river have a surplus of velvet beans estimated at a million and a half tons. This is a protein feed of high value and particularly valuable as a dairy feed.

A committee of the New York Board of Trade & Transportation, 203 Broadway, New York City, is going to Washington to ask the Shipping Board to take action looking to the construction of boats for use on the enlarged Erie Canal, which will be in condition for use next spring. Members of the committee believe that the construction of boats can be started at once if the Washington authorities will give the necessary assistance.

The Boston & Albany has petitioned the Massachusetts Public Service Commission for authority to advance local passenger fares in that state from 250 cents a mile to 275 cents a mile except in the suburban zone, adjacent to Boston, where the rate is 2 cents a mile. The petition asks also for authority to increase the rate on mileage tickets from 2.25 cents to 2.50 cents; also an increase of 25 per cent on 12-ride and 25-ride tickets.

Among numerous freight embargoes announced this week was one by the Pennsylvania on shipments from any point on the lines east of Pittsburgh, as well as on all freight originating on connecting lines, destined for points on or by way of the Western Pennsylvania Division (the main line and branches from Altoona to Pittsburgh). The embargo will be lifted as soon as conditions warrant, but relief is not now in sight. Government freight, food, coal, etc., are excepted.

Coal to the amount of no less than 80,000 tons has been floated down the Ohio river on a single artificial flood, according to the last reports. This rise was started at Dam No. 7, Ohio river, and augmented by water from the Muskingum, Kanawha and Big Sandy rivers. The coal was taken to Cincinnati and other river cities. Every available towboat and barge was used, even small harbor boats. Fourteen tows of more than 200 craft were in the movement.

The Public Service Commission of Missouri on November 16 authorized a general advance in single trip passenger fares to 2½ cents a mile, from the present rate of 2 cents. The railroad had asked for authority to increase the rate to 3 cents. The rate now prescribed for round trip tickets is 2.4 cents a mile and for mileage books, good for 500 miles, 2.25 cents a mile. The commission allows these rates to go into effect on January 1 next. Commissioner E. J. Bean dissented and Chairman W. G. Busby did not sit in the case.

The New York, New Haven & Hartford has notified the New York Public Service Commission that it contemplates an increase in freight and passenger rates, and requests permission to file the new rates without the usual 30 days' notice. It is proposed to increase all local one way passenger fares from 2½ to 2¾ cents a mile and mileage books from 2¼ to 2½. The zone five-cent fares now prevailing on the Harlem River branch New York to New Rochelle are to be increased from five to six cents a zone. The freight increases (in New York State—no long distances) are from 2½ cents to 7 cents, according to the class.

The subcommittee on fertilizers of the committee on chemicals of the Council of National Defense, noting the embargoes of the Pennsylvania and other roads on the movement of fertilizers (included with other classes of freight quite as important as fertilizer) advises shippers and owners that the embargoes have been made absolutely necessary by the congested condition of the railroads; that all of them are likely to be removed at any time, as soon as the congestion is relieved, and urging that patience be exercised and that no attempt be made to interfere with the orderly working out of the embargoes; but if a given plant is placed in jeopardy of being shut down the facts should be reported to the committee.

The farm tractors which were bought by the Buffalo, Rochester & Pittsburgh last spring for the purpose of assisting the farmers along its line have been kept busy all summer and it is expected that they will continue hard at work until snow flies. These tractors have been furnished to the farmers at a rate of \$1.50 an acre for plowing and 75 cents an acre for harrowing, including the services of an operator and all materials used in operation. They have been of material assistance in helping to produce the million-acre increase in wheat sowed for next season. Many farmers, having witnessed the company's tractors in operation, have been encouraged to make the purchase of tractors of their own. No less than 25 tractors have been bought by farmers along the Buffalo and Rochester divisions since last spring.

The State Public Utilities Commission of Illinois has issued Supplement No. 32 to Illinois Commissioners' Classification No. 10, canceling Supplement No. 31, effective December 15. Additions, cancellations and changes in the classification of articles shown in the new supplement were made by orders of the commission at hearings held at Chicago on May 9, 1917, and September 12, 1917. The commission will meet on the Wednesday after the second Tuesday in the months of January, May and September, for the purpose of considering petitions for further changes in classification or the classification of new articles. All petitions, applications and suggestions of any character to be acted upon at the regular classification meetings must be filed with the secretary of the commission 30 days prior to the first day of such a meeting, and the classification docket will be printed and mailed to all interested parties at least ten days prior to the first day of a meeting.

In order to increase the available supply of gondolas during the winter, the Public Service Commission of Indiana, on its own motion, has modified the existing demurrage rules in so far as they apply to cars containing coal, as follows: On cars placed on public delivery tracks for unloading, 48 hours' free time will be allowed, computing from the time of notice of placement by telephone or messenger. On cars containing coal to be delivered at any other than public delivery tracks, 48 hours' free time will be allowed, computing from the time of actual placement, or from the time of notice by telephone or messenger of constructive placement. In computing free time, Sundays and legal holidays will be excluded and when a legal holiday falls on Sunday the following Monday will be excluded. The average agreement has been abolished as far as cars containing coal are concerned. The order took effect on November 20 and will remain in force for 100 days.

The Adams, American, Southern and Wells Fargo express companies have asked the Interstate Commerce Commission to authorize a general increase of 10 per cent in their rates for transportation of merchandise. They aver that they are carrying on greatly increased business under the most trying conditions, and that their facilities are taxed far beyond their normal capacity. It is increasingly difficult to obtain necessary labor, and because of the increasing demand for express and baggage cars for movement of troops and military supplies it has been impossible to obtain adequate equipment.

Frequent and substantial advances in wages have been necessary to retain the employees, and it has been necessary to hire large numbers of new men to fill the places of those drafted into the army or taken to other employment by higher wages. Present rates do not produce sufficient revenue to meet the actual operating expenses and taxes. Operating expenses and taxes of the four principal companies for the six months ended June 30, 1917, were \$99,653,848, and receipts were \$99,613,999. The deficit for July was estimated at more than \$250,000.

The Boston & Maine has adopted the shipping day plan. On the Boston & Maine the plan has been worked out carefully between the shippers and the management, so that co-operation to secure the maximum of efficiency and satisfaction has been assured in advance. Moreover, in the case of the Boston & Maine the shipping day plan will become effective at all the largest cities on its system.

The Pennsylvania Railroad has this week completed the revision of its method of handling less-than-carload freight, at all stations on its lines in Northern New Jersey. The shipping day plan, which has been already established in New York, Philadelphia, Buffalo and Baltimore, was on Monday put in effect at Trenton, Phillipsburg, Easton, Bristol, New Brunswick and a number of other stations on the New York and New Jersey divisions. Shipping day guides have been prepared for Trenton, Phillipsburg, Easton, Bristol and New Brunswick. For the other stations posters containing specific schedules for each individual station have been issued.

Commuters Show Patriotism

A year ago the State Public Utilities Commission of Illinois received 79 petitions bearing more than 3,000 signatures, requesting a 10-cent fare on the Illinois Central from West Pullman, Ill., to Randolph street, Chicago; also asking for complete electrification of the railroad's suburban lines and the use of modern steel coaches on suburban trains. When the case was called recently a communication from the representative of the petitioners was read as follows: "Because of the war and the expenses under which the railroads are operating, we ask that this case be indefinitely postponed." Accordingly, the case was struck from the docket of the commission.

Coal Production Increased

Not since early in July has the production of bituminous coal reached so high a point as during the week ended November 10, according to the weekly report of the United States Geological Survey. The total output, including coal made into coke, is estimated at 11,300,890 net tons, an average per working day of 1,883,482 tons. This was a gain of 4.7 per cent over the preceding week. Anthracite shipments were reported as 38,775 cars, a figure still far below the level maintained during October. During the week ended November 3, the ratio of tonnage produced to full time capacity was 75.4 per cent, as compared with 74.9 per cent during the preceding week. Losses due to car shortage amounted to 14.5 per cent of the present full time capacity, and labor shortage and mechanical breakdowns were responsible for losses of 5.7 and 3.6 per cent, respectively. A general improvement in car supply was reported in several districts.

County Officers to the Rescue

Governor Whitman, of New York, has notified the County Home Defense committees of the state to see that post-card notices are sent to shippers who are delinquent about obeying the national rules for conservation of transportation. If the delinquent shipper be visited personally by a member of the local committee and the importance of freeing cars as soon as possible made clear to him. It is necessary, says the governor, that the fullest possible use be made of all transportation agencies, including not only the steam railroads, but such other agencies as the motor truck, the electric lines and the waterways. He then quotes the Car Service Commission's suggestions, which include:

To the Receiver of Freight: Purchase in the nearest market. Be prepared to store the full contents of the largest freight car. Bunch your orders so as to make full car-load lots. If you can't order by carload, arrange with others to pool carload shipments.

To the Shipper: Have your shipments ready for immediate loading on receipt of cars. Arrange your shipment in car so as to permit prompt unloading at destination. See that packages are so loaded as to eliminate damage in transit.

Where you have been shipping less than carload freight daily and sending via a transfer point, hold your shipment two or three days to make up full carloads and bill to destination. Use drays or motor trucks instead of "trap-car service" and avoid the use of freight cars for moving freight from one point to another within the same city. Load in a single day, and time your loading to suit the schedule of departing trains. Furnish billing agent full

instructions that will permit the way bill being made up before loading is completed. Consign your shipment to final destination wherever possible, and discourage shipments that require changing destination in transit. Do not bill shipments by circuitous route in order to avoid the effect of embargoes.

Governors of other states have issued similar circulars.

Akron & Boston Express

Automobile trucks, described as "highway freight trains," are now running over country roads, from Akron, Ohio, to Boston, covering 1,510 miles in a week. This truck line is being operated by the Goodyear Tire & Rubber Company. It is called the "Akron & Boston Express." The present equipment consists of two White and two Packard trucks, of 1½, 3 and 5 ton capacity. It is planned to increase the equipment. A regular schedule is maintained, and the cars are said to be usually on time. The schedule calls for the round trip (1,510 miles) in less than one week. It is said that the express companies do not deliver as rapidly as that, and that the truck costs are competing with express rates. Tires are carried eastward and cotton fabrics and machinery on the return trip. Several trips have been made to Washington, D. C., with "war orders."

This service was started last April and the manager hopes to continue through the winter unless stopped by ice and snow. There is only 28 miles of unimproved road on the route. This bothers considerably in muddy weather. The poor condition of some of the old wooden and steel bridges is another handicap. Pneumatic tires are used exclusively.

Committee to Promote Use of Motor Trucks

The possibilities of co-operation with the railroads through greater use of motor trucks and horse-drawn vehicles, for relieving congestion in freight houses and releasing cars in the larger cities, was discussed at the first meeting, on November 17, at Washington, of the newly appointed Highways Transport Committee of the Council of National Defense. The great utility of motor trucks for carrying freight short distances, and keeping certain classes of freight out of the railroad terminals, will be a matter for recommendations by the committee. The committee will also act towards eliminating waiting time of trucks and drays at terminals. The committee will not operate any motor transportation, but, though co-operation with other transportation agencies, seek to develop the possibilities of the motor truck for carrying freight over distances where it can prove its economy and helpfulness in the present emergency. The committee appointed as secretary R. C. Hargreaves, who for some time past has been doing preliminary work on this subject under the Storage Committee of the Council of National Defense.

An example of the co-operation of manufacturers with the Washington committee is found in a large display advertisement printed in a New York paper and paid for by the Autocar Company, Ardmore, Pa., which reads, in part, as follows:

CLEAR THE WAY!

America's railroads are doing wonderful work, but they need help. Freight cars must be unloaded and terminals cleared. If it is your job, speed up loading and unloading of cars on private sidings. Do not be a slacker by trying to save expense of labor or space by using freight cars as storage houses. If your merchandise is congested at the terminals and you have not sufficient teams or motor trucks to move the goods at once, buy them or hire public ones. If you can't do this, do something else—ask your neighbor to help you. Why hesitate to hire your neighbors' trucking facilities? We must pull together. Shipping departments throughout the country demand the personal consideration of executives . . . Plan to reach nearby points by motor trucks, teams or waterways—save the railroad terminals. Twenty-five per cent of case, barrel and package merchandise can be delivered in this way. If the railroads decide to reserve certain terminals exclusively for Government materials, do not grumble, but go the extra distance and haul your goods to or from other terminals. It may be necessary to have a National terminal clearing day. If we have such a day, keep your teams and motor trucks going and keep your receiving departments open continuously 24 or 48 hours, if need be, and give the railroads a chance to catch up. Let everybody be prepared some way, somehow, to move their merchandise away from the terminals immediately.

Commission and Court News

STATE COMMISSIONS

Authority of a Commission to Raise Fares

The Public Service Commission of New York, second district, has authorized an advance of one cent—five cents to six cents—in the rate of fare on the Huntington Railroad Company, a street railroad running between Huntington Harbor and Amityville on Long Island. It was one of numerous six-cent fare cases, so called. No community through which the road runs objected to the applicant's case on the facts, nor did any of the inhabitants. The commission holds that subdivision 1 of section 49 of the public service commissions law (of 1907) has made it the duty of the commission, where it finds upon a sufficient showing that the maximum rates chargeable either under the railroad law or under the local franchise are insufficient to yield reasonable compensation, and are for that reason unjust and unreasonable, to authorize an increase. The opinion cites all of the decisions and all of the statutes of the State of New York having any bearing upon the question, and follows the Court of Appeals in the *Ulster & Delaware* case (218 N. Y., 643) and the Appellate Division for the Third Department in the *New York & North Shore* case (175 App. Div., 869).

COURT NEWS

The United States Bureau of Labor Statistics, Washington, has issued Bulletin No. 224, containing reports of important court decisions on labor questions issued since January 1, 1916. A number of the decisions of the Supreme Court of the United States, handed down since December, 1916, are included, but for the most part the decisions were made in the calendar year 1916. The most notable decisions are those sustaining the constitutionality of the Adamson eight-hour law, so-called; those deciding the constitutionality of workmen's compensation laws; and that sustaining the Oregon ten-hour day for factory employees without regard to sex or age. Besides these decisions of the Supreme Court there is the decision of the court of last resort of the state of Massachusetts in declaring unconstitutional an act of that state which undertook to limit the issue of injunctions in labor disputes, and numerous decisions and rulings by the state courts on questions of construction and constitutionality.

A large number of the decisions deal with the Federal liability law covering railroads in interstate commerce. Not only must the employing company be an interstate carrier, but the injured person must at the time of his injury have been employed in interstate commerce; for it is only when he is so employed that he can claim the benefits of the act, while, on the other hand, if so employed he is restricted to such recovery as that statute provides. With the wide extension of compensation legislation (now found in 37 states), there is constant conflict between the two classes of remedy, i. e., by compensation and by suits for damages; and it is frequently impossible to determine whether relief should be sought under the one law or under the other until the evidence has been submitted to a jury and a verdict rendered.

Evidence as to Notice of Flood

In an action for the destruction of a car of screens by fire from a car of unslaked lime fired in a railroad yard in Troy, N. Y., by an unprecedented flood, exceptions were taken to certain evidence introduced to show notice to the railroad of the coming of the flood. The Vermont Supreme Court held that parts of an article in a daily newspaper, published in a nearby city (Albany), to the effect that the river would rise nearly 16 feet (at Albany), and that it would continue to rise, and stating the weather observer's forecast, and the basis thereof, was inadmissible to show what information was accessible to the railroad as bearing on the question whether it ought to have known or to have inquired as to flood conditions in order to have protected the property, without a showing that the article had been seen and read by

some of the railroad's agents. Such an article did not in law have the effect of constructive notice, and at most could be only actual notice. Testimony of the weather forecaster concerning his daily weather maps mailed to public places, or his telephone messages to newspapers and to business houses, was held to afford no reasonable inference as to the railroad's negligence, and its admission was harmful error, especially in view of the railroad's custom of telephoning to the weather bureau for information as to flood probabilities. Judgment for the plaintiff was reversed and a new trial ordered.—*Porter Screen Mfg. Company v. Central Vermont (Vt.)*, 102 Atl., 44. Decided October 2, 1917.

In another action for the destruction of a carload of paper at the same time from the same cause the New York Appellate Division arrived at the same conclusion.—*International Paper Co. v. New York Central*, 166 N. Y. Supp., 751. Decided July 19, 1917.

Freight Classification

The South Carolina Supreme Court holds that under the rule of the Interstate Commerce Commission, making the rate on scrap iron apply only to scraps and pieces of iron and steel which cannot be again used for the purposes for which they were originally used, a shipper of partially burned gasoline engines to the factory for the purpose of rebuilding is not entitled to the scrap iron rate, though the engines cannot be profitably rebuilt.—*Gibbes Machinery Co. v. Southern (S. Car.)*, 93 S. E. Decided September 28, 1917.

Necessity for Physical Connection Between Crossing Tracks

Application was made by the Akron, Canton & Youngstown to the Ohio Public Utilities Commission for an order requiring that its tracks and those of the Cleveland, Akron & Cincinnati be connected at a certain point in Akron. The application was denied and the applicant appealed. The Ohio Supreme Court holds that the laws do not absolutely require such a physical connection. The test to be applied in every case is that of practicability of construction and reasonable necessity. Jurisdiction over such matters has been conferred upon the state Public Utilities Commission, and it is authorized to require such connection where, upon hearing, it finds it to be practicable and reasonably necessary. A charge of unjust discrimination is not made out by the mere fact of a previous connection with the tracks of one company and a refusal to another company. Reasonable public necessity for the proposed connection is the ultimate test in every case. In the present case the action of the commission in dismissing the application was sustained.—*Akron, C. & Y. v. Public Utilities Commission (Ohio)*, 117 N. E., 314. Decided June 26, 1917.

In another case application by the Wheeling & Lake Erie for physical connection with the tracks of the Lake Erie & Pittsburgh near Kent, where the two tracks crossed at different grades, was refused by the Public Utilities Commission, whose order was affirmed by the Ohio Supreme Court on the ground that the applicant had not shown whether the connection sought was reasonably required.—*W. & L. E. v. Public Utilities Commission (Ohio)*, 117 N. E., 317. Decided June 26, 1917.

Recent Claim Cases

A bill of lading for an interstate shipment stipulated that claims for damage should be made promptly in writing to the agent at the point of delivery within ten days. The South Carolina Supreme Court holds that the carrier's consideration, on the merits, of a claim not so filed does not operate as a waiver, and that question should not be submitted to the jury. There is no presumption of law that a shipper claiming damages for delay in transportation of goods gave the written notice of claim required by the bill of lading. Such a stipulation in a bill of lading was held to be reasonable, for the shipper might give notice of damage by his agents at the point of delivery, their knowledge of damage being imputable to the shipper, and no particular form of action being necessary.—*Murray v. Atlantic Coast Line (S. Car.)*, 93 S. E., 387. Decided September 6, 1917.

The North Dakota Supreme Court holds that the filing of a claim eight months after goods have been shipped from Devils Lake, N. D., to New York, is not a compliance with the require-

ment that "claims must be made within four months after a reasonable time for delivery has elapsed." It also holds that such a provision is not for the purpose of escaping liability, but to facilitate prompt investigation, and is sufficiently complied with when, prior to the expiration of the four-months' period, oral complaint was made to the company's shipping agent of its failure to deliver, and the company acted on such complaint, and not only promised the shipper to send tracers and to make an investigation, but complied with its promise, and a month after such complaint the shipper was advised by the agent to wait a little longer, as he understood that the goods had been sold.—*Shark v. Great Northern (N. D.)*, 164 N. W., 39. Decided July 28, 1917.

The North Carolina Supreme Court holds that a carrier's stipulation in the bill of lading of an interstate shipment of live stock requiring written notice of claim for damage to the shipment before the animals are removed from the place of delivery and before they are mingled with other animals is reasonable and valid; therefore a shipper's verbal notice to an agent of the delivering carrier was insufficient. The court held the decision in *St. Louis, I. M. & S. v. Starbird*, 243 U. S., 592, to be binding on it. *Bryan v. Louisville & Nashville (N. Car.)*, 93 S. E., 750. Decided October 3, 1917.

The same court also holds that a notation by a railroad agent on a freight bill as to injuries to a shipment was not a compliance with a bill of lading stipulation for written notice of loss required to be filed within a given time; and a shipper could not recover for injury to a furniture shipment where he failed to file the required written notice of loss within the specified time, although the agent had actual notice of the loss.—*Taft v. A. C. L. (N. Car.)*, 93 S. E., 752. Decided October 3, 1917.

The South Carolina Supreme Court holds that the provision of a bill of lading requiring, as a condition to liability of the carrier, the filing of claims for loss, damage, or delay, has no application in an action for conversion by the carrier, refusing tender of all charges and selling the goods.—*Dowling v. S. A. L. (S. Car.)*, 93 S. E., 863. Decided October 16, 1917.

UNITED STATES SUPREME COURT

The Supreme Court of the United States, in an opinion by Justice Brandeis on November 12, affirmed the action of the Federal Court for the Western district of Kentucky in refusing an injunction asked for by the St. Louis Southwestern and other carriers hauling pine from the southwest to Paducah and Cairo, to prevent the Interstate Commerce Commission enforcing its orders intended to put lumber rates to Paducah and Cairo on a parity. The carriers had asked for the injunction on the ground that the rates were confiscatory and beyond the power of the commission to make.

Reduction of Rates

The Supreme Court of the United States has upheld the order of the Interstate Commerce Commission (Paducah Board of Trade v. Illinois Central, 37 I. C. C., 719) directing 53 railroads to establish certain through routes and joint rates on logs and lumber from the "blanket territory" to Paducah, Kentucky, and reducing existing rates. (The blanket territory is west of the Mississippi and south of the Arkansas River, 300 miles wide by 400 miles long.) In the report on which it based its order the commission found: (1) That the 16-cent rate to Cairo was not unduly low; (2) that the 22-cent rate to Paducah was unreasonable to the extent that it exceeded the existing rate to Cairo; (3) that the existing disparity of rates gave to Cairo an undue preference and advantage over Paducah; (4) that the distances to Paducah via Cairo were so much greater than the distances via Memphis that the natural route is via Memphis rather than via Cairo; (5) that through routes and joint rates not higher than the Cairo rate should be established from the "blanket territory" to Paducah via either Memphis or Cairo.

The principal railroads serving the blanket territory are the St. Louis Southwestern, the St. Louis, I. M. & S. and the Rock Island. The 22-cent rate from the blanket territory to Paducah via Cairo was made by adding to the joint rate or local of 16 cents to Cairo, the local rate of 6 cents from Cairo to Paducah, Cairo being a rate-breaking point.—*St. Louis Southwestern v. United States*. Decided November 12, 1917.

Equipment and Supplies

LOCOMOTIVES

THE ALABAMA & VICKSBURG has ordered 2 Mikado locomotives from the Baldwin Locomotive Works.

THE PENNSYLVANIA EQUIPMENT COMPANY, 1420 Chestnut street, Philadelphia, is in the market for one second-hand, 65-ton, six-wheel switching locomotive.

FREIGHT CARS

THE RICHMOND, FREDERICKSBURG & POTOMAC is inquiring for 100 hopper cars.

MORRIS & Co. has ordered 400 refrigerator cars from the Haskell & Barker Car Company.

THE LEHIGH PORTLAND CEMENT COMPANY, Allentown, Pa., is inquiring for 50 50-ton hopper cars.

THE AMERICAN STEEL EXPORT COMPANY, New York, is inquiring for 120 20-ton flat cars and 200 tank cars.

THE ILLINOIS CENTRAL has recalled its bids on 1,000 70-ton hopper cars and has issued a new inquiry for 1,000 50-ton capacity hopper cars.

THE ITALIAN GOVERNMENT is receiving bids through the authorities at Washington for 6,000 to 9,000 four-wheel cars similar to those illustrated in the Patriotic War Number of the *Railway Age Gazette*, June 22, 1917, page 1462.

PASSENGER CARS

THE PENNSYLVANIA EQUIPMENT COMPANY, 1420 Chestnut street, Philadelphia, is in the market for 9 second-hand passenger coaches.

IRON AND STEEL

THE NORTHERN CENTRAL has ordered 144 tons of steel for a traveling gantry crane at Baltimore, Md.

THE PENNSYLVANIA RAILROAD has placed an order for 11,800 tons of foundry iron with a central Pennsylvania furnace at the prices fixed by the government. This tonnage represents the railroad's requirements over the first half of next year.

A RAILWAYMEN'S LIBRARY IN ENGLAND.—The importance of educational and recreation facilities for their employees has long been recognized by British railway companies, who have given practical encouragement to the movement in every possible way. Proof of this may be seen in the well-equipped institutions provided by the different companies. Prominent among these is the Great Western Railway Institution at Swindon, which now numbers over 11,000 subscribing members, and has been practically self-supporting since its foundation upwards of 70 years ago. Its success and influence, however, could not have been so far-reaching had it not been for the beneficent goodwill and direct encouragement of the directors and chief officers, from Sir Daniel Gooch, the founder of the institution, to the present day. One of its chief features is the library, which contains about 40,000 volumes, embracing standard works in all classes of literature, including natural and applied science, the fine and useful arts, travel, history and biography, philosophy, religion and sociology, music, fiction and books for the young. Being a railwaymen's library, it specializes in engineering and railway literature. For a graduated subscription, beginning as low as 6d. (\$12) a quarter, a member has the library and reading rooms at his constant service. Numbers of apprentices, journey-men and their families, draughtsmen and clerks, school teachers and other students are thus afforded unique opportunities which are not neglected. The officers and their staffs also utilize the resources of the library both in their official and private capacities. The library has thus made for itself an important place among the higher educational institutions of the town.—*Railway Gazette*, London.

Supply Trade News

Howard D. Taylor, of the Remington Arms Company, Eddystone, Pa., has been elected vice-president of McCord & Co., Chicago.

William S. Boyd, formerly assistant in the purchasing department of the Crucible Steel Company of America at Pittsburgh, is now purchasing agent of the Page Steel & Wire Company, Monessen, Pa.

R. L. Browne, who for the past 15 years has been identified with the electrical and mechanical engineering profession, has recently become associated with the sales department of the Goldschmidt Thermit Company, New York, in the capacity of commercial engineer, after having spent several months in the foundry of that company acquiring a practical knowledge of the Thermit process of welding.

W. J. Schlacks, general manager of McCord & Co., Chicago, was recently elected director and vice-president of that company, with headquarters at Chicago. Mr. Schlacks was born in Chicago on March 28, 1874.

His first railroad experience was as a machinist apprentice on the Illinois Central. Later he went with the Denver & Rio Grande, after which he entered Leland Stanford Jr., University. Following his graduation from college he was appointed assistant mechanical engineer on the Denver & Rio Grande. He was later appointed mechanical engineer on the Colorado & Midland, following which he was general foreman and superintendent of machinery on the same road. In September, 1906, Mr. Schlacks was appointed western sales agent of McCord & Co. and in October, 1914, was promoted to general manager with headquarters at Chicago. As vice-president he will continue to have headquarters at Chicago.



W. J. Schlacks

Charles H. Stoer and M. A. Sherritt, of the Sherritt & Stoer Company, Inc., machinery dealers of Philadelphia, who recently acquired the stock of the Betts Machine Company of Wilmington, Del., have disposed of the real estate buildings and equipment to E. J. DuPont de Nemours & Co. The business of the Betts Machine Company will be continued with improved facilities since the new owners retain the good will, patents, patterns, drawings, jigs, fixtures, etc. The new officers are: M. A. Sherritt, president; Geo. W. Moreton, vice-president, and C. H. Stoer, secretary-treasurer, and the general offices have been moved to the Finance building, Philadelphia.

The Glazier Manufacturing Company, Rochester, N. Y., one of the oldest manufacturers of headlights, cases and reflectors, has reorganized, and has elected Frank Ocumpaugh president and general manager and Fred Kimmel vice-president. Mr. Kimmel is also president of the Rochester Motors Company. Mr. Ocumpaugh was born in Rochester, New York, and after finishing a common and high school education entered business in 1890 as purchasing agent of the Vacuum Oil Company, Rochester, N. Y. He held that position for 27 consecutive years, during which time the size and business of the Vacuum Oil Company expanded tremendously. Two years ago he went into the real estate business, which he has now given up to devote his time to the manufacture of Glazier products. Oscar F. Ostby, who is manager of sales for the company, maintains headquarters at the Grand Central

Terminal, New York. A sketch of Mr. Ostby's life appeared in these columns October 26.

At a meeting of the board of directors of the Rail Joint Company, New York, on Wednesday, V. C. Armstrong, manager of sales, was elected president, succeeding E. Y. Weber, resigned, and Mr. Armstrong and D. P. Wollhaupter, of Washington, D. C., are elected members of the board of directors, succeeding Percy Holbrook and Frank P. Vanderlip, resigned. The other officers of the company remain as at present: G. G. Frelinghuysen, chairman of the board and of the executive committee; W. Paton Thomson, vice-president; Benjamin Wollhaupter, vice-president and secretary, and F. C. Runyon, treasurer. Mr. Weber, the former president, remains a member of the board of directors and of the executive committee. The other members of the executive committee are G. G. Frelinghuysen, V. C. Armstrong, Charles P. Wheeler and W. Paton Thomson.

TRADE PUBLICATIONS

ADJUSTABLE HUB PLATES.—A book has been published by the Smith Locomotive Adjustable Hub Plate Company, Chicago, which describes the application and maintenance of the adjustable hub plate, the use of which is licensed by this company.

AMERICA'S AIRPLANES.—An interesting booklet bearing this title has been published by the Gisholt Machine Company, Madison, Wis. It contains numerous illustrations showing the development of airplanes and dirigibles from the earliest types to those which are now being built for use in the war zone. There is also a section devoted to airplane engines and the manufacture of engine parts.

HEAT INSULATION.—The Magnesia Association of America, 702 Bulletin building, Philadelphia, Pa., has issued a leaflet of 40 pages called "85 per cent Magnesia" and Heat Insulation. The purpose of the book is to present the latest and best information on heat insulation. Particular stress is laid on "85 per cent Magnesia" and its development is described. The various types of insulation made with this product and the uses to which this material may be put are mentioned. Illustrations of many interesting installations are included.

AUSTIN STANDARD BUILDINGS.—The Austin Company, Cleveland, Ohio, has issued a 36-page book explaining the object, methods, results and advantages of the Austin system of standard buildings. The plan covers nine types of structures, in steel, timber and concrete, suitable for housing widely varying industries. The material for building them is kept in stock at various places in the country, so that with the help of an efficient organization, it is possible to complete large buildings at rates hitherto considered impossible. The book is illustrated by drawings of the various types, and halftones of completed structures.

THE DESIGN OF FORGING MACHINE DIES.—A paper on the "Laws Governing Forging Machine Die Design," by E. R. Frost, general manager of the National Machinery Company, which was read before the American Drop Forge Association, has been reprinted by the National Machinery Company, Tiffin, Ohio, as Forging Machine Talk No. 27. The principles governing the design of dies for forging machines have been reduced to simple rules, and numerous illustrations show the application of these rules in making various classes of forgings. The paper contains information that will be of value in shops where forging machines are used.

GEARED LOCOMOTIVES.—The Lima Locomotive Works, Lima, Ohio, has issued bulletin No. 2 describing Shay geared locomotives for industrial railways. These locomotives are designed particularly to operate on lines having sharp curves and turnouts on which rod connected engines can not operate. They are particularly suited for use in industrial plants as they will accelerate quickly and with them it is easier to spot loads more accurately than with rod connected engines. The bulletin gives an account of tests made with an 0-6-0 type engine and a Shay locomotive of equal tractive effort, to obtain comparative rates of acceleration when working under the same conditions and to determine the time required by the two engines to spot a given load at definite points. A brief description of the Shay locomotive truck is also included in the pamphlet.

Railway Construction

ATLANTIC COAST LINE.—This company is building, with company forces, a brick passenger station one story high, 32 ft. wide and 72 ft. long, at St. Cloud, Fla.

BUFFALO & NORTHWESTERN. Construction has been started on this road extending from Buffalo, Okla., to Waynoka, 52 miles, by Walker & Taylor, contractors, of Ft. Worth, Tex. Frank Adams, Oklahoma City, Okla., has a sub-contract. E. C. Johnson, Buffalo, is president, and L. E. Walker, of Waynoka, is general manager of the road.

CANADIAN NORTHERN PACIFIC.—This company has commenced the construction of train shed and a concourse for its new passenger terminal at Vancouver, B. C. The train shed will be 21 ft. in height, 90 ft. wide and 900 ft. long, of reinforced concrete construction on wooden piles, with platforms of wood. The concourse will be 21 ft. in height, 40 ft. wide and 310 ft. long, of reinforced concrete construction on wooden piles, with a floor of concrete. The work will cost about \$170,000 and is being done by the Northern Construction Company, Limited, and Carter, Halls & Aldinger, Limited, joint contractors, both of Vancouver, B. C. The plans were prepared by Pratt & Ross, architects, Vancouver, B. C.

GULF, COLORADO & SANTA FE.—This company is contemplating the construction of a freight station and a machine shop at Temple, Tex. The depot will be a two-story brick building, 32 ft. by 52 ft., with concrete foundations and a basement for a steam-heating plant. The structure will be covered with a tar and gravel roof. Adjoining the depot will be a freight warehouse, 32 ft. by 160 ft., on concrete foundations. It will be one story in height, with a tar and gravel roof, and will have metal rolling doors. Adjacent to the warehouse will be a covered platform, 32 ft. by 54 ft. The buildings will be electric lighted, steam heated and equipped with the necessary plumbing. The estimated cost of the freight house facilities is \$30,000. The proposed machine shop at Temple will be 60 ft. by 100 ft., with concrete foundations, brick walls, machinery foundations, electric light, steam heat and tar and gravel roof. The structure will cost \$15,000, exclusive of machinery.

NEW YORK CENTRAL.—A contract has been given to the Eastern Concrete Steel Company, Buffalo, N. Y., to build a concrete, brick and steel power station, 34 ft. high, 60 ft. wide and 67 ft. long, for the New York Central at Curtis street, Buffalo.

SAVANNAH & ATLANTA.—A contract has been given by this company to H. O. Young, Savannah, Ga., to build a brick warehouse 40 ft. by 250 ft. at Savannah, to cost \$11,000.

INDIA'S LOST RAILWAY EQUIPMENT.—Between April and December of the year 1916 the sum of £13,333 (\$64,800) had to be written off the books of the railways of India for material, rolling-stock, etc., supplied to Mesopotamia, which could not be traced.

INCREASED RATES IN AUSTRALIA.—On the recommendation of P. R. Johnson, an English railway expert, who has been investigating the cause of the unfavorable financial condition of the state railways, increased freight rates and passenger fares have been adopted.

AMERICAN-MADE BRIDGE TO SPAN COLOMBIAN RIVER.—A representative of an American company has recently arrived in Colombia to inspect the site for a bridge over the river Cello to Chicoral, Department of Tolima, which is to be erected in connection with the Tolima Railroad now under construction. The bridge will probably be delivered at Cartagena in November or December next. The contract price was \$15,900 on board at New York. In connection with this bridge it is interesting to note that the Minister for Public Works has recommended that, when possible, a long iron span be constructed over the Magdalena River to connect the Girardot and Tolima Railroads.—*Commerce Report.*

Railway Financial News

BALTIMORE & OHIO.—F. H. Goff, president of the Cleveland Trust Company, has been elected a director to succeed Oscar G. Murray, deceased.

CANADIAN NORTHERN.—Graham A. Bell, of Toronto, has been elected a director to succeed H. W. Richardson.

CHICAGO & EASTERN ILLINOIS.—Under an order of the court in the foreclosure suit brought by the Central Trust Company in behalf of owners of Chicago & Eastern Illinois 5 per cent purchase money first lien coal bonds, the trust company is applying \$1,022,500 received from Receiver Keller in reduction of the amount found due the bondholders by the court. Payment of \$200 per \$1,000 bond is to be made. These bonds are secured by a first lien upon 41,000 acres of coal lands in Indiana and Illinois, which are to be sold under foreclosure December 17 and 18. The committee, which represents \$4,935,000 of the \$5,094,000 bonds outstanding, announces that it will take such action at the sales as in its discretion will best meet the interests of the depositing bondholders.

GEORGIA COAST & PIEDMONT.—Judge Emory Speer in the Federal Court of Macon, Ga., has granted the application of the receivers to issue \$150,000 receivers' certificates.

HOCKING VALLEY.—A dividend of $3\frac{1}{2}$ per cent has been declared, payable December 31 to stock of record December 14. This compares with a dividend of 2 per cent in June, making the total dividends paid this year total $5\frac{1}{2}$ per cent as against 4 per cent in 1916.

KANSAS CITY, MEXICO & ORIENT.—W. F. Hall, of Kansas City, has been elected chairman of the board of directors to succeed Edward Dickinson, deceased.

PENNSYLVANIA RAILROAD.—Samuel Rea, president of the Pennsylvania Railroad Company, answering the published rumors of an amalgamation of the Eastern and Western Lines of the Pennsylvania System, Wednesday, said:

"The Board of Directors is considering the acquisition by the Pennsylvania Railroad Company of the lines comprised in the Northwest System, chiefly the Pittsburgh, Fort Wayne & Chicago Railway, the Cleveland & Pittsburgh Railroad, the Erie & Pittsburgh Railroad, and other roads now entirely owned and operated by the Pennsylvania Company. All the capital stock of the Pennsylvania Company is owned by the Pennsylvania Railroad Company. The acquisition of the Pennsylvania Company, which the directors are considering, is in line with our policy of eliminating unnecessary corporation and duplicate accounting and financing. Whether it is finally consummated or not, it will not disturb the experienced and efficient organization of the Pennsylvania System now at Pittsburgh, which has charge of the administration and operation of the Western Lines. Under the present pressure of traffic, and in order to assist most effectively in the prosecution of the war, we need more experienced officers instead of decreasing the number. The rumored creation of a Chairman of the Board, and other radical changes in our organization, have no foundation in fact."

PITTSBURGH & WEST VIRGINIA.—The following directors have been elected: Asa S. Wing and William R. Nicholson, of Philadelphia; Ernest Stauffen, Jr., of New York, and H. E. Farrell, of Pittsburgh.

WISCONSIN & MICHIGAN.—This road, operating between Peshtigo Harbor, Wis., and Mountain, Mich., a distance of 124 miles has been sold to John Marsch of Chicago, who owns a majority of the first mortgage bonds amounting to over \$1,300,000. The price paid for the road was not made public.

WOMEN POLICE ON THE GREAT EASTERN.—Nine young women were recently sworn in as special constables on the Great Eastern of England. They were dressed in blue coats and skirts, with brass buttons, and wore caps with white covers and the company's badge.—*Railway Gazette*, London.

Railway Officers

Executive, Financial, Legal and Accounting

H. L. Borden, secretary and assistant treasurer of the Atlantic Coast Line at New York, has been elected vice-president, with headquarters at New York.

G. E. Matt, assistant to the auditor and treasurer of the Miami Mineral Belt, has been appointed auditor and assistant treasurer, with headquarters at Miami, Okla.

F. R. Perkins, general freight and passenger agent of the Salina Northern at Salina, Kan., has been appointed also auditor, vice H. G. Strode resigned to accept service with another company.

George J. Adams, chief clerk to vice-president of the Pennsylvania Railroad, has been appointed assistant to the vice-president in charge of accounting, with office at Philadelphia, Pa.

Robert S. Parsons, assistant to president and chief engineer of the Erie at New York, has been appointed assistant to the president and general manager of the Erie and the New York, Susquehanna & Western, also of affiliated lines, and will remain in charge of maintenance and construction, with headquarters at New York. He was born at Hohokus, N. J., and was educated at Rutgers College. In 1895 he began railway work as a rodman on the Erie; the following year he was made assistant engineer, and, in 1899, became division engineer of the New York, Susquehanna & Western. In 1903, he was appointed engineer of maintenance of way of the Erie, and three years later became assistant general superintendent of the same road. He was appointed superintendent of the Susquehanna division in 1907, and three years later was transferred in the same capacity to the New York division. On January 1, 1913, he was appointed assistant general manager of the lines east of Buffalo, N. Y., and Salamanca, with headquarters at New York. One year later he was appointed general manager of the Ohio Grand division, now known as the Erie Lines West, with office at Cleveland, Ohio, and in January, 1916, he was appointed chief engineer; the following September he was made assistant to the president and chief engineer, and now becomes assistant to president and general manager of the Erie and the New York, Susquehanna & Western and affiliated lines, as above noted.



R. S. Parsons

John F. Morris has been appointed assistant general auditor of the Denver & Rio Grande, with headquarters at Denver, Colo., effective November 1. This is a newly created position.

F. G. Sprain has been appointed auditor of freight overcharge claims of the Great Northern, with office at St. Paul, Minn., vice J. A. Nelson, who has been appointed grain claim agent, with the same headquarters.

Operating

J. A. Cochrane, superintendent of safety of the Great Northern, was appointed assistant to the general manager, with headquarters at St. Paul, Minn., effective November 15.

H. E. Birkinshaw, superintendent of the Salina Northern at Salina, Kan., has been appointed general superintendent, and R. E. Greene has been appointed car accountant, both with offices at Salina.

W. J. Sullivan has been appointed assistant superintendent of the St. Louis-San Francisco at Sapulpa, Okla., succeeding F. R. Kennedy, assigned to other duties, effective November 15.

W. W. Scannel, assistant freight auditor of the Chicago Milwaukee & St. Paul, at Chicago, has been appointed car accountant, with the same headquarters, succeeding J. L. Brown, promoted.

J. C. Grisinger, trainmaster on the Chicago, Burlington & Quincy, at Lincoln, Neb., has been appointed inspector of transportation with headquarters at Chicago, succeeding W. E. Fuller, transferred.

M. J. Griffin, formerly with the Chicago, Rock Island & Pacific, has been appointed superintendent of the Chicago, Terre Haute & Southeastern, with headquarters at West Clinton, Ind., succeeding F. A. Leith, resigned; effective November 1.

Samuel J. Hungerford, whose appointment as general manager, Eastern lines, of the Canadian Northern, with headquarters at Toronto, Ont., has already been announced in these columns, was

born on July 16, 1872, near Bedford, Que. He was educated in the common and high schools and began railway work in May, 1886, as a machinist apprentice on the South Eastern and later served with its successor, the Canadian Pacific, at Farnham, Que. He was then machinist at various places in Quebec, Ontario and Vermont. From August, 1897, to February, 1903, he was consecutively assistant foreman at Farnham, Que., locomotive foreman at Megantic, general foreman at McAdam Junction, N. B.,

and locomotive foreman at Cranbrook, B. C., on the Canadian Pacific. In February, 1903, he was appointed master mechanic on the Western division at Calgary, Alta. The following January he became superintendent of locomotive shops at Winnipeg, Man., and four years later was appointed superintendent of shops at the same place. In March, 1910, he became superintendent of rolling stock of the Canadian Northern and the Duluth, Winnipeg & Pacific at Winnipeg, Man., and in May, 1915, was transferred in the same capacity to the Canadian Northern at Toronto, Ont., which position he held at the time of his recent appointment as general manager, Eastern lines, of the same road, as above noted.

H. J. Main, chief dispatcher on the Smiths Falls division of the Canadian Pacific, has been appointed assistant superintendent on the same division, and H. C. Taylor, has been appointed chief dispatcher on the Smiths Falls division, vice Mr. Main.

J. A. Frates, Jr., vice-president and general manager of the Miami Mineral Belt, has been appointed vice-president in charge of operation; H. B. Granlee, traffic manager and treasurer, has been appointed general manager and treasurer; both with headquarters at Miami, Okla.

L. T. Johnston, trainmaster of the River division of the Chicago, Milwaukee & St. Paul, with headquarters at Minneapolis, Minn., has been promoted to superintendent of the Prairie du Chien and Mineral Point divisions, succeeding A. C. Peterson, who has joined the Russian railway corps as a major, effective November 1.

T. F. Durkin, assistant superintendent of the Denver & Rio Grande at Helper, Utah, has been appointed assistant superintendent of the Salt Lake division, with headquarters at Salt Lake City, vice C. F. Seymour, assigned to other duties. E. F. Marshall has been appointed trainmaster of the Salt Lake division, with headquarters at Helper, Utah, vice G. W. Penwarden, assigned to other duties, and J. R. Loftis has been appointed trainmaster of the Salt Lake division, with headquarters at Thistle.

H. M. Eicholtz, whose appointment as assistant general superintendent of the Chicago & North Western, with headquarters at Chicago, was mentioned in these columns on October 26, was born at Mathusa, Ill., on February 18, 1873. His service with the North Western has been continuous since August, 1890, during which period he has served as station baggage man, telegraph operator, station agent, train dispatcher, trainmaster, assistant superintendent and division superintendent, which position he held at the time of his appointment, as noted above.

George Collins, whose appointment as superintendent of the Quinto district of the Canadian Northern, with headquarters at Trenton, Ont., has already been announced in these columns, was born on July 20, 1860, at Wellers Bay, near Trenton, and was educated in the Trenton public and high schools. He began railway work in June, 1882, with the Central Ontario and subsequently served on that road consecutively as agent and train dispatcher at Trenton. From 1892 to 1894 he was secretary-treasurer, then was general superintendent and secretary until October, 1902, when he became receiver and manager. From December, 1906, to August, 1914, he was general manager and secretary and from May, 1913, to August, 1914, a director of the same road. In September, 1914, he was appointed superintendent of the Ottawa division of its successor, the Canadian Northern; one year later he was made superintendent of branch lines and from September, 1916, until his recent appointment he was special representative.

Traffic

C. S. Connolly, general freight agent of the Miami Mineral Belt, has been appointed traffic manager at Miami, Okla.

M. A. Hood has been appointed general agent of the Las Vegas & Tonopah and the Bullfrog Goldfield, with office at Tonopah, Nev., succeeding R. J. Highland.

J. L. Ferguson, whose appointment as general passenger and ticket agent of the Chicago & North Western, was announced in these columns on November 16, was born in Henry county,

Ky., on August 23, 1853, and was educated in the common schools. He began railway work in 1868 as a telegraph operator on the St. Louis, Kansas City & Northern, where he remained until 1875 when he entered the service of the Chicago & North Western, serving successively as ticket agent at Milwaukee, Wis., city passenger agent at Milwaukee, city passenger agent at Chicago, assistant general passenger agent and assistant general passenger and ticket agent. He held the position of assistant general passenger and ticket

agent at the time of his recent promotion to general passenger and ticket agent with headquarters at Chicago, succeeding C. A. Cairns, promoted.

J. J. Clark, chief of the traffic bureau of the Chicago & Eastern Illinois, has been appointed assistant general freight agent; E. J. Schmidt has been appointed to succeed Mr. Clark as chief of the traffic bureau, both with headquarters at Chicago.

W. J. Keane, general traveling agent of the Blue Line (New York Central) with headquarters at St. Louis, Mo., has been appointed commercial agent of the New York Central East Freight Lines, with headquarters at Dallas, Tex., succeeding C. W. Smith, resigned, effective November 6.

J. B. Large, assistant general freight agent of the Pennsylvania Railroad at Philadelphia, Pa., has been appointed general freight agent in charge of through traffic, to succeed Walter Thayer. Walter S. Franklin, Jr., division freight agent at Baltimore, Md.,



S. J. Hungerford



J. L. Ferguson

has been appointed assistant general freight agent, with offices at Philadelphia, Pa., and S. T. Stackpole, acting division freight agent at Baltimore, has been appointed division freight agent at the same place. A portrait of Mr. Large and a sketch of his railway career were published in the *Railway Age Gazette* of October 19, 1917, page 727.

C. A. Cairns, whose appointment as passenger traffic manager of the Chicago & North Western was announced in these columns on November 16, was born at Cleveland, Ohio. He entered railway service in 1878 as messenger in the president and treasurer's office of the Cleveland, Columbus, Cincinnati & Indianapolis, from which date he served to March 1, 1879, as stock clerk in the passenger department. He later held various positions in the general passenger department of the combined Cleveland, Columbus, Cincinnati & Indianapolis, Indianapolis & St. Louis, and Dayton & Union, until April 15, 1889, when he resigned as chief clerk to become chief clerk in the passenger department of the Chicago, St. Paul & Kansas City. From January 1, 1890 to August 15, 1892, he was assistant general passenger and ticket agent on the same road, following which he held various positions in the general passenger department of the Chicago & North Western until January 1, 1895, when he was appointed assistant general passenger and ticket agent. From March 1, 1903, to November 15, 1917, he was general passenger and ticket agent, the position he held when promoted to passenger traffic manager, with headquarters at Chicago, as noted previously.

Walter Thayer, general freight agent of the Pennsylvania Railroad, at Philadelphia, Pa., has been appointed general coal freight agent, succeeding to the duties of the late Robert H. Large. Mr. Thayer was born on April 27, 1874, and received his early education at the Haverford, Pa., schools, and was graduated from the University of Pennsylvania in the class of 1897. He entered the service of the Pennsylvania Railroad in the fall of 1895, as a receiving clerk in the Thirtieth and market streets freight station, Philadelphia. In 1896 he was transferred to Dock street station as a clerk in the claim department, and in 1897 he was again transferred to the rate room at the Broad street station. He was then promoted to freight solicitor of the United Railroads of New Jersey. In the fall of 1901 he was made special agent in the freight department of the Buffalo & Allegheny Valley division, with headquarters at Pittsburgh. In 1903 he was appointed eastern manager and general freight agent of the Erie & Western Transportation Company—Anchor Line—with headquarters at Philadelphia. On June 1, 1910, he was appointed assistant general freight agent of the Pennsylvania Railroad, and in May, 1912, was promoted to general freight agent, which position he held until his recent appointment as general coal freight agent of the same road, as above noted.



C. A. Cairns



W. Thayer

Engineering and Rolling Stock

J. C. Pickens, assistant engineer of the Atlantic Coast Line, at Rocky Mount, N. C., has been appointed division engineer, construction department, with headquarters at Richmond, Va., succeeding M. S. McDanel, resigned.

C. H. Crawford, assistant engineer in the mechanical department of the Nashville, Chattanooga & St. Louis, has been loaned to the War Industries Board of the Council of National Defense for service on the storage committee.

Galen B. Owen, superintendent of maintenance of the Erie at New York, has been appointed chief engineer of the Erie and the New York, Susquehanna & Western, and Harold Knight, assistant superintendent of maintenance at New York, has been appointed superintendent of maintenance of way; both with headquarters at New York. A sketch of Mr. Knight's railway career was published in the *Railway Age Gazette* of April 27, 1917, page 915, and a portrait of Mr. Owen and a sketch of his railway career were published on May 18, 1917, page 1073.

H. H. Temple, whose appointment as chief engineer of the Pittsburgh & West Virginia and the West Side Belt, with headquarters at Pittsburgh, Pa., was announced in the *Railway Age Gazette* of November 16, 1917, entered the service of the Baltimore & Ohio Southwestern in February, 1899, as an assistant engineer. In December of the same year he was appointed resident engineer in charge of construction work on the Springfield division. From March, 1901, to March, 1902, he was signal engineer on the same road, and from the latter date to April 1, 1903, he was division engineer. On April 1, 1903, he was transferred to the Baltimore & Ohio, as division engineer of the Connellsville division, and in December, 1903, he was moved to the Pittsburgh division. In June, 1905, he was promoted to engineer maintenance of way of the Pittsburgh system, which position he held until January 1, 1907, when he became superintendent of the New Castle division. On March 1, 1914, he was appointed superintendent maintenance of way in charge of construction and maintenance of the San Antonio & Aransas Pass. His appointment as chief engineer of the Pittsburgh & West Virginia and the West Side Belt was effective October 22.

Railway Officers in Military Service

Fred. Jasperson, engineer of docks and construction of the Philadelphia & Reading at Port Richmond, Philadelphia, Pa., has been commissioned a lieutenant-colonel, and has left for Russia with the special force organized for the government by the Baldwin Locomotive Works, for repair and reconstruction work on the railways in Russia.

OBITUARY

G. E. King, assistant general passenger and ticket agent previous to 1905 of the Michigan Central, at Detroit, Mich., died on November 19.

G. H. Worcester, formerly superintendent of the Lake Shore & Michigan Southern and later superintendent of the Harlem division of the New York Central & Hudson River, previous to 1891, died at his home in New York on November 17.

George M. Miller, formerly from 1881 to 1887 president of the Denver, Utah & Pacific and later president of the Housatonic Railroad, vice-president of the New York, Providence & Boston and a director of the New York, New Haven & Hartford, died on November 14, at his home in New York, at the age of 87. He served as president of the Newport & Wickford Railroad and Steamship Company in 1871, and in 1879 was president of the Providence & Stonington Steamship Company, which is controlled by the New Haven.

Edward T. Postlethwaite, assistant to the president of the Pennsylvania Railroad, at Philadelphia, Pa., died on November 14, in a hospital in that city. He was born in July, 1850, and entered the service of the canal department of the Pennsylvania Railroad in April, 1863, as timekeeper, and in 1872 became shop clerk in the Northern Central shops at York. He later served in the office of the superintendent of motive power of the Pennsylvania Railroad at Altoona and then was successively chief clerk in the office of general manager, second, and first vice-president until February 10, 1897, when he was appointed assistant to the president.

Railway Age Gazette

Volume 63

November 30, 1917

No. 22

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* Illustrated.

To operating officers, the prize paper on discipline without suspension, printed in this issue, should offer a number of

Progress in Railroad Discipline

hints concerning the best way to perfect the discipline of a hundred or a thousand train- and station-men. It cannot be that there is much need of further argument on the bald primary question of suspensions versus the Brown system, for those officers who still continue the old practices are practically unanimous, so far as we have been able to discover, in speaking only words of praise for the new system and apology or explanation for the retention of the old. Therefore, it is proper in this place to concentrate attention on the task of perfecting what has already been well begun. And we address operating officers collectively, excepting none, because of the universal testimony to the imperfection of the present rules, regulations and practices everywhere. The difficulty of maintaining the ideals so clearly outlined by Messrs. Heath and Keeler is constantly recognized on the best managed roads. It might sound pleasanter to use a softer word than "imperfection"; but why dissemble? Everybody knows the never-ending perplexities of keeping a large force of trainmen keyed up to a high level of energy and vigilance. The road to perfection is a long one; but the goal is clearly recognized, nevertheless. There is no greater satisfaction in a superintendent's or a trainmaster's workday life than that to be found in a force of men whose intelligence, training, and character are so well settled that the officer's confidence in them can be based on knowledge as well as faith; and where the employees' capabilities and their confidence in their employer are settled on such a sound basis that their loyalty can be seen to be growing constantly firmer.

George W. Anderson, of Massachusetts, one of the new members of the Interstate Commerce Commission, held a hearing

Discrimination in Mileage Tickets

at Boston last week to consider general traffic conditions on the New England railroads; and in discussing passenger fares he said, according to the reports, that he "never could understand why there should be discrimination between a person who could afford to pay \$25 for a mileage book and one who could buy only a single ticket"; he thought that it might be a good

thing to "do away with mileage books and charge a flat rate to everyone." The reporters might have added that no one else ever could understand that point, either, without bolstering up his reasoning by arguments both illegitimate and unscientific. To say that the "wholesale principle" warrants a discount to the buyer of \$25 worth of rides makes a big point out of a very little one. Mileage tickets have been justified on the ground that they accommodate the commercial traveler; but the only material ground for giving him a lower rate is to secure his freight shipments; and freight discounts or commissions ought to be charged to freight accounts, not passenger accounts. It used to be said that mileage tickets were very convenient for use by dishonest conductors and dishonest drummers in combining to cheat the road; and it is still said that they are traded in by storekeepers who sell parts of tickets, at a small advance, to persons who wish to save a few cents in that way. However, the popularity of the mileage ticket rests, not on arguments about economy or honesty but on the views of thousands of people who feel that they have saved a great deal of money by using them; and it may be that Mr. Anderson's frankness is due mainly to his newness. The public and the railroads will await with interest the views of the other eight commissioners on this question of justice to the poor.

The Railroads' War Board, in bulletin 42, suggested that in order to increase the efficiency of the railroads they "en-

Highways Helpful to Railways

courage the use of motor trucks and co-operation with the trolley lines for handling short haul freight." To make use of motor trucks, it is, of course, necessary to operate them over properly constructed highways and to keep up the maintenance of these highways. Priority order No. 2, issued by the Priorities Committee of the War Industries Board of the Council of National Defense on October 27, denies the use of open top cars for the transportation of materials and supplies "for the construction, maintenance or repair of public or private highways, roadways, streets or sidewalks." This order, if it is not modified during the winter, will, of course, stop work on all highways so far as it depends on the haulage of material in open top cars. Meanwhile a Highway Transport Committee has been appointed by the Council of National Defense, as noted in the *Railway Age Gazette* of

November 16, 1917, to study the possibilities of motor truck transportation; it is quite probable that this committee will investigate the possibility of relieving the railroads by motor truck haulage at congested terminals. It is exceedingly important that railway officers co-operate with state highway commissioners and public authorities to determine just what roads will be of the greatest value from this standpoint so that all of the available money and material may be expended on the strategic points. These must be determined upon in the very near future in order that the plans may be made and the material provided so that work may be started at the opening of the season. If the strategic value of these stretches of roadway is placed before the Highway Transport Committee and is clearly understood, the Priorities Committee will doubtless co-operate in seeing that arrangements are made for transporting the necessary materials.

THE VALUATION DEPARTMENT AND EXEMPTIONS

IN proportion to the number of its employees, probably no branch of railway service has furnished as many men for the various classes of government work in this war as the engineering department. Not only has it contributed its full quota by conscription but it furnished three of the nine regiments of railway men sent to France in addition to representation in the five operating regiments. Many engineers have been called to assist in the building of the cantonments and other construction activities of the government while others have enlisted in the engineering corps of the army for foreign service. As a result the engineering forces are seriously depleted on many roads, even to the point of seriously delaying the progress of improvements.

One branch of the engineering department which is particularly hard pressed is that engaged in valuation. Here the forces have been recruited almost entirely in the last three or four years, and are composed to a large extent of young, unmarried men. As a result the number leaving for military service has been unusually large. At the same time the federal division of valuation has been urging the roads to make greater progress in the completion of maps and the collection of data. In spite of this pressure the roads have generally followed the policy here as elsewhere in the engineering department of refusing to claim exemption for their men, believing that the war-time needs of the government were at least equal to their own. Because of the position taken by the roads in this respect there has been much criticism of the government valuation forces because of rumors that exemption is being claimed generally for the men in at least one district in an effort to avoid the depletion of forces suffered by the roads. It is encouraging to learn from official sources that this reported attitude of at least the one district does not reflect the position of the Division of Valuation. We are advised that the division has encouraged the enlistment of its men in military service, and particularly the entry of its engineers into the Engineers Reserve Corps, and that many employees of the Division of Valuation have enlisted in that branch of the service. Likewise leave without pay has been granted employees desiring to attend the training camps, the law preventing the continuance of the salary of government employees whose names go on the pay roll in another branch of the service. Likewise we are advised that the officers in the valuation department have been instructed not to send in claims for exemption for approval to headquarters unless in their opinion it would be practically impossible to fill the men's places at the present time. Acting under these instructions 52 applications for exemption have been received, only 31 of which have been approved by the commission.

The total number of men in the employ of the Division of Valuation is about 1,575.

The fact that the Division of Valuation is taking this broad view with reference to exemption in spite of the plea of certain men in the division that universal exemption should be claimed is to be commended. At the same time the fact that claims for exemptions are being urged by anyone indicates the drain on the railway engineering talent of the country which the valuation work is creating. This gives added weight to the suggestion that the work be discontinued at this time in order to further the solution of the one big problem of this country at the present time—winning the war. We believe this to be particularly desirable because of the recent statement by the director that he has been forced to reach the conclusion that the present law does not require the determination of final values of the properties of the railroads, and that this will not be done at the present time, so that the work when completed will be far from conclusive.

THE COAL SITUATION—A NATIONAL MENACE

THE coal situation is becoming a menace to the prosperity of the country and to the success of its military preparations. The total production of bituminous coal in the United States in 1916 was 502,520,000 tons, and the total production of Pennsylvania anthracite was 87,578,500 tons, making a grand total of 590,100,000 tons. This was the largest output ever known, being an increase over that for 1915 of about 58,400,000 tons. It was estimated after the United States entered the war that in order to meet the industrial and military needs of this country the production in 1917 should show an increase over that of 1916 of 100,000,000 tons, or about 17 per cent.

The increased production which it was estimated would be needed is not being attained. At the end of October the production of bituminous coal was less than 10 per cent ahead of that in the corresponding year of 1916.

In consequence of the failure to produce the required amount of coal, there is a general shortage of it for domestic, for industrial and for other purposes. The concerns engaged in the manufacture of munitions complain that maximum output by them is prevented by inability to get sufficient coal. The railroads are in danger of not being able to get enough. The householders in communities all over the country are being rationed by their dealers and live in constant dread lest they will be unable to keep themselves warm this winter.

Why does this condition exist? It exists mainly because the coal producers of the United States have displayed sordid selfishness, a want of business capacity and a lack of patriotism. The railways, foreseeing the course of developments, organized themselves to meet the country's transportation needs during the war within five days after war was declared. The coal producers have not yet properly organized themselves to meet the country's needs for fuel. The railways, in spite of the seriousness of their labor situation, have succeeded in keeping their employees sufficiently satisfied to avoid interruption of their operations, except in a few sporadic cases. The coal producers have shown such want of diplomacy and capacity in dealing with their labor that month after month the reports of the United States Geological Survey have shown that mines all over the country have been working to much less than their capacity because of labor troubles. The railways have been obliged to go on rendering their service for the same rates as before the war, although they have had greater increases in expenses of operation than the coal producers; and yet during the five months ending with August they handled 16 per cent more freight than in the same months of last year, and in the

months from May to October, inclusive, they transported 18 per cent more coal than in the same months of last year. They have moved this year's increased output of coal, and also the vast quantities of it which in former years would have moved by water. The coal producers, on the other hand, succeeded in getting the government to fix prices for coal vastly higher than any ever known before the conditions created by the present war; but in spite of these high prices they have exerted themselves sufficiently to increase their production by only about 10 per cent.

While these facts are obvious, the government Fuel Administration at Washington does not seem to have discovered them. Instead of adopting measures to secure greater production of coal, it is largely engaged in paying compliments to the producers for having secured the relatively small increase of production they have obtained and in joining with them in "passing the buck" to other agencies. The coal producers are practical men. The Fuel Administration seems to be composed chiefly of theorists. To all appearances, the practical men are manipulating the theorists to suit their own purposes. It looks as if the Fuel Administration which was created largely to control and promote the production of coal, has fallen under the control of those it was created to regulate.

Having failed through avarice, incapacity and want of patriotism to meet the requirements of the situation, the coal producers are engaged in the familiar practice of crying "stop thief." The National Coal Association, an organization formed apparently to increase the output of misinformation regarding the fuel situation rather than the output of coal, is issuing frequent statements intended to put the responsibility for the failure to secure adequate production of coal upon the railroads. On October 8 the National Coal Association announced that "bituminous coal production in the United States was reduced approximately 2,000,000 tons last week by car shortage and railroad congestion." Again, on November 23, the coal operators issued a statement saying, "It has been impossible for the railroads expeditiously to handle even the most vital necessities of the country, including fuel."

But the coal producers give reports to the United States Geological Survey as well as to the general public regarding their activities. Doubtless under present conditions they do not make their reports to the Geological Survey any less favorable to themselves than is entirely justifiable. Nevertheless, their reports to the Geological Survey, taken at their face value, indicate a very different situation from the statements being given out for public consumption by the National Coal Association.

In a letter published in the Washington Post on November 22 Fairfax Harrison, chairman of the Railroads' War Board, called attention to the actual situation as disclosed by the weekly reports of the Geological Survey. He said:

"The statistics indicate that 'full time output' of the bituminous mines would be at the rate of approximately 14,300,000 tons a week. During the seven weeks ended with November 3 production amounted to 10,600,000 tons per week, or about 4,000,000 tons a week less than 'full time output.' We find that the part of the weekly deficiency as compared with 'full time output,' which was attributed by the Geological Survey to 'car shortage,' was 1,717,000 tons, but this accounts for only 45 per cent of the failure to secure 'full time output.' It leaves 2,209,000 tons, or 55 per cent, of the weekly deficiency to be accounted for on other grounds. After allowing for all the shortage of production attributed by the Geological Survey to the railroads, there still remains a much larger additional shortage of 2,209,000 tons a week, or 13,500,000 tons in seven weeks, which it was entirely within the power of the National Coal Association to produce and deliver to the public."

During the eight months since the United States entered the war, the railroads have not only handled a vastly larger coal traffic, but a vastly larger traffic of every kind than they ever did before; and yet during at least three-fourths of this period reports of the Geological Survey have shown that most of the failure of the mines to secure their theoretical

"full time output" has been due to causes other than "car shortage." The Geological Survey classifies the causes of failure to secure "full time output" under the headings, "Car Shortage," "Labor Shortage and Strikes," "Mine Disability," "No Market," "All Other Causes," and "No Cause Given." The combination of causes resulting from conditions under the control of the coal producers themselves during 12 weeks out of the 18 ending with November 3, had more effect in limiting the total output of the mines than did car shortage.

It goes without saying that the prime requisite to the maximum transportation of coal is the loading of cars as fast as they are set at the mines. When the mines are prepared to produce to full capacity, but the railroads do not furnish enough cars, the limitation of output is due to car shortage. When the railroads furnish enough cars, but the mines are unable to load them all, the limitation of output is due to shortcomings in the operation of the mines. Since the reports of the Geological Survey show that shortcomings in the operation of the mines have had much more effect in preventing full time output than car shortage and railroad congestion, it seems to be about time that the coal producers should begin to do their part in securing full time output instead of inspiring attacks upon the railroads for their relatively small failure to do their part.

There is a tradition that the streets of ancient Jerusalem were kept clean by every man sweeping in front of his own door. Consideration of the advantages of this practice is commended to the producers of coal. The *Railway Age Gazette* does not believe in government operation of industries. If, however, there is any industry in America which, since this country entered the war, has justified serious consideration of government seizure and operation of it, that industry is the coal industry. If the coal producers persist in following the course that they have thus far been following, they will be the first of the large industries to provoke the natural public resentment which will land them in the hands of the government.

THE POOL OF THE EASTERN LINES

THE *Railway Age Gazette* in an editorial in its issue for November 23 entitled, "The Railway War Problem and Its Solution," emphasized the point that the main thing needed to enable the railroads to handle more traffic was to pool their facilities. We also indicated that before this could be done, the anti-pooling section of the interstate commerce act and other federal laws restricting the freedom of action of the managers of the railroads must be repealed.

We were right as to the former point. The Railroads' War Board, by action taken last Saturday, has supported the contention as to the need for complete pooling. We were wrong as to the necessity for legislation. The War Board created a pool of the railroads east of Chicago without waiting for the slow processes of legislation to authorize it.

The statement issued by the Railroads' War Board outlining the measures adopted referred to them as "revolutionary." This was no exaggeration. Under the plan adopted the operating vice-presidents of the eastern lines are authorized and instructed to work all of the facilities of the railroads in the territory east of Chicago as if they were all owned by a single company. If a single company owned them and if it were well operated, it would move every passenger and ton of freight over that line which at any given time was in the best shape to handle it; and this is what the War Board has directed the committee of operating vice-presidents to do, and what it has begun to do. Just how extensive will be the changes in routing and in the methods of handling passengers and freight required to accomplish the desired result, only experience can show, but

whatever methods are necessary will be adopted, regardless of the interests of the individual railway companies.

The situation on the eastern lines is the key to the entire transportation situation of the country. On them is being concentrated a vast traffic originating throughout the United States. In consequence, there has developed on them a congestion which is largely responsible for the shortages of cars being reported from other sections. The pool of facilities which has been created in the east is, therefore, adapted not merely to relieve the situation in that section, but also to improve it throughout the country. One important part of the plan is the transfer of as many men, locomotives and machine tools as practicable from the western and southern lines to the eastern lines and the use of the repair shops of the western and southern lines to some extent in maintaining the equipment of the eastern lines.

The creation of this pool of the eastern lines is the most important step which has been taken by the Railroads' War Board in carrying out the resolution adopted by the railway presidents in Washington on April 11 to operate all the railways of the country as a single continental system. The first important step taken in carrying out that resolution was the creation of the box car pool. The next was the adoption of measures, which have proved highly successful, for securing a greater utilization of locomotives and cars. The next was the pooling of all military freight and passenger transportation. This last mentioned is a measure concerning which not much has been said, but which has been of great importance. In co-operation with the government military authorities, the Railroads' War Board and its subsidiary committees have regularly routed military freight and passenger business over the lines of least resistance. It has been chiefly due to this that there have been practically no congestions or delays in the transportation of materials for the construction of the cantonments or in the movement of troops, or of supplies for the troops. In addition, the transportation of supplies for this country's European allies has been practically pooled.

In spite, however, of all these measures and especially of the great increases which have been secured in the amount of traffic moved by every locomotive, every car and every train, a very serious congestion developed on the railways in the eastern territory and especially upon certain lines in that territory. The main cause of the congestion has been the enormous increase of business, but another important cause has been the failure of the government to adopt adequate measures for controlling the movement of materials being used in its military preparations. Judge Lovett, the government priority director, has not issued enough priority orders to cause any trouble, but the different government departments have had preference given to such a large volume of shipments that last week it was reported that on certain of the main eastern trunk lines two-thirds of all the freight being handled was moving under preference requirements. The railways have asked the representatives of the government to help relieve the situation by such means as the diversion of traffic from the North Atlantic to the South Atlantic ports, by the reduction of preference orders and by the reduction of the cross-hauling of coal.

The pool of the eastern lines which has been created is primarily a pool of physical facilities. The duty of the government in the premises is not doubtful. Its officials were cognizant before the railways took this important step that they were going to take it and the reasons for it. Therefore at the earliest practicable time the government should adopt all measures necessary to enable the roads to do with unquestioned legality all the things they are now doing or that they ought to do in future to promote the public welfare, and at the same time to prevent any of them from suffering serious losses as a result of the patriotic course they are following.

NEW BOOKS

Ingeniería de Ferrocarriles. By Verne Leroy Havens. First Edition, 357 pages, 4½ in. by 7 in. Illustrated. Bound in leatherette. Published by John Wiley & Sons, New York. Price \$3.50.

This book is written in the Spanish language and is intended for the use of the railroad builder of Central and South America and his assistants. The sub-title, "The Theory and Practice of Railways from the Conception of the Idea to the Completion of the Project," expresses the purpose of the book, namely, to condense within the space of 356 pages, the fundamental principles of economic railway location, the methods of making railroad surveys, the management of field parties, and the principles of railway surveying. The last 100 pages are devoted to the usual tables found in a field book on railroad engineering, using the metric system. The book contains chapters on Commercial Considerations, Railway Estimates, Reconnaissance, Field Party Organization and Equipment, Preliminary Surveys, Topography, Railway Economics, Railway Surveying and the Adjustment and Care of Surveying Instruments.

Shape Book. 352 pages. 5 in. by 8 in. Bound in Flexible leather. Published by the Carnegie Steel Company, Pittsburgh, Pa. Price \$1.

This is the sixth edition of the Carnegie Shape Book and, with few unimportant exceptions, contains profiles of all of the sections rolled in the structural plate, bar and rail mills of the Carnegie Steel Company. Compared with the fifth edition issued only two years ago, there are 265 pages in the new volume in place of 227 pages in the earlier one devoted exclusively to the profiles of sections. This increase in the number of sections has been made necessary by the remarkable expansion in ship building and the extensive use of steel frames for windows, doors and skylights in industrial building construction. In addition to sections for these purposes and the usual structural steel sections, dimensions are given for the standard A. S. C. E., and A. R. A. rails and a considerable number of special rail sections, as well as the sections of angle bars and other forms of rail joints. Four pages are devoted to sections of steel ties. The last 85 pages comprise tables of weights and areas and an index to the section numbers.

Wood and Other Organic Structural Materials. By Charles Henry Snow, dean of the School of Applied Sciences, New York University. 478 pages, illustrated, 6 in. by 9 in. Bound in cloth. Published by McGraw-Hill Book Co., 239 West 39th St., New York. Price, \$5.

Wood, unless treated alone, is usually associated in texts with the other common structural materials, steel, iron and masonry. In this book it is associated with certain other organic materials used in structures, namely, oils, paints, varnishes, glues and India rubber. The subject of wood covers 376 out of the 478 pages and the treatment may be said to comprise a general account of its physical properties. Strength, elasticity and other characteristics of special importance in the structural use of wood receive only minor treatment, a policy which the author justifies in the preface. The first 44 pages are given to an exposition of the physical makeup of wood. Following this, nearly 200 pages are devoted to a cataloging of the various species and their characteristics. Thirty-three pages cover the common structural properties, and following these is a chapter on decay. Fire hazards with respect to the use of wood in structures are also covered at some length. Marine wood borers and other wood destroying insects are given a much more full and complete treatment than is usually found in most books on wood. Fifty pages are devoted to the protection of wood against decay and animal life by the well known methods. The last 100 pages of the book cover the physical properties and uses of the other organic materials mentioned above. The treatment is interesting and combines in one volume much information that is not often found outside of the more extended encyclopedias.

Letters to the Editor

ARE LOCOMOTIVES SLACKING?

NEW YORK

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Why should all the recent remarkable improvement of railroad operation be secured by heavier car loading? In opening the rate case for the railroads George S. Patterson, railroad counsel, is quoted in the November 9 issue of the *Railway Age Gazette* as making this significant statement:

"The Eastern lines are achieving remarkable efficiency records with a plant several years behind the growth of the country. Eight billions more ton-miles were produced in the first four months of the war than in the same period last year. This gain of 15 per cent in service rendered the nation, with only 1½ per cent in equipment, was almost entirely the result of the heavier trainloading."

Is the present locomotive equipment already hauling up to the limit of its weight? Certainly a study of some of the annual reports would indicate otherwise.

The Southern Railway and the Illinois Central have approximately the same class of traffic. The Southern owns 1,660 locomotives against 1,437 for Illinois Central. But while the Illinois Central increased the number of freight ton-miles 17 per cent with only 3.3 per cent increase in freight locomotive miles, the Southern increased its revenue ton-miles 14.6 per cent and took 12 per cent more freight locomotive miles to do it. Why this difference? Heavier engine loading is the answer. What has been done by one road can be duplicated by others. The pressure for more transportation is coming stronger and stronger. It is only a matter of time till all managements will be awake to the opportunity for increased efficiency that lies in heavier engine loading. It is reported that the Southern is increasing the hauling capacity of its existing locomotives by modernizing them at a rapid rate. When this work is complete and if the re-rating is made on new basis of a heavier loaded and therefore easier hauling train, the Southern will undoubtedly show a fine increase in ton-miles per freight locomotive miles.

A. N. OPERATOR.

REDUCING THE NUMBER OF TELEGRAMS

RATON, N. M.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The article appearing in your issue of September 7, entitled "Swat the Letter Campaign," leads the writer to observe that the paring down of some telegrams and the entire elimination of others would make an appreciable saving.

How many of us, when dictating or writing a telegram, make a mental calculation of what the telegram would cost the company if sent at commercial rates and what would be saved out of our own pocket in case we were to pay for it by cutting out an extra word or two?

Such phrases as "Please advise" or "Advise quick," have no place in a telegram. The mere fact that we are sending a telegram should indicate to the recipient that prompt action is required. We get into a habit of sending the conductor and engineer a certain form of message, when through some fault or other the train is not making the time expected, or the engine has a mechanical failure. In these progressive days of telephones, better and more concise information can usually be had by talking to either on the telephone. The engineer should make a report or send a message stating the engine's disability and not have to be asked for it by wire.

Almost every railroad in the country has passenger train service that leaves general and division offices after the

closing hour, and passes stations during the night, which could carry messages enclosed in a certain colored envelope requiring preferred attention over ordinary mail. Yet every day we see messages originating from general and division offices that could be efficiently handled by mail. Some roads have adopted this "Train-gram" system, but there is still big room for improvement in reducing the number of telegrams handled and eliminating unnecessary words.

In order to bring about a reduction in the number of telegrams handled, the manager of the telegraph office, for instance, should make a copy of a few messages that appear unnecessary or contain unnecessary words, and send copies to superintendent of telegraph, or to the division superintendent, to be handled with party at fault. I do not mean to imply that the manager of the telegraph office should be dictator or censor of telegrams passing through his office, but once it is generally known that useless and lengthy telegrams were being watched, a big reduction will be noticed.

T. C. LOONEY.

WHAT IS A FULL CREW?

ELIZABETH, N. J.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Judging by the report printed in your paper, November 16, the hearings held by the State Railroad Commissioners on the Central of New Jersey "full crew" application did not bring out much of anything that would really enlighten anybody on what the law requires or what it ought to require; or whether it is of any use at all. If you have quoted all that was in the report concerning the "protection of passengers and employees," which is said to be the object and purpose of the law, it must be a pretty poor report; for the question of safety was not wholly ignored. At several points the witnesses were questioned as to whether a certain piece of work could be done any more safely by three brakemen than by two, and in every instance, I believe, the answer was that there was no difference. One witness summed up by saying that the sixth man (the third brakeman) was as necessary on a freight train as a spare tire on an automobile; but nobody seems to have cared to inquire how the fifth tire makes an automobile run any more safely or in what way it "protects" the occupants of the car or of any other car on the street, except as it protects them from the annoyance of a long delay in case a tire has to be renewed while on the road.

If you had been in the lobby outside of the hearing room on one of the days of the investigation you might have heard some facts concerning this question of freight train operation, more enlightening than those brought out by the commissioners. It is not an unheard of thing for more light to be shed on knotty questions in the lobbies than in the court room, and your readers will be interested in the following scraps of a dialogue between a yardmaster, who may be called Frank Elston, and a venerable looking lounge, who may have been a yardmaster (or a reporter or a clergyman) forty years ago, but whose only present occupation seems to be to sit around looking like Judge Chambers. I cannot tell you his name, but we may call him I. Newton. Approaching the yardmaster, whom he seemed to know, he said:

"Rather dreary chin music in there" [in the hearing room].

Elston: "I believe you! Lawyers never seem to get anywhere until they get up to make their own speeches. As to the witnesses most every lawyer seems either to think they are too tender to be abroad except when packed in cotton, or else they are enemies who ought to be put in jail for their stupidity or their dishonesty. Why don't they get somebody on the witness stand who can tell that bunch [the commissioners] what's what?"

Newton: "That ain't the way they do things in courts!

But is there really anything in this claim of the trainmen that they have such a hard job getting over the road with these heavy trains?"

Elston: "Yes; there is something in it; but what makes me mad is their darned laziness. Those difficulties which their lawyer makes so much of are real enough, but what do they amount to? When a drawbar pulls out in the middle of a fifty-car train there is no fun in dragging a heavy chain from the caboose, especially if it is a dark night and you stumble over a tie and fall and scratch your hands; but what has that to do with protecting the passengers and employees which the commissioners say is the purpose of this law? Everybody knows that a fifty-car train of today is a slow coach compared with railroading years ago, but what if it is? Does the fact that a train loses an hour on the road because of a delay which could have been reduced to half an hour if another man had been there warrant the legislature in increasing our expenses for brakemen? I am constantly watched by my boss to see if I am wasting the company's money in any detail of my work; and here these lazy brakemen are doing their best to waste the company's money by putting on a man who does about five minutes' work on a trip—five minutes of necessary work, I mean."

Newton: "But how about those terrible long trains when they have to stop in a cut, on a curve, where it is impossible to see from one end of the train to the other? They claim it is dangerous handling trains in such conditions."

Elston: "Shucks! The 'danger' is all in the lawyer's eye. The brakemen know better. They wouldn't try to stuff that down the throat of a commissioner who knew anything about railroading. If you can't give a signal because of a curve you've got to run forward a few cars; that's all. It may delay you as much as five minutes, but what has that got to do with the safety that they are always harping on? And, did you notice that fat fellow who was asked about where the 'full crew man' rode? Always in the caboose! If he is needed anywhere it is on the middle of the train, where he can watch for hot boxes and where he can pass the hand signals when they stop in that Phillipsburg cut; but the twentieth century brakeman is not putting himself to any such inconvenience as riding out on top when he knows that it is not necessary. The more men they have in a crew, the less attention they pay to the little things. They don't even inspect the running gear at tank stops as they pretend to do. Why, on the Pennsy a year or two ago, down below Trenton, they had a wreck, killing several men riding in a car with some race horses and costing the company \$100,000, all due to a hot box which had been blazing for 10 miles, and not a man in the crew had seen it! If the extra man would ride on top; in the middle of the train; and if he would watch out as he ought to, he would, once in a while, discover a hot box, or a brake beam down, which would not be seen from the engine or from the hind end; but those occasions are so rare that they are not worth counting."

Newton: "I suppose that in taking and leaving cars at way stations, the additional man is a real help. They have to flag trains in all directions, don't they? I should suppose it would take a half dozen men instead of two."

Elston: "Not much! That is one of their principal fads, but there is not anything in it. Many times they can save perhaps five minutes by having the extra man, but that five minutes' saving costs somewhere from ten to a hundred dollars; for the stops of the through trains, in which this supposed saving is made, do not happen very often. There isn't any question of safety about it. As to flagging, the block signals protect them both ways. If there is any danger that some extra freight may come along and run into them, the thing to do is to jack up the engineers of those extras so that they will obey the block signals."

"This 'full crew' nonsense is tiresome. What is a full crew? Why, one consisting of enough men to do the work. On a long local passenger train they might need four or five

men, to assist passengers. On a local freight train they can economize time—not increase safety—by having a half a dozen men. But on a long freight train, every movement of which is controlled by the engineer with his throttle and his brake valve, the crew of a conductor and two brakemen have nothing at all to do for about nine-tenths of the time. The committees, who simply want to make more jobs (they will ask the legislature for a second extra man as soon as they dare to) talk loudly about safety; but all the real purpose they have in their minds is the safety of their pockets; or, rather the fattening of their bank accounts. They get away with their fake arguments because the lawmakers are constantly tumbling over each other to curry favor with the brotherhood. These lawmakers don't ask themselves whether the trainmen's statements are sound; but only whether they will hold water long enough to get the governor to sign any old bill they choose to put before him. The trainmen put it over the superintendent not because he does not know better, but because he thinks it best not to start a fight with such an ugly bunch, who are mean enough, any time, to knock him when they go to the general manager—if it happens to suit their purpose to do so.

"I wish they would get some real safety into their legislative grinding machines. They keep on doing everything to please the union, but a bill to promote good railroading in a rational way usually dies from neglect. As to handling freight trains, the question of safety is one for the civil engineers and the accountants to deal with. In theory an efficient crew of six men can sometimes carry out some particular safeguard in a way to make the protection against accidents a hair's breadth more satisfactory than it could be done with a smaller crew; but they can't prove it in practice and any increase or decrease in safety that can be measured, even in your mind, is never discoverable."

Mr. Editor, I forbear to take more of your space; most of your readers know these things already, but I thought perhaps you were not repeating them often enough. How can we get some of these illuminating informal dialogues which may be heard in any state capitol when occasion arises—how can we get them into the printed proceedings? How can the talk of the lobbies be transferred to the halls of justice where the judge and the reporters can have the benefit of hearing them? N. M. JAMES.

NEW LIGHTING ARRANGEMENT IN SLEEPING CARS

CHICAGO, Ill.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I have been interested by the letter signed "Traveler," and those which have followed it, regarding the objections to the upper berths in sleeping cars. I agree with the letter published in the issue of October 19, that the greatest objection to the upper berth is that of light.

It is encouraging to those who spend much time in sleeping cars to know that the Pullman Company is devising methods that will remove the disadvantages of the present lighting system. In my travels I have noticed a new lighting arrangement which has apparently been installed to provide illumination for the floor of the car after the ceiling lights have been extinguished. Some of the installations which have come to my notice have been open to the objection that the floor light was noticeable in the lower berth. In one of the new lighting systems the illumination of the floor has been accomplished by fixtures placed below the end of the seat and this arrangement, in my opinion, is entirely satisfactory. It provides all the light that is required yet would not be noticed by any one inside the berths. The time is probably not far distant when those who prefer the upper berths will no longer be annoyed by the glare of the cluster lights in the car ceiling after they have retired.

OBSERVER.

Eastern Railroads to Be Pooled

To Be Operated Under Committee of Vice-Presidents— Revolutionary Measures Adopted to Relieve Congestion

THE Railroads' War Board on November 24 adopted the most revolutionary measures it has undertaken since its organization in order to relieve the congestion of traffic on the eastern railways. It directed "that all available facilities on all railroads east of Chicago be pooled to the extent necessary to furnish maximum freight movement." The effect of the plan adopted will be that to the full extent that conditions render it desirable these railways will be operated as a unit, entirely regardless of their ownership and individual interests. The operating vice-presidents of the eastern lines have been appointed a committee to operate as a unit all the lines involved and have been given instructions and authority to adopt all measures which in their judgment may be necessary to relieve the present situation and assure the maximum amount of transportation.

An important part of the plan adopted for the operation of the eastern lines is that of placing at their disposal the facilities of railways in other territories to such extent as may be necessary.

The special action taken with reference to the eastern lines is in recognition of the fact that the situation on those lines is more critical than in any other part of the country because upon them is being concentrated the bulk of the fuel and raw materials being used in the manufacture of munitions and also the vast quantities of supplies and food stuffs which are being transported to Europe. Therefore, locomotives, employees and machine tools will be transferred from other railways to the eastern lines, and the repair shops of other lines such as those of the western roads in Chicago, will be utilized for making repairs on the equipment of the eastern lines.

The measures adopted were the result of a series of conferences with government authorities and officers of the eastern lines which the Railroads' War Board initiated on Monday, November 19. The vice-presidents of the eastern railways were called to Washington on Thursday and received from the War Board their instructions for immediate action. On Saturday a meeting was held which was attended by Dr. H. A. Garfield, the government Fuel Administrator; E. N. Hurley, chairman of the United States Shipping Board; Robert S. Lovett, the government priority director, and Commissioner Edgar E. Clark, of the Interstate Commerce Commission, and the Railroads' War Board. At this conference the situation was fully discussed with the representatives of the government, who concurred in the importance of adopting the drastic measures decided upon as the result of the recommendations of the vice-presidents.

The measures the Railroads' War Board and the committee of operating vice-presidents will put into effect at once are as follows:

MEASURES TO BE PUT IN EFFECT AT ONCE

All available facilities on all railroads east of Chicago will be pooled to the extent necessary to furnish maximum freight movement.

All open top cars of all eastern roads and similar cars of private ownership which are at home on eastern lines will be pooled on an equitable plan, distribution under the pool to be made pro rata on the basis of the tonnage carrying capacity of the equipment in the pool. The car pool is to be administered under the direction of the Commission on Car Service.

The Commission on Car Service will divert from those lines where the congestion is most acute all freight that can

be handled by any open route until the congestion is relieved. The pooling of coal will be further extended wherever practicable.

The National Fuel Administration is asked to arrange for supplying the various coal markets from the nearest coal mines in order to avoid waste of car efficiency.

The committee reported that any order that preference be given to any class of cars or freight results in a slowing down of the operation of the transportation machine and that a constant flow of all traffic concurrently produces the best transportation results. The War Board, therefore, emphasizes the desirability of reducing the great volume of government preference orders which, by placing a substantial majority of the freight moved on the same plane, without attempt to classify as to urgency, defeats its own object.

The eastern railways are in serious need of more men and special measures may be necessary to provide them. Some specific illustrations of the way in which the trackage of the various lines is to be pooled are given in the report of the vice-presidents. For example, the Western Maryland will allow its line to be used as an eastbound track in connection with the Baltimore & Ohio from Connellsville, Pa. to Jerome, Md., 125 miles, thus making three tracks between those points. The Erie Railroad is to be used to its full capacity in transporting lake ore and coal between Cleveland and Youngstown, and power and equipment will be provided from other lines for its use as required. It is anticipated that under the new arrangement large amounts of freight traffic will be diverted from the railroads which are now most congested to those which still have some unused capacity.

The Railroads' War Board has been studying with concern the increasing congestion on the eastern lines. It has recognized the fact that the roads in that territory have been becoming overburdened in consequence of the growing industrial activity, of the condition of the labor market, and of other conditions. As part of the programme for relieving these conditions it has addressed a letter to the government Fuel Administration in which it has made the following recommendations:

RECOMMENDATIONS TO FUEL ADMINISTRATION

That a survey be made by the Fuel Administration of present contracts and methods of purchase and shipment of coal so as to shorten the rail haul from mine to consumer and to eliminate as far as possible all cross hauls of coal.

"Pooling of coal within reasonable limits," the War Board said, "will without doubt produce additional large savings, and the railroads are prepared to co-operate in any measures pursued by the Fuel Administration to that end."

That immediate measures be adopted to transfer movement of foodstuffs and other export material to southern and gulf ports to as large a degree as compatible with public interest, in order to relieve the eastern congested territory of an equivalent amount of train service.

That immediate survey be made of all government requirements now involving the movement of raw materials in and manufactured product out of centers of industry, so that accumulations on cars and line and in terminals will not occur as now, while product is awaiting use here or ocean transportation for foreign use.

As the concentration in certain parts of eastern territory of vast government and industrial activities has overtaxed the capacity of rail lines in that territory, considering the heavy movement of coal and other heavy commodities, which

formerly moved on coastwise vessels, but has now been thrown upon the railroads, the heavy military and civilian passenger travel, etc., it is recommended that further enterprises involving large operations in the use of coal and other heavy commodities should not be established in that territory, except after full consideration of these conditions.

In a statement announcing the principal features of the plan, the War Board said: "The measures adopted are calculated to enable the eastern railroads to transport the maximum amount of freight traffic which it would be physically possible, under any organization or by any methods, for them to move with their present facilities."

One of the effects of the congested condition of the eastern lines was explained by Fairfax Harrison, chairman of the Railroads' War Board, in the following statement regarding the car situation:

"Reports to the American Railway Association from all the railroads of the country show that on November first this year the excess of unfilled car orders amounted to 140,012 cars, an increase of 25,104 cars over the same day last year. Of this number, 97,000 cars are called for in other parts of the country than the congested region east of Chicago and north of the Potomac river where the abnormal war business is heaviest. Many of these orders for cars could be filled if the cars now delayed in the congested regions could be released. The Railroads' War Board is now applying extraordinary remedies in the endeavor to accomplish this."

The operating officers of the eastern lines met on Monday at the headquarters of the Railroads' War Board in Washington and created a committee which will be in full charge of the operation of the railway pool. A. W. Thompson, vice-president of the Baltimore & Ohio, was made chairman. The other members of the committee are C. R. Gray, president of the Western Maryland; A. T. Dice, president of the Philadelphia & Reading; P. E. Crowley, vice-president of the New York Central; Elisha Lee, acting vice-president of the Pennsylvania Lines East; G. L. Peck, vice-president of the Pennsylvania Lines West, and A. J. Stone, vice-president of the Erie.

The committee will establish headquarters in Pittsburgh at once and will sit continuously until the entire traffic problem produced by the abnormal war business in the district east of the Mississippi and north of the Potomac and Ohio rivers has been solved.

THE PENNSYLVANIA'S INVESTMENT IN NEW YORK CITY

Samuel Rea, president of the Pennsylvania Railroad, replying to criticisms in a New York daily paper, gives some data connected with the reasons why the road saw fit to build so grand and extensive a passenger station in the heart of New York. He says:

The Pennsylvania station, instead of being a monument to inefficiency and waste, and a white elephant, is a monument to foresight and the necessities of New York City and the whole country with which it does business, and more especially so for the Pennsylvania Railroad system, whose passenger revenues are about 20 per cent greater than the next largest railroad system of the country. Its revenue passenger mileage is about $13\frac{1}{2}$ per cent of the whole country, notwithstanding it constitutes only about $4\frac{1}{2}$ per cent of the country's mileage. Its ton mileage is also larger than any other and is nearly 13 per cent of the entire ton mileage of the nation's railroad systems; and that ton mileage doubles every twelve years, necessitating the construction of separate passenger lines and passenger facilities.

The station was constructed for the future and primarily for the long-distance passenger travel to and from New York,

New England and the Southern and Western States, the local and suburban traffic to New Jersey being accommodated through the joint service so successfully inaugurated between Newark and New York through the Hudson Tunnels. This line is handling about 200 per cent more passengers than in its first year of operation. Pennsylvania station was opened seven years ago and in the first year's operation 9,862,434 passengers arrived and departed from it, whereas in the last year this has grown to 18,135,311 passengers.

You say that not for years will its handling capacity be completely utilized. What would the public say of a management with an actively expanding business which built for the present only? That station is built for the present and for the years to come, and is so adapted as to handle the increasing traffic of the Pennsylvania and its Long Island railroads and also such traffic as the New Haven will put into and through it; and when justified, more tunnels may be built, the station and yard facilities being adequate therefore. Does the public realize that Broad Street station, Philadelphia, which is served by several double-track railroad lines, running in every direction, has been opened for 36 years, and Pennsylvania station only seven years, and that the latter handles about as many passengers, and has larger revenue from passengers?

Did you stop to inquire why this terminal was built alone by the Pennsylvania Railroad system, or why that system had to determine, at the time it did, to extend into and through New York or forever terminate on the west bank of the Hudson? The building of this great work now would, by reason of its cost, be prohibitory. Until electric traction for steam roads was developed, no responsible railroad would approve of tunnels under the Hudson (for steam traction). Between 1890 and 1900 when the North River bridge was projected, a federal charter was procured to have it open to all railroads, and the Pennsylvania actively worked for its realization. In 1900 its directors agreed to use the bridge when built and guaranteed its share of traffic at an agreed rate, provided the other railroads would join. None of the other railroads did join, and while the matter was pending, electric traction on the Orleans railroad tunnel extension in Paris was inaugurated, whereupon the Pennsylvania turned its attention to tunnels. It incorporated its tunnel railroad system, purchased a majority of stock of the Long Island Railroad, constructed the extension and erected the Pennsylvania station; and since then has built the New York Connecting Railroad jointly with the New Haven. The whole project, outlined sixteen years ago, including vast improvements, passenger and freight, and also those of the Long Island Railroad, has been carried out and devoted to public use. The Seventh Avenue subway, long projected and which we had hoped would be completed when our station was opened, is now nearing completion and will be opened soon to accommodate our passengers.

How would this great improvement have been secured otherwise? Would the city of New York have obligated itself for the cost, and the interest thereon, for a station for all the railroads, on the possibility that they would use it? Let me express the opinion here that a union station could not be built in that huge city that could conveniently accommodate all the rail traffic. If attempted, the cost, and the congestion around it, and on the approach streets, would make its useful operation impracticable.

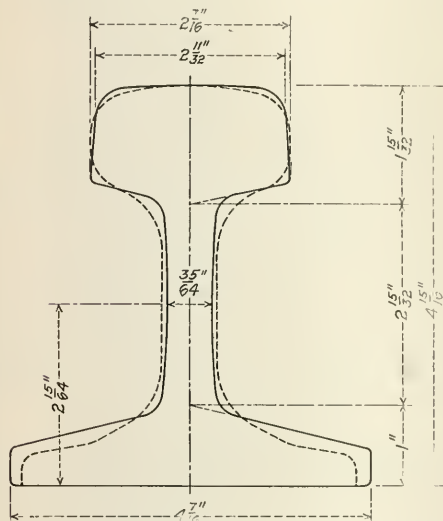
As to co-operation in the development of the facilities of the port of New York, notwithstanding our railroads have in the past been reared on competition, and for most of the time unreasonable competition, and that they have fairly been compelled by state and federal laws to compete, if such compulsion be possible, they are today, in time of stress, co-operating to a degree never dreamed of and second to no other industry, and serving their government nobly. * * *

Track Work for United States Army in France

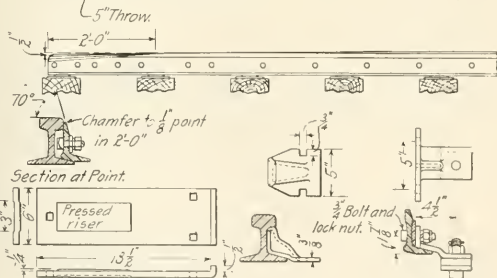
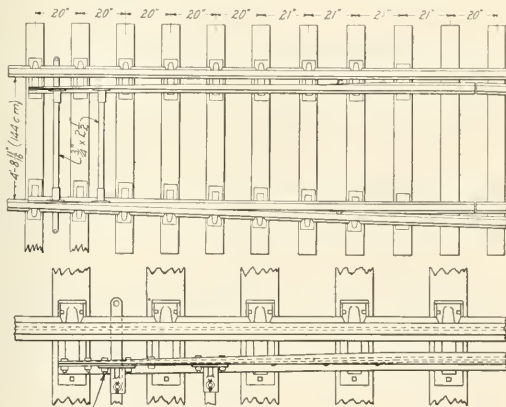
Special Designs of Frogs, Switches and Crossings Prepared to Meet Special Conditions in That Country

A COMPLETE set of standards for special track work including frogs, switches, crossings and cross-overs has been developed for use on the railways which the United States forces in France have taken over. The magnitude of the requirements of this character is indicated by the fact that 5,000 turnouts alone were specified in the first order. The designs for this work were prepared under the direction of S. M. Felton, director general of railways

better proportioned. The "B" section was selected because of its very heavy base, the government desiring to avoid chances of breakage on account of the rough handling the rail would be subjected to. The rails are laid to the French gage of 4 ft. 8 11/16 in. (144 cm.) and the narrow gage military railways use 25-lb., A. S. C. E. rails laid to a gage of 1 ft. 11 3/8 in. (60 cm.). The first standard determined upon was a No. 8 turnout having a 16-ft. 6-in. switch, a No. 8 rigid frog and an 11-ft. guard rail, the No. 8 turnout being adopted because it is not contemplated that any of these tracks will be used for high speed movements. As the work progressed a ground-throw switch stand was determined upon and also No. 8 single and double-slip switches, with the alignment according to the American Railway Engineering Association typical layout, as given in Vol. 17 of the Proceedings for 1916. The government



Full Lines Show A. R. A., 80 lb. Rail, Type B, Adopted for Use in France. Dotted Lines Show Rail Used by North-eastern Railway of France and State Railroads of Belgium



16-ft. 6-in. Split Switch

also called for additional turnouts for No. 12 and No. 6 frogs and also for a number of crossings of angles of 45, 60, 75 and 90 deg.

TURNOUTS INVOLVE NEW FEATURES

One of the drawings shows a standard 16 ft. 6 in. switch in which the switch and stock rails are supported on pressed steel slide plates, 5/8 in. thick by 6 in. wide, with pressed risers and with shoulders to hold a pressed steel rail brace. (The manufacturers were given the alternative of providing

for the United States Army. He was assisted in the preparation of the plans by A. H. Mulliken, president, and other members of the Manganese Track Society.

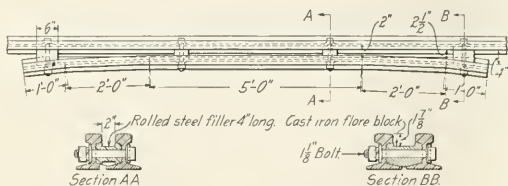
DETERMINATION OF THE DESIGNS

The main considerations which influenced the designs were: (1) Safety for standard railroad traffic based on American railroad practice; (2) Economy and simplicity in design to admit of quick production in large quantities for any emergency that might arise; (3) Standard sizes of materials that are carried generally in stock or are most readily procurable, and (4) American Railway Engineering Association standard layouts, with switches and frog details developed to meet the above conditions. An effort was also made to eliminate unnecessary cutting of rail in the manufacture of this special work.

It was necessary to proceed with the work before any really tangible information was available concerning the actual requirements or the nature of the track standards. Some information was obtained regarding materials which the French railways had obtained in this country previously which served as an approximate index. The 80-lb., A. R. A., type "B" section of rail was adopted rather than the French type, being of the same height as the French rail but

$\frac{1}{2}$ -in. slide plates with solid braces of malleable iron.) Two $\frac{3}{4}$ -in. by $2\frac{1}{2}$ -in. connecting rods are attached to the switch rails with pressed steel open side pockets. The switch rail is braced by $\frac{3}{8}$ -in. reinforcing bars, 13 ft. 5 in. long. The throw is 5 in. and the heel distance $6\frac{1}{4}$ in.

The frog embodies a number of interesting features. It is built of standard 80-lb. rail with cast iron throat blocks, rolled steel fillers and a heel riser made of a rail with the head and base pressed to the desired shape. The design of the point is a special feature. The web and base of the point rail extend 4 in. beyond the actual point, the head being cut away on a curve of 15-in. radius. This arrangement has the advantage that an additional bolt can be passed through the point rail and the fillers and it eliminates the notches in the fillers at the point of frog. Another effective



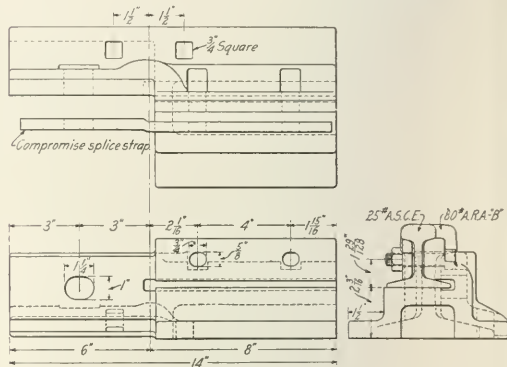
Details of the 11-ft. Guard Rail

detail is the planing of the flares in the heads of the wing rails in place of producing the flare by bending the entire rail. The advantages of this are that the standard rolled fillers can extend to the end of the wing, thereby eliminating the foot guard and that additional strength is secured by the use of bolts near the extreme end of the wings. The length of the frog is 13 ft. 6 in.; the bolts are of $1\frac{1}{8}$ in. open hearth steel; the throat distance is $1\frac{1}{8}$ in. to $2\frac{3}{4}$ in. and the flangeway is $1\frac{3}{4}$ in. wide.

The guard rail was made 11 ft. long to secure three of them from a 33-ft. rail. It has a compound flare, the main flare being $\frac{1}{2}$ in. in two feet and the end flare $1\frac{1}{2}$ in. in

plete with bolts and fillers in place and there is no opportunity for the loss of any parts.

Drawings were also prepared for a standard No. 8 turnout and a No. 8 crossover. These correspond very closely to the standard plans given in the Manual of the American Railway Engineering Association. The lead, tie spacing and other principal dimensions are identical, but in general the ties of the government turnout and crossover are 6 in. shorter than those shown on the American Railway En-

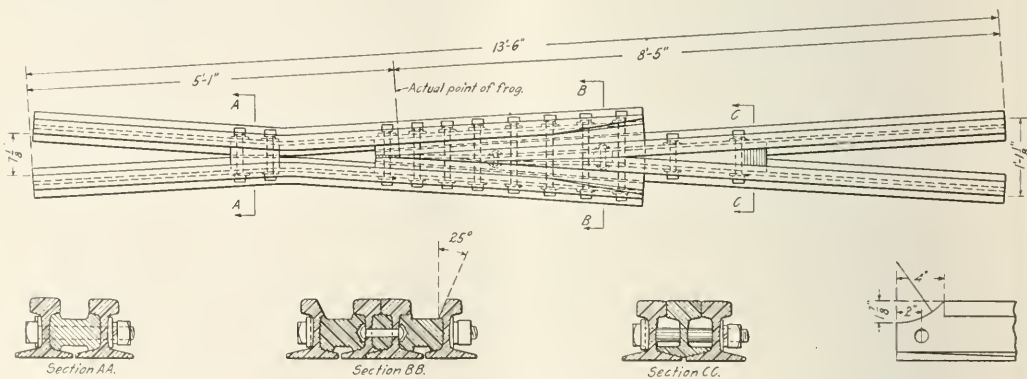


Compromise Joint for 25-lb. A. S. C. E. and 80-lb. A. R. A. Type B Rails

gineering Association plans. The standard switch stand is of the dwarf, parallel, ground-throw, Mansfield type, without provision for switch locks. The cover casting bears the marking 1917, U. S. A.

THE CROSSINGS ARE INTERCHANGEABLE

In connection with the crossings an intricate problem arose from the fact that the government engineers could



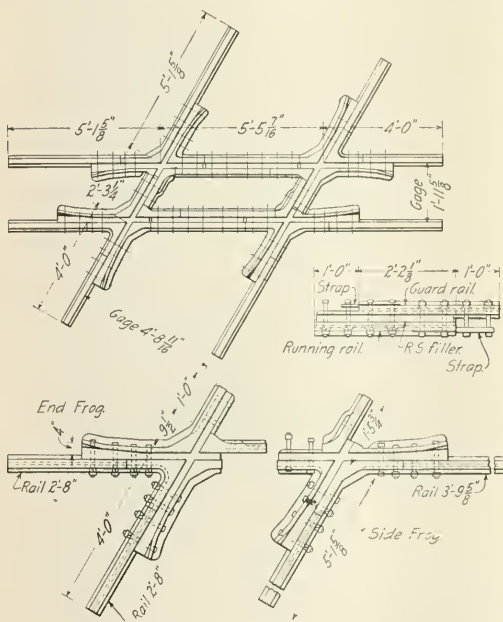
No. 8 Rigid Frog

one foot. The guard rail is secured to the running rail by four $1\frac{1}{8}$ -in. bolts with cast iron flare blocks at the end and rolled steel fillers 4 in. long for the intermediate bolts. The use of guard railclamps was considered when the design was being made but it was decided that it would be unwise to employ them for the service imposed because of the difficulty that might arise from the loss of loose parts of clamps. With the type selected, the guard rail can be shipped com-

not definitely determine the number which should be right hand or left hand, the principal crossing requirements being for the passage of narrow gage tracks over those of standard gage. In consequence of this situation it was deemed highly desirable to work out some scheme by which the crossings could be made reversible, that is, designed in such a way that they could be changed from right to left hand by a reassembling of the pieces. After a study of the

problem, the conclusion was reached that this could only be solved in a practical way by making the angular crossings of cast manganese steel. In general it was the idea in connection with this track work that the conditions imposed by the service did not demand the use of manganese steel, but owing to the peculiar problem imposed in the crossings an exception was made in that case.

One of the drawings shows the details of the 60-deg. crossing and illustrates how the special requirements were secured. Each crossing consists of two manganese steel end frogs and two manganese steel side frogs. The interior arms of these frogs are of such length that, when directly connected, they produce a complete crossing of one narrow gage (60 cm.) track over another. However, two sets of connecting rails are provided with each crossing, each connecting rail consisting of a running rail, guard rail and filler. When these are inserted between the frogs on the



Reversible Manganese Crossing

rails of one track, the crossing becomes standard gage for the opposing track. The crossing can be made right hand or left hand, depending upon which pair of the rails these connecting rails are inserted in. By procuring two more sets of connecting rails the crossing can be made standard gage for both tracks.

It is expected that most of the narrow gage track used in France will be of the portable type fabricated in sections with steel ties, each section of track having square ends. To facilitate the connection of such tracks to the crossings the exterior arms of the crossings are fitted with short sections of rail of such length that square ends are secured, when either or both tracks are for narrow gage.

The crossings were detailed to correspond to 80-lb. A. R. A., type B rail and as connections must be made in the narrow gage track to 25-lb. A. S. C. E. rail, four sets of compromise joints were provided with each crossing. This unusual jump in the sizes of rail called for the design of a compromise joint that is rather out of the ordinary and it is shown in one of the drawings.

SLIP SWITCHES

In the single and double slip switch designs, the frogs and switches are duplicates of those for the standard No. 8 turnout. The plan also provides that the joint in the stock rails coincide with the heel of the switch rail so that the two joints can be made with the use of a common 22-in. cast iron heel block. Provision against rail creeping is made by means of a 1/2-in. by 2-in. by 4-ft. 4-in. anti-creeper attached to this joint and extending over three ties. The knuckle rails and movable points are reinforced with easier rails. Both the double and single slip switches are provided with double hand throw devices interlocked to insure that the movable points will be in proper position for the routing given by the position of the switch point.

THE RECONSIGNMENT PRIVILEGE*

By H. W. Johnson

Superintendent Freight Loss and Damage Claims, St. Louis-San Francisco

That the reconsignment privilege granted by carriers in their tariffs is a pernicious form of rebate is a statement which is hardly justifiable—that it has become a part of the commercial customs of the country or rather a commercial necessity, is well taken. That the reconsignment privilege is abused very frequently and, in fact, so often that it is a distinct detriment to the shipping public and the railroads throughout the country is a fact which anyone dealing with the various phases of this subject during the past few years will not deny. In order to set forth the abuses to which this privilege has been subjected, it is first necessary to outline what may reasonably be considered the intent and legitimate purpose of the privilege, which I believe is fairly stated in the following:

(1) Time consumed in transit is saved to the shipper. Under the reconsignment privilege, shipments may be forwarded in the general direction of the market, billed to the shipper or his agent as the consignee, thus the shipper, instead of holding his product at the point of origin, has it at or en route to the market where the prospective purchaser may inspect it, thus facilitating sale, having shipments at point where delivery may be made promptly and incidentally relieving the shipper's warehouse or storage facilities.

(2) Through the reconsignment privilege, shippers are enabled to dispose to a good advantage of shipments that are refused at destination through no fault of the shipper or carriers.

(3) By the privilege of reconsignment, in the issuing of exchange bills of lading, shippers and consignees are enabled to conceal the name of either the shipper or the consignee as well as the source of supply or the location of the demand.

It follows, therefore, that all practices contrary to these are abuses of the reconsignment privilege, such as:

(1) Holding shipments in cars an unreasonable length of time after arrival at destination for purpose of speculation on rising markets.

(2) The intention of the application of certain rates may be defeated and a monetary advantage may be realized in some instances, which was not contemplated when the reconsignment privilege was published and the rates were made, in the following manner:

Where tariffs allow certain commodities the privilege of intermediate markets, for instance, live stock, which unloads at a given stock yards ostensibly for feed and rest and for the privilege of the market, are forwarded to destination by change of waybill heading and on through rate. The abuse

*This is one of the papers submitted in the Reconsignment Privilege Contest. The two prize winning papers have previously been published.

may consist of live stock having actually been sold and no record thereof given to the railroad company, or substituting other live stock in place of the original shipments.

A broker at a given concentrating point purchases a shipment for a client in another city and reconsigns the shipment that has arrived at the concentrating point to the final purchaser, on basis of the through rate, which in many instances is the same rate as that which has already accrued up to the point of reconsignment; the broker can thus make a profit on what would have been the local rate to the ultimate destination, provided shipment had actually been purchased at the reconsigning point, and reshipped under new contract to final destination. This occurs on such commodities as grain and hay.

(3) Under the reconsignment privilege on shipper's order shipments, a broker may do business on capital invested in shipments that are in transit and have not been actually sold to the consignee by drawing draft upon a prospective purchaser and in case original purchaser does not accept shipment, the reconsignment privilege permits the broker to draw another draft upon another prospect.

(4) During the past few years, since the carriers have undertaken to enforce rules and regulations between themselves governing the use of cars in accordance with the ownership of the equipment, permitting them to be loaded only in the direction of the car owners, the reconsignment privilege has enabled shippers to defeat these regulations in a great many instances by billing shipments to a point to which they are allowed to be loaded, then change the final destination, contrary to the regulations referred to, which privilege cannot be denied to shippers under reconsignment tariffs.

A specific instance that has come to my attention recently of what might be termed an abuse or at any rate a very excessive use of the reconsigning privilege is a carload of potatoes billed from A, a point in the far West on road A, February 15, arrived at B, first destination on road B, February 23; reconsigned February 26, arrived at C, second destination on road C, March 1; reconsigned March 7, arrived at D, third destination on road C, March 9; reconsigned March 10, arrived at E, fourth destination on road C, March 11; reconsigned March 14, arrived at F, fifth destination on road D, March 16; unloaded March 23. This shipment occupied the car 36 days, during which time, it was held for reconsignment an aggregate of 20 days. I believe it is safe to say that not more than \$10 demurrage was assessed during the entire time, allowing for free time and time to transmit notice to the shipper and secure disposition in each case. It is my understanding that the tariffs of none of the railroads in question provided for a reconsigning charge.

The result of abuses of reconsigning privilege as stated are obvious, and consist principally of the following:

Holding cars out of service unduly, for which only a nominal charge for demurrage or car service can be made. Even the demurrage charges are defeated by the abuses of reconsigning privilege in that the shipper may, in order to prolong the time in transit, name several destinations, and have car set out at each destination. The shipper is released from any payment of any car demurrage charges by giving another destination within 24 hours after he is notified that shipment has reached last named destination. This is particularly noticeable in connection with the handling of fruit and vegetables on which there is no reconsigning charge. Delay is also accomplished after car reaches destination by simply having car re-switched a number of times, paying a nominal charge for the switching service, which is far less than the advantage accruing through delay necessary to switching cars across and through terminals, which are sometimes congested, requiring considerable time. This is especially true on rising markets. In this connection,

the Interstate Commerce Commission holds the view that, without specific qualification, the term "Reconsignment" includes changes in destination, routing or consignee (Administrative Rule 7). Thus consignees are allowed additional free time under the demurrage rules when cars are held for any of these purposes.

This result is naturally accompanied by the further far-reaching and expensive detriment of unduly occupying railroad tracks and terminal facilities which should instead be used for the purpose for which they were built. Another result of these abuses is the extra handling of cars in switching out of and into trains at reconsigning points and shifting to and from designated tracks in terminals, including the expense incident thereto.

The final result of these abuses is to occupy railroad facilities unduly, thus limiting them for service for which they were intended, and causing inconvenience to the shipping public and loss to the railroads.

I am of the opinion that the cause of these abuses is twofold, first the construction of the rules and regulations governing, which, however, is not necessarily faulty, but impracticable of application to all conditions; second, the small amount charged or the absence of charge for reconsignment, for switching, and car handling incident thereto as well as for demurrage and track rental while cars are held for reconsignment.

In connection with the former, every condition should be set forth (some of which are not now covered) in the rules and regulations, in order that an adequate charge may be published to cover.

In connection with the latter, there is no charge for reconsignment of fruit and vegetables over a large part of the country; there is no reconsignment charge for coal and certain other commodities when reconsigning orders are given before shipments reach destination, or within a specified time thereafter.

Reconsignment charges that are made are entirely inadequate to cover the expense, to say nothing of a penalty that should in my opinion be imposed upon practices that are apparently unjustified. Switching charges at terminals are generally so low that it is very often profitable for the consignee to have his shipment re-switched a number of times in order to gain the time necessary to handle the car through terminals. The time allowed under car demurrage rules free of charge, on cars held for reconsignment or re-switching, is very often too great, especially when connected with other free time. The demurrage charge itself on cars held for reconsignment is entirely too low.

The remedy necessary to reduce the reconsigning privilege to a point where it will best serve the shipping public is an adequate charge for services rendered in connection therewith, including reconsigning charge, switching charge, car demurrage charge, etc. Such charges, in order to prevent or at least discourage some of the abuses to which the reconsigning privilege is subject, should be so constructed as to place a heavy penalty upon those abuses, as for instance, a charge equal to twice the ordinary charge should be made for a second reconsigning; demurrage rates on cars held for reconsigning should be much higher than the rates applicable to cars held for loading and unloading, especially after the first 24 hours, and should be graduated to a higher scale each day thereafter, until cars are released; each abuse, where possible, should be taken care of in a like manner.

TIES BOUGHT IN CANADA IN 1916.—A total of 7,572,878 ties were bought by Canadian railways in 1916, according to a bulletin of the Interior Department's Forestry Branch, based on reports received from 34 companies. The average value was 42 cents a tie as compared with 7,399,753 ties bought in 1915 at an average of 44 cents a tie.

The Railway Situation in Russia

Henry Miller, of the Railway Advisory Commission,
Describes Conditions and Gives Recommendations

A MUCH more optimistic view of the Russian railway situation than that which has become prevalent in the United States has been brought to this country by Henry Miller, formerly operating vice-president of the Wabash, who went to Russia in June as a member of the United States Railway Advisory Commission, and has just returned with a report. The commission, of which John F. Stevens is chairman, was accredited by the State Department and was sent to Russia to advise with and assist in every practicable way in the handling of the grave transportation problems which the war had thrust upon the Russian railway system. It has made a thorough investigation of the situation, made many suggestions for improved methods which have been adopted by the Russian railway authorities and has arranged for the despatch of railway materials and supplies from this country to Russia. At its recommendation, the Russian Railway Service Corps, consisting of 350 experienced railway operating and mechanical officials, has been recruited in this country under the direction of S. M. Felton, director general of railways, and sent to Russia to assist in the operation of the railroads and to act as instructors to Russian railway men for the purpose of building up a more efficient operating organization.

Some interesting information regarding the present condition of the Russian lines and the commission's recommendations were given by Mr. Miller in an interview with the *Railway Age Gazette* while he was in Washington last week making his reports to the railway and governmental authorities.

PHYSICAL PROPERTY EXCELLENT

"Russia is blessed with abundant crops and ample live stock and other foods and has resources beyond conception," said Mr. Miller. "The fear that the railways will fail to keep the army and civil population supplied is unfounded and has been dispelled by the American Railway Commission, who, after full investigation, during which the track, locomotives, cars and other facilities of the main trunk lines were examined, became convinced that by supplementing and reinforcing the operating department, together with the additional locomotives, cars and spare-parts now arriving from America, the transportation system of Russia will fulfill all reasonable requirements. The condition of the railways has been grossly exaggerated. Like our own, they are at present overtaxed with unusual traffic, but in many respects they are quite all right and their physical property and terminals are excellent.

"For instance, Moscow, the 'Hub' of the nation, has a well constructed belt line that has no superior anywhere, encircling the whole city connecting the nine railways radiating from there like spokes in a wheel, with commodious interchange yards at all intersections and no congestion of traffic of any consequence to interfere with the free movement of trains.

"The reports showing 25 per cent to 30 per cent of the locomotives 'sick' on the Russian railways is a fiction of the statistics largely, caused by the order to classify as 'sick' those needing repairs requiring withdrawal from service 12 hours or more, thus including mere running repairs. A rational analysis of the situation on the Trans-Siberian Railway reveals not exceeding 15 per cent of the locomotives 'sick' under a proper classification based on the practice of American railways."

The commission arrived in Petrograd on June 13 after a

ride of 6,000 miles over the Trans-Siberian Railway from Vladivostok and its members were then taken on a trip over the railway lines in the heart of European Russia, from Petrograd to Moscow, south into the coal fields and back by way of Kiev, this circuit taking them into the territory just back of the fighting front. The first problem undertaken was to work out a plan for expediting the transportation of supplies into Petrograd and to the army, and the next task was to arrange for the movement of coal into the city of Moscow, a great traffic center served by nine railroads, and Warsaw.

OPERATING METHODS REORGANIZED

"As far as the railways are concerned," said Mr. Miller "we found the great problem to be a question of operation. The physical properties are all right. As one of the first steps, we arranged to divide the railroads into divisions of approximately 300 miles, each in charge of a superintendent and a staff of 13 assistants, including trainmasters, train despatches, master mechanics, traveling engineers, etc., in order to provide the close supervision necessary to promote efficiency. We found that their practice was to operate their engines and crews on short turn-around trips. The men were assigned to their engines, which practice resulted in a very small mileage for each locomotive, because when the men needed rest or laid off on account of sickness or for other causes the engine was also taken out of service. By a plan of pooling the men and their engines the locomotive mileage was immediately doubled and the capacity for handling traffic was largely increased, so that it became possible with the existing power and facilities to clear up most of the congestion by the end of August. The railways are now clear and effective operations have been established over the whole system.

EQUIPMENT

"Russia has approximately 50,000 miles of railroad, of which about 60 per cent is owned by the government and about 40 per cent privately owned. The railroads have about 20,000 locomotives, whose average age is 24 years, most of them being compounds. About 10 per cent are wood-burning, 5 per cent oil-burning and the balance coal-burning. They have an average tractive force of 18,000 lb. We found about 15 per cent of the locomotives in bad order. They also have 580,000 freight cars of an average capacity of about 16 tons, of which we found about 8 per cent in bad order. The freight cars, both on the government lines and the privately-owned lines, are pooled and handled by a central car distributing office at Petrograd. The practice is to apportion a certain number of cars monthly to each of the lines based upon their traffic requirements as determined by previous experience.

"About 20 per cent of their freight cars have brakes and only the 13,000 American-built cars are equipped with air-brakes. Braking is done by hand, the practice being to use a brake van for every fifth car in a train and to station a brakeman at each brake.

"The Trans-Siberian line, including a detour line just constructed via the Amur river, is practically all double-tracked from Vladivostok to Omsk, a distance of about 4,000 miles. At Omsk the line divides in the form of a Y with branches extending to Petrograd and Moscow and the traffic is correspondingly divided, so the Trans-Siberian line is practically equivalent to a complete double track line.

"The Russian railroads are operated after the German

system, which differs from the American system in that train movements are not governed by time tables or train schedules, but trains are classified and their rights on the road are governed by the conductors and engineers. Time tables are only for the information of the public. There are no train rules or other operating rules corresponding to the American code of train rules and no train orders are issued except for slow orders. Trains are operated by the staff system on single track and by the telegraph manual block system on double track. The absolute block system is used in spacing trains.

"There is almost an entire absence of what in America is termed the operating department, and it is this void that the American commission has attempted to fill in order to increase the efficiency of the railways. It is for this purpose that the corps of 350 experienced railroad men from the United States has been sent to Russia to carry out the recommendations made by the commission and to act as instructors to the Russian railway men in American railway operating methods. It is hoped that by this means it will be possible to build up an efficient organization from among the Russian railway men themselves."

RAILWAY AGE GAZETTE PATRIOTIC WAR NUMBER USED AS HANDBOOK

Mr. Miller took occasion to make some flattering comments upon the Patriotic War Number of the *Railway Age Gazette*, which was issued on June 22. "The *Railway Age Gazette* War Number was used as a handbook by the American Railway Commission," Mr. Miller said. "Many of the things that were set out as being necessary to increase the efficiency of American railways were similar to those advocated by the commission for the Russian railways. Special Commissioner Oustrougoff, who was appointed by the Provisional Government to put our recommendations into effect, read it with the greatest interest, and requested that he be permitted to keep the copy for his information and guidance, his intention being to have some of the articles translated for distribution and use on the Russian railways."

Many of the recommendations and findings of the commission are set forth in a "Fourth of July proclamation" issued by the commission at Petrograd for the purpose of conveying to the Russian people a message regarding its purpose and the desire of the people of the United States to co-operate.

This statement was as follows:

THE COMMISSION'S PROCLAMATION TO THE RUSSIAN PEOPLE

"The United States Railway Advisory Commission is accredited by the State Department of the United States to its ally Russia. The object of the commission is, as has been stated, to advise with and to assist in every practicable way in the handling of the grave transportation problems which the war against a common enemy has thrust upon the railways of Russia.

"It seems fitting that upon this, the anniversary of our natal day of Independence, this commission should convey to the people of Russia a message declaring not only its purpose but also something as to what it has accomplished and which it is believed will cheer the nation and convince it that the United States stands shoulder to shoulder with its great ally in the prosecution to a successful conclusion of the war against the venomous enemy of democratic freedom.

"The commission has been in Russia about five weeks. During this time it has met with the officials of the Russian railways and has discussed fully and freely the various problems confronting the railways. It has been met everywhere and at all times with the utmost spirit of cordiality

and co-operation on the part of those officials. It has found, what was no surprise to it, that as masters of technique the Russian railway officials have no superiors in the world. It has found that in many ways their practices are among the best and that from a basic standpoint the Russian railways are intrinsically sound—backed as they are by the enormous latent resources and the vast population of this wonderful country.

"At the same time, it believes that a judicious mingling of the best Russian and American railway practices will be of great benefit to the railways of Russia, and in this belief your officials are in hearty accord and have given their approval to the following suggestions made by this commission:

"An improved system of train operation, a better divisional organization, whereby closer supervision can be maintained, and a revision of engine runs whereby a greater capacity of each engine and car can be obtained, resulting in an improvement in the movement of traffic.

"The construction of locomotive erecting shops at Vladivostok where the immense number of locomotives coming from the United States can be erected and put into service much more speedily than has been the practice heretofore.

"The working day and night of all locomotive repair shops so that the great number of out of repair locomotives may be reduced and that they may be put into service where they are so urgently needed.

"That the 'per diem' rate, or charges of one railway against another for the use of cars, be doubled, and that also the charge for holding cars for loading or unloading be doubled. This to insure prompt handling and release of cars in a reasonable time.

"That a supply department under a general storekeeper be installed, who shall be responsible for the maintenance and distribution of the vast amount of material and supplies needed for the operation and maintenance of the roads, the duties of such officer to include the reclamation of worn material and the reissuing of such as may be found serviceable.

"But the great imperative immediate necessity which confronts the railways of Russia to enable them to not only maintain its armies at the front, but also to support in comfort its civil population, who equally with its soldiers are fighting the great battle for freedom, is a great increase in the number of locomotives and freight cars. On this point the commission are entirely in accord with the railway officials and with the Russian people. To the end that this absolutely necessary want shall be supplied as quickly as can be done, this commission has cabled the Administration at Washington advising the immediate construction of 2,500 locomotives and 40,000 freight cars to be added to the equipment of the Russian railways.

"This means, of course, an extension of credit by the United States to Russia of some 750 million roubles. This matter has no commercial aspect for the commission has pledged what to it is dearer than family or life itself, the good faith and honor of its country.

"The commission has under further consideration the furnishing of raw material, tools and shop machinery to any extent that may be found advisable after careful consideration with the Russian officials, and stands ready to aid with its advice and counsel in any and all matters wherein it may be requested.

"In closing, it desires to express its hearty appreciation of the aid given it by the efficient Minister of Ways of Communication and his staff of able assistants. It knows that in their hands the future of the Russian railways is secure and it believes with the aid and material assistance which the United States is giving to its great Ally, that Russia will continue to sustain its part in the desperate struggle for freedom which is now convulsing the world."

Refrigerator Cars for the Baltimore & Ohio

The Insulation Applied Without Intervening Air Spaces;
A Free Circulation of Air Permitted Around the Ice

THE Baltimore & Ohio has recently constructed in its own shops some refrigerator cars that contain many interesting and new features of design. Contrary to the customary practice the insulation throughout the car is applied without any air space between the different layers. The purpose of this arrangement is to eliminate the so-called dead-air space and to better support the insulation. It has been found that it is difficult to maintain a tight car with the layers of insulation separated, because of the constant weaving of the car and further that the only *real* dead-air space is in the insulation itself. By applying the various layers of the insulation directly on themselves the construc-

tion of the car is less complicated and the insulation can be better supported and it will not deteriorate as rapidly. A careful study of refrigerator car design has also shown that the material in a car will be better refrigerated if the air in the car has a direct and positive circulation. To obtain this the bulkhead of the ice chamber was made solid with ample openings at the top and bottom and the load is held above the floor on racks. To obtain greater effectiveness from the ice, a wire netting is provided to hold it which permits a free circulation of the air around it. With the ice thus held away from the sides and end of the car, less

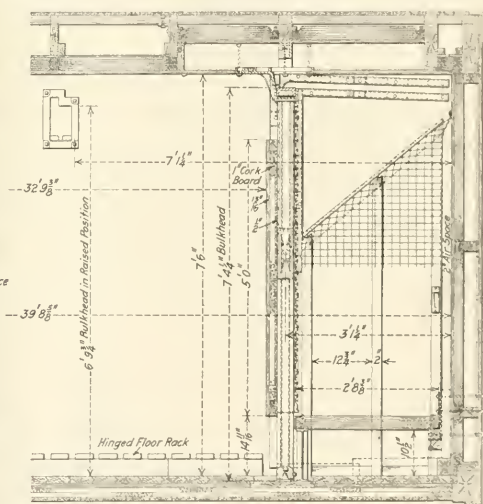
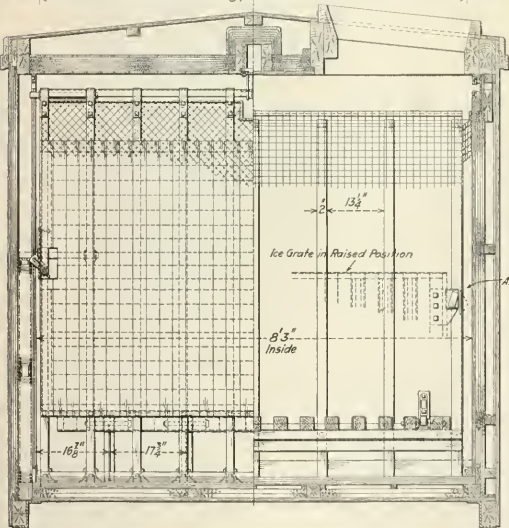
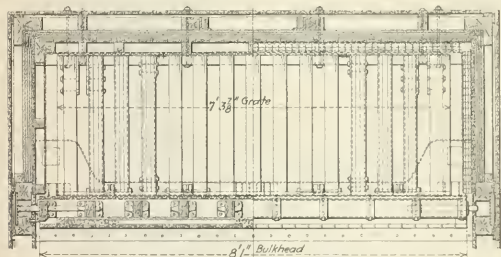
heat is absorbed through the car walls. The bulkhead is insulated so that it too will not transmit heat to the ice, but instead will guide the cold air down to the bottom of the car for circulation. The insulated bulkhead is of further benefit in that it prevents to a large extent, the condensation of moisture on the car side of the bulkhead which is liable to spoil the material placed against it.

These refrigerator cars are of 70,000 lb. capacity and weigh 54,800 lb. They have the following general dimensions:

Length inside	39 ft.	8 $\frac{3}{4}$ in.
Length between ice boxes	33 ft.	7 $\frac{1}{2}$ in.
Length of outside over body	40 ft.	10 $\frac{3}{8}$ in.
Width over siding	9 ft.	3 $\frac{3}{4}$ in.
Width inside	8 ft.	3 in.
Width at eaves	9 ft.	5 $\frac{1}{2}$ in.
Maximum width over side ladders	9 ft.	9 $\frac{1}{2}$ in.
Height inside, floor to ceiling	7 ft.	6 in.
Height from rail to top of brake shaft	13 ft.	10 $\frac{1}{2}$ in.
Distance from center to center of trucks	31 ft.	8 $\frac{1}{4}$ in.
Wheel base of truck	5 ft.	4 in.
Size of journals	5 in.	by 9 in.
Height from rail to top of floor	4 ft.	11 in.
Width of side door opening	4 ft.	0 in.
Length over end sill channels	41 ft.	11 $\frac{1}{2}$ in.
Length over striking casting	42 ft.	8 $\frac{1}{4}$ in.

CAR FRAMING

The underframe was furnished by the Ralston Steel Car Company. It is made entirely of steel, consisting of pressed and rolled shapes. The center sill is a fish-belly girder 2



Sections Through the Ice Bunkers, Showing the Insulated Bulkhead

tion of the car is less complicated and the insulation can be better supported and it will not deteriorate as rapidly.

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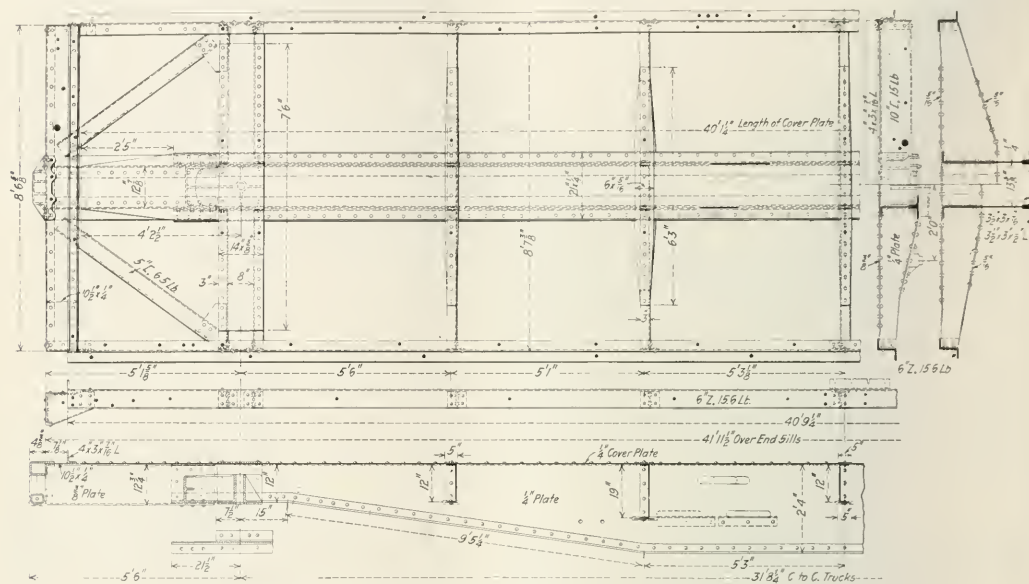
ft. 4 in. deep at the center and 12 $\frac{3}{4}$ in. deep at the ends. The webs are of $\frac{1}{4}$ in. plate, flanged outward at the top to receive the coverplate. They extend a short distance back of the body bolsters where they are riveted to the $\frac{3}{8}$ -in. draft sills. The coverplate is 21 in. wide by $\frac{1}{4}$ in. thick and extends between the end sills. The bottoms of the center sill webs are reinforced by 3 $\frac{1}{2}$ -in. by 3-in. by $\frac{1}{2}$ -in. angles on the outside and 3 $\frac{1}{2}$ -in. by 3-in. by 7/16-in. angles on the inside. The body bolsters are $\frac{1}{4}$ -in. pressed steel pans shaped to fit into the center and side sills. They have 14-in. by $\frac{3}{8}$ -in. top coverplates and 14-in. by $\frac{1}{2}$ -in. bottom

coverplates. The crossbearers are $\frac{1}{4}$ -in. pressed steel pans with 5/16-in. top and bottom coverplates. The side bearings are located on 48-in. centers.

The end sills are 10-in., 15-lb. channels, reinforced at the top by 4-in. by 3-in. by 7/16-in. angles set $7\frac{1}{8}$ in. back of the face of the channels. The end sills are braced at the center by 5-in., 6.5-lb., channels extending back to

tempt has been made to provide dead-air space between the successive layers of insulation and greater care has been taken in its application.

The cross sections show that below the $1\frac{3}{4}$ -in. flooring there is a 1-in. air space with 1-in. by 1-in. floor strips. A layer of felt paper is applied on top of two thicknesses of 1-in. corkboard. Before the felt paper is applied the top



Steel Underframe of the Baltimore & Ohio Refrigerator Cars

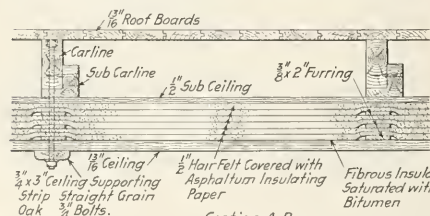
the ends of the body bolsters. The side sills are 6-in., 15.6-lb. Z-bars.

The side posts and braces are 5-in. by 2-in. Oregon fir, being set into malleable iron pockets doweled into the side and end framing. A tie rod is located at each post, extending through the side plate and side sill. The carlines are white oak, $1\frac{3}{4}$ in. thick. The ridge pole is secured to alternate carlines by $\frac{1}{4}$ -in. pressed knees bolted to both the carlines and the ridge pole. The flooring, lining, sheath-

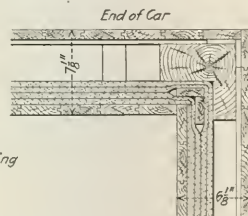
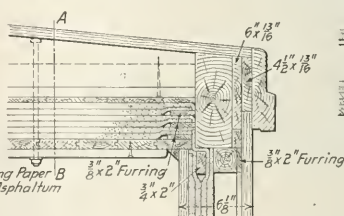
surface of the corkboard is coated with hot odorless asphaltum to tightly seal all joints. Beneath the two 1-in. thicknesses of corkboard there is a $13/16$ -in. sub-floor.

The $1\frac{3}{4}$ -in. flooring is supported on 3-in. by 3-in. nailing strips which are bolted directly to the sub-floor and the crossbearers of the underframe. The felt paper extends in one piece from side to side of the car, the ends extending up between the corkboard insulation on the sides.

The lower part of the siding is insulated with four layers



Section A-B.



Method of Applying the Insulation to the Baltimore & Ohio Refrigerator Cars

ing and ceiling are Oregon fir. The flooring is $1\frac{3}{4}$ in. thick, and the lining, sheathing and the ceiling are $13/16$ in. thick. The roofing boards are of the same material and are covered with the Murphy XLA outside metal roof. The end plates are 3 in. by 9 in. and the side plates are 3 in. by 8 in.

INSULATION

The method of insulating these cars, as stated above, is novel in contrast to the general practice followed. No at-

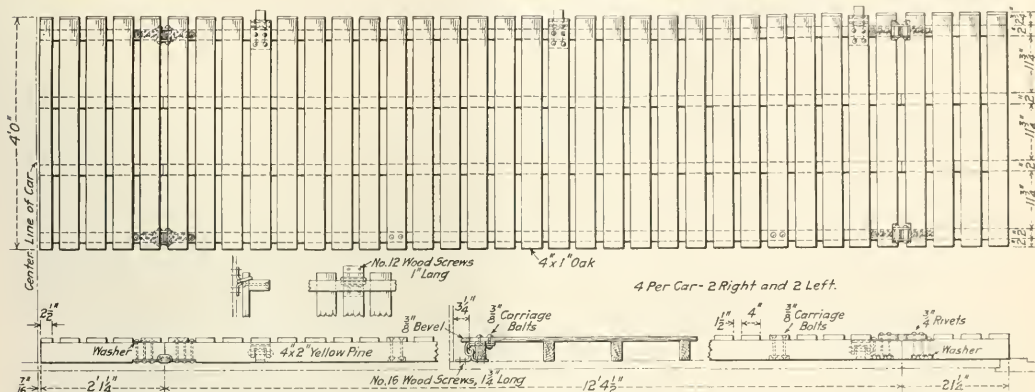
tempt has been made to provide dead-air space between the successive layers of insulation and greater care has been taken in its application. The cross sections show that below the $1\frac{3}{4}$ -in. flooring there is a 1-in. air space with 1-in. by 1-in. floor strips. A layer of felt paper is applied on top of two thicknesses of 1-in. corkboard. Before the felt paper is applied the top

the illustrations. The insulation passes around the corners of the car in continuous pieces to better provide a tight insulated joint. At the top the outside layer of insulation is lapped up into the ceiling insulation around the side plate.

The insulation in the ceiling is heavier than that on the

ICE BOXES

The ice boxes are of particular interest, being so constructed that a 2-in. air space completely surrounds the ice. The ice is contained in a heavy wire netting which exposes it to the air circulating through the car. The ice boxes are provided with a Bohn insulated collapsible bulkhead, which

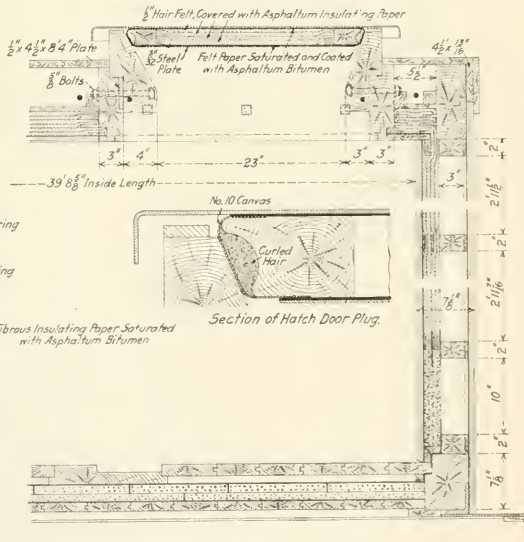
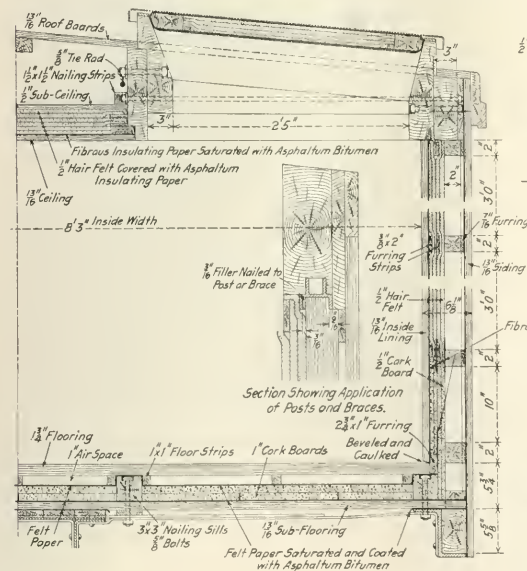


Details of the Hinged Floor Rack Used in the Baltimore & Ohio Refrigerator Cars

sides, as it has been found that the absorption of heat is greater at top of the car than on the sides. Six layers of $\frac{1}{2}$ -in. hairfelt are used here. These are placed directly on top of the 13/16-in. ceiling without any air spaces between them. On top of the insulation is placed a $\frac{1}{2}$ -in. subceiling which is nailed to the carlines. The weight of the ceiling

is 7 ft. $4\frac{1}{4}$ in. high, having an opening at the top and bottom for the circulation of air through the ice box. The insulated portion of the bulkhead is 5 ft. in height and this consists of a 13/16-in. lining, a 1-in. layer of corkboard and a $\frac{1}{2}$ -in. lining.

The purpose of insulating the bulkhead is to insure that



Sections Showing the Ice Hatch Insulation

with the insulation is too great for it to be substantially held by nails, therefore, $\frac{3}{4}$ -in. by 3-in. ceiling support strips are placed at every third carline and are bolted to the carlines by $\frac{3}{8}$ -in. bolts countersunk into the carlines.

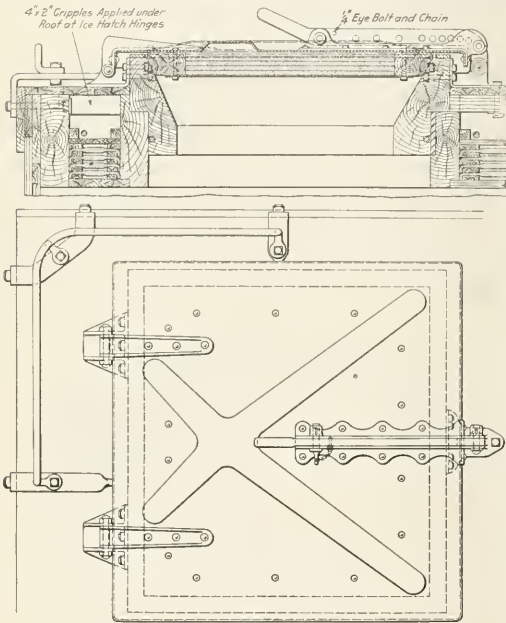
the ice bunker will not cool the perishable freight piled up against it to a lower degree of temperature than obtains in other parts of the car. This feature is an exceptionally important one, as bananas and other fruit, as well as eggs,

have been known to freeze when piled up against the bulkhead of ice bunkers that were not insulated. The insulated bulkhead also effects a more positive circulation through the car.

The wire netting which holds the ice is cut away at the top to allow swinging the collapsible bulkhead into place at the top of the car. Without this bulkhead the netting would ordinarily extend up to the top of the ice box.

To further assist in the positive circulation of the air, a floor rack made up of 1-in. by 4-in. boards, spaced $1\frac{1}{2}$ in. apart, is hinged to the sides of the car and when in the lowered position it is 4 in. above the floor of the car. This allows the cold air to work up through the load equally throughout all parts of the car and better refrigerates the material carried.

Considerable care has been taken to properly insulate the walls surrounding the ice box. The illustration shows how thoroughly this has been done. The runway for the collapsible bulkhead at the center of the car is insulated by six



The Ice Hatch Door

layers of insulation which extend around it. The spaces between this runway and the hatchway, and between the hatchway and the end of the car are as thoroughly protected.

The ice hatch and door are particularly well constructed. A $\frac{1}{2}$ -in. plate, $4\frac{1}{2}$ in. by 8 ft. 4 in., extends across the car in the hatch frame at the inner side to give it strength. In addition to this a bar $\frac{3}{8}$ in. thick by $1\frac{3}{8}$ in. wide extends around the top of the hatch frame for reinforcement. The hatch door is made with a $3/32$ -in. steel plate on the underside and a $\frac{1}{8}$ -in. pressed steel plate on top; these are bolted to the door frame by $\frac{3}{8}$ -in. carriage bolts. The upper plate is ribbed to give it additional strength and is flanged downward on all four edges to protect the joints from rain. Between the steel plates four layers of $\frac{1}{2}$ -in. hairfelt with felt paper above and below are applied for insulation. The lock bar is so designed that the hatch door must be tightly closed before the door can be locked. A series of holes are

provided in the lock bar to mesh with a hole in a bracket attached to the top coverplate of the door, to permit holding the hatch door open at desired heights when the car is used in ventilator service.

These cars are equipped with the Westinghouse type K brakes. The trucks used were taken from dismantled steel hopper cars and have 5-in. by 9-in. journals. The capacity of the trucks is 80,000 lb. The ice bunkers have a capacity of 15,000 lb. of ice.

"SHIPPING DAYS" ON THE B., R. & P.

The Buffalo, Rochester & Pittsburgh was probably the first road to inaugurate "shipping days" on which l.c.l. freight would be received for various destinations, placing this plan in effect on the Pittsburgh district and on lines as far north as Punxsutawney and Du Bois, Pa., on July 6. The plan was later extended to cover the entire system on September 10. It differs from the methods in effect on some of the other lines in that the road has been successful in getting the shippers to refrain from offering their freight except on the days on which the cars are forwarded and in this way avoiding holding cars under partial load until the day for their departure.

This co-operation on the part of the shippers was the result of the care with which the detailed sailing schedules were prepared. Before definite "shipping days" were announced, the assistant to the general manager went directly to the wholesale and retail merchants shipping over the line, explaining the proposed plan to them in detail and asking them regarding their actual requirements. In some instances merchants were located from five to seven miles from the railroad, but they, as well as those located immediately on the line, were visited. Conferences in some communities were completed in an hour, while others required several days.

Some merchants stated that it was not necessary for them to receive merchandise more than once a week, but that they preferred to get it on Friday as they desired to have the goods on their shelves for Saturday, and they did not have time that day to haul them from the station to their stores. Others, and they were in the majority, thought that shipments twice a week would take care of their requirements in a reasonable manner.

After visiting all of the shippers along the line, it was found that it was possible to reduce the local train service to one-half and at the same time provide the schedules which were desired. This made it possible to transfer 8 to 10 locomotives, cabooses and crews to through service and resulted in a number of important economies in addition to the immediate savings in wages and wear and tear on equipment.

This plan has also enabled the loading of cars to be increased materially. In August of this year over 3,770 tons more merchandise were handled on the road than during the same month of the year previous, while 2,530 less cars were required to haul it than would have been necessary with the average loading secured in August, 1916. At East Salamanca, where 2,893 tons more freight were loaded in 624 less cars with an increase in the average load of 6,925 lb. in through cars and 725 lb. for peddler cars, the average load in through cars this year being 34,275 lb. and in the peddler cars 13,450 lb. At Punxsutawney the average load for through cars was raised from 6,695 lb. to 15,724 lb., and in the peddler cars from 5,867 lb. to 11,622 lb. with a saving of 528 cars. Similar improvement was made at other stations along the line. It is stated that this road now leads the country in intensive loading, with a decrease of 42 per cent in the number of cars and an increase in tonnage of 91.7 per cent. We are indebted for this information to J. W. James, assistant to the general manager, who has been in charge of this work.

The Brown System of Discipline—Prize Article

Intimate Studies Reported by an Employee of Fifteen
Years' Experience on Both Large and Small Roads

By Sidney J. Keeler

Chief Clerk to Superintendent, Peoria & Pekin Union Railway, Peoria, Illinois.*

IN my varied experience on the road and in the yard, and as chief clerk to the superintendent, I have served on roads where both systems of discipline obtained, and on one road where the practice of assessing actual suspensions was changed and the Brown system substituted while I was there; and I unhesitatingly say the Brown system has proved far superior to that of causing employees to serve time.

First, and above all, it promotes a spirit of loyalty. It is a system which can be applied at any time, and it applies to the little things as well as the larger ones. The enforcement of actual suspension cripples the railroad. At times it is utterly impossible to dispense with the services of an employee for any length of time without detriment to the service. This is especially so under the recent stringent laws, limiting the hours of service, length of trains, etc., at a time when the supply of experienced men is necessarily limited. Quite often the suspension of one man would necessitate tying up an entire crew, or at best would handicap a district or yard. In such a situation the officer must either overlook a serious infraction of the rules and permit it to pass unnoticed, or must limit the suspension to a minimum not in keeping with the offense.

That the employees, as well as the officers, understand this is illustrated by the reply of a switchman on one of our larger railroads. Upon meeting him recently I inquired what system of discipline they were using now on the road where he was working. The answer was: "They haven't any system. They lay a man off for anything, when they have lots of men; but now they are short of men and a fellow can do anything, and hear nothing of it." The railroad referred to was among the pioneers in the use of the Brown system; but under new management it had reverted to the actual suspension system. It is noteworthy that that same road has had several serious collisions of late, to passenger as well as freight trains; cars left standing foul of main tracks, misplaced switches, short flagging, and many other evidences of carelessness and neglect. These mishaps do not occur where everything of the kind is properly dealt with when it comes to the attention of the officer. Without doubt the men in charge felt that such cases of seeming slight importance were not of sufficient consequence to cause a man to lose a day's time, or possibly a round trip, and at the same time cripple the service, at a time when the guilty ones could not be spared.

I daresay there is not one superintendent or trainmaster who has worked under the actual suspension system who cannot recall numerous cases in which employees should have been suspended for infractions of the rules, but which were permitted to pass unnoticed because to have suspended the man would have compelled the company to replace him with one not nearly so good. By application of the Brown system such cases could have been properly dealt with at the time they occurred.

IMPORTANCE OF UNINTERRUPTED TEAM WORK

The value of the record system of discipline is often noticed where it makes it possible to keep a crew intact. It

weakens a crew to have to replace any member by a younger or extra man, be it an engine crew, a train crew, or a yard crew. Regardless of the question of experience, the extra man is not entirely familiar with the methods of the different crews and they are not acquainted with his work; and until such time as they do become thoroughly organized, the crew is weakened, and the company suffers in proportion. A check of accidents occurring on one railroad during the past four years shows that 78 per cent of those which were avoidable were chargeable to men who had been in the service less than six months, and were filling extra positions. I believe this to be a fair average, and one which will be found to exist on the majority of railroads, this especially as the road mentioned always hired experienced men where it was practicable to do so.

Not only are the services of the employee lost to the company during the period of actual suspension, but I have known old and faithful employees to become so dissatisfied through continually serving time for minor infractions of the rules where a good intention went wrong, or where a conductor, foreman or responsible head has been compelled to serve time through the carelessness or neglect of some subordinate—in many cases an extra man with whose capabilities he was not entirely familiar—that they sought employment elsewhere, under the Brown system, where they could be assured of uninterrupted service. In other cases, I have known where men found it necessary to seek employment in the service of other roads while "serving time," in order to keep their families provided with the necessities of life. These became attached to their new positions and valuable men were lost to the company.

DISCIPLINE AND DOMESTIC RELATIONS

Consider, also, the man's family. Most men of the caliber we desire to have for our employees are paying for a home, or have planned their financial affairs ahead, so that the loss of time by suspension interferes with their plans, and results in dissatisfaction on that account. Furthermore, the railroad man of to-day realizes that he must take a vacation or rest periodically in order to retain his health, and he figures his financial affairs accordingly; so that he can be absent at the time when business is slack and he can be spared from the service. He is able to do this under the Brown system, for he knows that so long as he remains in the service of the company he is privileged to work steadily; whereas, under the actual suspension system, if he is compelled to serve time when he does not need the rest, or when for other reasons he cannot leave his place of residence; when slack business rolls around and he could be spared, and he would like to take a rest, he cannot afford to do so, because he must work to make up for the time he has lost. The company suffers by the failure of a wornout machine, not physically fit to give one hundred per cent service.

REASONABLENESS OF THE BROWN SYSTEM

The brotherhoods have now reached the point where they are sufficiently strong to protect their members and insist upon their receiving the proper consideration at the hands of officers. The general run of railroad officers are capable and fair, but I have known cases where they were so unreasonable that the employees were compelled to serve actual

*Mr. Keeler has served on the Missouri Pacific, the Rock Island, the Union Pacific and other roads, mostly in clerical positions; but he has had some little experience in train work. His father has been in the train service all of his life and has worked under both Brown's discipline and the old fashioned kind.—EDITOR.

suspension where they were not at fault; and through their organizations, the employing officers have been compelled to reinstate the men and reimburse them for the time lost. How much easier it would have been under the Brown system; the officer could have reversed his decision when new facts developed, and he found the discipline was unjust, and the cancellation of the demerits would have closed the case.

It is contended by some that the only way to reach a man is through his pocketbook. But the number of these is decreasing and the time when that was the accepted rule in the railroad service is history; the successful officer to-day is the one who deals kindly yet firmly with his men, one who will reason with them, and is broad enough to see the employee's side as well as the company's. Employees will go much further to serve the interests of the company out of regard for the individual officer than they will out of fear of discipline.

Others say that an employee does not mind receiving demerits. My observation is that this statement is not borne out by the facts. There is no man so devoid of manhood that there is not some spark of good in him which can be brought to the surface by proper consideration; while many good men have had their future ruined through misuse of the power intrusted to a railroad officer. The men do take an interest in their personal record under the Brown system; anyone of contrary opinion has only to assess demerits wrongfully and see how quickly the employee will call at the office to present his side of the case and get justice. Moreover, the men make a practice of calling at the office at frequent intervals to look over their account and see how they stand with the company; and they have benefited by their wrongs and worked just as hard to atone for their wrongs, where the discipline was by record, as though they were compelled to serve the time. This is not merely a supposition on my part; it is information gained from conversation with railway officers who have risen from the ranks. They will tell you that while serving in the ranks they have tried as hard to retain a clear record under the Brown system as they did to avoid suspension. The general run of employees take as much pride in an untarnished record as any average intelligent man would in a duty well performed.

UNIFORM ADMINISTRATION DESTRAIBLE

At the present time there appears to be no standard measure of discipline on the railroads of this country. Some consider one demerit equal to thirty days' suspension, with a limit of ten demerits resulting in dismissal. I believe the better plan is where demerits are placed in multiples of five, with a limit of ninety or one hundred resulting in dismissal; not more than thirty demerits being assessed for any offense, and a clear record for stated periods canceling a specified number of demerits. Under this arrangement, any man dismissed from the service and later reinstated would return with sixty demerits still standing against his record. The accumulation of ninety (or one hundred) demerits should not be limited to any definite space of time. I have never known a really desirable employee to be dropped from the service through accumulation of demerits so long as demerits are canceled by clear records for stated periods. The use of the reprimand is an important element; to be used where the offense is not of sufficient consequence to require demerits, but which at the same time should not be permitted to pass unnoticed.

Some companies use the actual suspension system in conjunction with the record system. In my opinion it is preferable to use one system; else the discipline cannot be uniform.

So universal has the practice become of considering a demerit equal to a day's pay that the term "days record suspension" is considered preferable to "demerits."

Many of the larger roads compile periodical statements showing the actual amount of money saved employees through

use of the Brown system, which figures are taken from the payroll records showing the pay the employee received during the time he would have been serving actual suspension were the other system in use. It is needless to say that the saving represents a considerable amount of money to the employees and their families. But I dare say it would represent even a greater amount to the company were it possible to make a comparison with the results which would have been attained under the system of causing employees to serve the time. Unfortunately such a comparison is not possible; if it were possible to place a monetary value on loyalty and efficiency, and on the benefits of an uninterrupted organization, the actual suspension system would be a thing of the past on every railroad in America.

AMENITIES MUST NOT BE FORGOTTEN

Some railroads do not make a practice of recognizing meritorious acts, while others recognize them by letter, but make no favorable entry on the man's record. If we are going to keep a record of an employee, it is only just that we record and give him credit for his good acts as well as the bad. It is contended that the men are simply obeying the rules when they stop to extinguish a fire, remove a dangerous object from the track, make light repairs to a car of important freight which will permit it to go forward without delay, notice a dangerous condition of a car in a train of another crew or company, or perform many acts of seeming little importance; but I know that the men place greater than a monetary value on letters of recognition of a meritorious act. It should be made incumbent on employees to report any creditable act of themselves or their fellow-men the same as they are required to report accidents or infractions of the rules. It is a very easy matter for an employee to overlook material left carelessly beside tracks jeopardizing the lives of employees, or a fire burning in or near company property which might cause much greater damage if not promptly controlled; but by letting the men know that such acts are noted and appreciated there will be stimulated an alert disposition to watch out and to promptly remedy or report dangerous conditions. The results attained are far in excess of the effort required to write a letter thanking the man for the thoughtfulness and interest shown.

Regular monthly or semi-monthly bulletins, omitting names, but showing the credits and the record suspensions, are an important feature. Bulletins should go sufficiently into detail to show employees wherein the guilty ones err, or what rules were violated; and in the case of credits should show wherein some thoughtful act saved the possibility of injury to others, or damage to property. On the road I mentioned where the actual suspension system was replaced by the Brown system, it was a noticeable fact that the first educational bulletin took several sheets to record the demerits, with but few cases worthy of creditable mention; but there was a noticeable improvement from the first, and in a short time one sheet would cover the demerits, with the credits far in excess. There was a distinct change in the men; they took pride in their records and they worked together and perfected an organization which reached the highest point of efficiency. I can think of no stronger argument in favor of the Brown system than the change which was effected on that road; it was a revival of intelligent interest and loyalty that would convince the most skeptical.

Many of our railroads have advanced in their power, their roadbed, and their rolling stock, but have stood still in their organization and discipline. The character of the employees has advanced; the men of to-day cannot be compared to those of twenty or thirty years ago, who entered the railroad service because they had the strength of body, while they lacked the education to enable them to hold higher positions. There is no class of employees that has improved so rapidly as the railroad man. The railroad employee of

today must be a man of intellect. Our system of discipline must keep up with the times. I know of no class or occupation which cannot be properly reached through the use of the Brown system; it will cover every department of the service as well as the trains, yards and stations, and I believe it should be universal.

It seems to me that any railroad officer who has not become fully convinced of the wisdom of abolishing suspensions needs only to work under both systems and see both sides of the question. He would then appreciate the value of an organization composed of loyal and faithful employees who are ready at all times to go out and "do their bit" for the railroad company because they know their employers appreciate their desire to do right at all times. He would know how the men value a system which does not take the bread out of the mouths of their wives and children because of some slight fault of omission or commission. As the merits of the system become better known and the lessons of experience multiply, it must be that the wisdom of abolishing suspensions will come to be that acknowledged by railroad officers everywhere.

CONVENTION OF RAILWAY TELEGRAPH SUPERINTENDENTS

A special meeting of the Association of Railway Telegraph Superintendents was held in the Hotel La Salle, Chicago, on Thursday, November 22. The 1917 annual convention, which was to have been held in Washington, D. C., September 18 to 21, inclusive, was postponed on account of the war. The meeting was called to order at 9:30 a. m. by M. H. Clapp, superintendent of telegraph of the Northern Pacific, St. Paul, Minn., president of the association, with 59 members and 19 guests in attendance.

In a short opening address Mr. Clapp stated that the discussions at this special meeting would be on war topics and added that the annual convention would probably be held next year but the place of meeting would be decided later. The first speaker was Colonel Leonard D. Wildman, chief signal officer, central district, signal corps, U. S. army, who described the growth of that branch of the service in the present war and told of the methods used for training men to be telegraph and radio operators in the several schools recently started by the government in different parts of the country. In view of the urgent need for men, he expressed his approval of the recent suggestions that the roads employ women operators and also use the telephone wherever possible for the transmission of commercial and railway messages, thereby releasing experienced telegraph operators for government service.

A service flag with seven stars representing seven absent members hung over the speakers' platform. The following eight members are in government service; one having entered since the flag was ordered: C. D. Beard (P. & L. E.), F. E. Camp (C. P. R.), Claude Mitchell (G. C. L.), F. T. Caldwell (G. T. P.), J. H. McGlogan (G. N.), D. O. Van Der Vort (M. C.), I. D. Hoagh (E. P. & S. W.), P. H. Chapman (N. E. S. Co.). A motion was unanimously carried that the names of these eight members, and all others that may join the colors, be placed on the Association's Roll of Honor and all dues be annulled for the duration of the war.

The first report was read by J. F. Caskey (L. V.), chairman of the Membership Committee, who reported that there were 131 active, 77 associate and 45 honorary members, a total of 253.

Though the report of the subcommittee of Committee No. 1 on Wire Crossings was not presented in full by G. A. Cellar (P. L. W.), chairman, he outlined its plan for future investigation which is considered necessary before presenting the report for final action. The acting chairman of a subcommittee of Committee No. 1 on Transposition, G. A.

Dornberg (P. L. W.) recommended the adoption of the Western Union specifications. No action was taken.

R. F. Finley (N. Y. C.), chairman of special Committee No. 2 on Construction and Maintenance of Inside Plant, discussed the gathering of specifications and additional data which the committee had been working on but stated that his report was not complete. E. A. Chenery (Mo. Pac.), chairman of special committee No. 3, Wire Chief's Equipment and Routine, stated that as the report to be made by his committee depended directly in some cases upon that of Committee No. 2, it was necessary for them to work together and therefore report together.

Committee No. 5 on Protection Against Lightning and High Tension (Circuits, of which J. F. Caskey (L. V.) is chairman, reported having held five meetings since the last convention. Mr. Caskey discussed briefly some of the recommendations the committee would submit at the next meeting, among which was the advisability of using for the present an air gap and a vacuum arrester in multiple.

The report of Committee No. 6, on Telephone and Telegraph Development, was made by E. C. Keenan (N. Y. C.), chairman. Mr. Keenan said that only six replies had been received in answer to a circular letter, explaining the purpose and duties of this committee and asking for suggestions and information concerning new devices and equipment, which he had sent out to all members of the Association. Four new devices were recommended.

SCHOOLS FOR TELEGRAPHY

Committee No. 7, on Railroad Message Traffic, F. T. Wilbur (I. C.) chairman, had been assigned the special duty of considering the shortage of, and plans for, schools to teach telegraph operators. As this subject is of vital importance to practically all the railroads in the country, a general discussion was entered into. Mr. Keenan (N. Y. C.) stated that the New York Central has operated a school at Albany, N. Y., for a number of years and has recently opened telegraph schools at Utica, N. Y., and Rochester, for the instruction of students in telegraphy and in the operation of block signals. He has more applicants than he is able to enroll in either of these schools. An entrance fee of \$2 is charged and thereafter a monthly tuition fee of \$1. The money is refunded to the students who complete the course and who enter the service of the railroad company. The majority of students have been girls and on completing the course he finds them willing to go to way stations. Mr. Finley (N. Y. C.) stated that there were 12 women operators on duty on the Lines West and that he had received no complaints relative to their employment from the Order of Railroad Telegraphers. A point was then brought up by some of the members as to laws regarding the working of women more than a certain number of hours. One member emphasized the desirability of training clerks to be operators as they were familiar with the railroad operating routine and could grasp the work more quickly than a person who had had no experience along those lines.

G. M. Dodge of the Dodge Institute gave a talk outlining the purposes and course of study at his school. This was followed by a general discussion in which H. D. Teed (St. L.-S. F.) stated that employees of the Frisco in the various offices who expressed a willingness to learn telegraphy were excused from their regular duties for 1½ hours each day to receive instruction and were expected in return to devote the same length of time at the school in the evening. Practically all of the students who are receiving instruction in this way, about 100, are applying themselves very earnestly. After completing this part of the course, the prospective operators are given experience in the handling of tickets which proves of much assistance to them after being assigned to an office, and it is also found that an agent is usually glad to have an operator in the office

who has had this kind of experience. The personal interests of the girl operator, who has been assigned to an office, such as the handling of her baggage, assisting her in locating comfortable quarters, etc., are looked after by some one assigned to this work by the telegraph superintendent and who remains with her in the new office for two or three days, when possible, to see that conditions are made agreeable.

Mr. Wilbur offered suggestions relative to the conducting of schools, offering a bonus to employees who will teach a student telegraphy who afterwards accepts employment on the road; and soliciting the co-operation of the Order of Railway Telegraphers.

Among the members present, 8 reported that they are operating schools, 12 have no school and 4 are contemplating the opening of schools. The members operating schools reported as follows: N. E. Smith (N. Y., N. H. & H.), 100 students in two schools; E. C. Keenan (N. Y. C.), 194 students in seven schools; F. T. Wilbur, (I. C.), ten students in one school; Stanley Rhoads (C., C., C. & St. L.), 15 students in one school; W. H. Hall (M. K. & T.), 50 students; J. J. Rounds (D. & H.), 42 students in one school; H. D. Teed (St. L.-S. F.), 100 students.

A general summary of the discussion on schools showed that with a few exceptions no difficulty was being experienced in enrolling in the larger cities all the student operators that the school could train but the same success had not been met in the smaller towns, especially in the west.

CONSERVING TELEGRAPH AND TELEPHONE FACILITIES

A special committee consisting of Messrs. Cellar, Chenery and Keenan had been appointed by the president to consider and report on the conservation of telegraphing and telephoning in connection with both commercial and railroad wires. The committee reported that it had communicated with the entire membership of the Association and found that the service was being threatened with demoralization due to the enlistment of telegraphers in the army and navy and added that, with the calling of another draft quota and with the increased requirements of the railroads on account of the extraordinary government and commercial transportation, the condition would be made more acute.

It is estimated that about 50 per cent of the burden of tracing freight by telegraph, which is now imposed upon the railroads, is unnecessary and further, this use of the wires is rapidly increasing. Also, a large number of such messages are unnecessary and by concerted action could be abolished or largely curtailed. Also a large number of the messages contain superfluous words. It was further stated that a great deal of the information now being communicated in telegraph messages could be sent either by letter or by train-gram. The railway companies' telephone facilities are being greatly abused on account of conversations that are unnecessary or unnecessarily long, or of a social nature. The committee recommended the following in order to save in the use of telegraph and telephone facilities and to expedite necessary telegraphic and telephonic traffic:

(a) That concerted action be taken by the different railroads to greatly curtail, if not altogether abolish, telegraphic tracing of freight at the request of the consignor or consignee. In the opinion of the committee this concerted action can only be secured through the American Railway Association. That like action be taken in connection with any other system of telegraphic reports that are in use at present on the different railroads and are not necessary for efficient operation.

(b) That steps should be taken to eliminate all superfluous words from messages.

(c) That train or United States mail shall be used in forwarding all communications where it is not absolutely necessary to communicate the information by wire. The

carrying out of this recommendation contemplates special surveillance of communications to be forwarded late in the afternoons, or on Saturday afternoons and Sundays, or holidays, the idea being that no communication shall be sent by telegraph that can be forwarded by mail and still serve its purpose. It is expected that the train mail service can be made more reliable and expeditious by the use of special pouches for traingrams, delivered direct to the train baggageman just before the train is due to depart, the train baggageman to deliver the pouches directly to a messenger who will meet the train at the destination point.

(d) That adequate code and symbol systems and other methods for cutting down the number of words actually used in messages be generally adopted by the different railroads.

(e) That surveillance of the use of telephone facilities, both railroad and commercial, be instituted with the view of doing away with the present abuse of these important facilities.

(f) That an adequate and effective system of censoring telegraphic and telephonic communications be adopted by all the railroads. In order to carry out this recommendation, the following plan is recommended:

1. The issuing of special instructions over the signature of the highest officer of each railroad, appointing the superintendent of telegraph, or any other designated officer as official censor of all telegraphic messages of the officers and employees of the railroad.

2. The formulating and issuing by the official censor of the instructions necessary to put into effect and carry out the plans and recommendations contained in the preceding paragraph.

3. In view of the fact that for many years it has been the practice to scrutinize the telegraph office files and call attention to the unnecessary and improperly worded telegrams after they have been transmitted, and that this practice has been demonstrated to be not entirely adequate in the present emergency, it is recognized that it be made a fundamental of the censorship systems which may be adopted by individual railroads that telegrams must be censored *before they are sent* by a regularly appointed and responsible person in each department or departmental office. This person should receive detailed instructions from the official censor and be held for all violations occurring under his jurisdiction, which should be clearly defined.

(g) That the construction of additional telephone circuits for dispatching trains and for local message work should not be stopped or deferred on account of the war, but, on the contrary, should be prosecuted with greater vigor, to the end that as the shortage of telegraphers becomes more acute, they can be replaced without the delay incident to the long training required to master the art of telegraphy.

To this report was added a resolution recommending its adoption and the sending of copies at once to each member of the association and to the president or general manager of each railroad in the United States and Canada, and further, its submission later to the American Railway Association.

The president then introduced J. E. Dempsey, who spoke on the adoption of a code by railroads to be used for all telegraphic communications. The code which Mr. Dempsey compiled has been adopted by the Committee on National Defense and is used in handling government messages now. Mr. Dempsey is preparing a train sheet, which he will submit to the Committee on National Defense, whereby the movement of all troop and supply trains can be followed and recorded. Their routing and progress can be handled over the wire in one word.

In the absence of E. T. Griffith (Erie), chairman of Committee No. 8 on Commercial Telegraph Service, the report was read by F. L. Van Akin, Jr. (N. Y. C.).

The Employment of Women in Railroad Shops

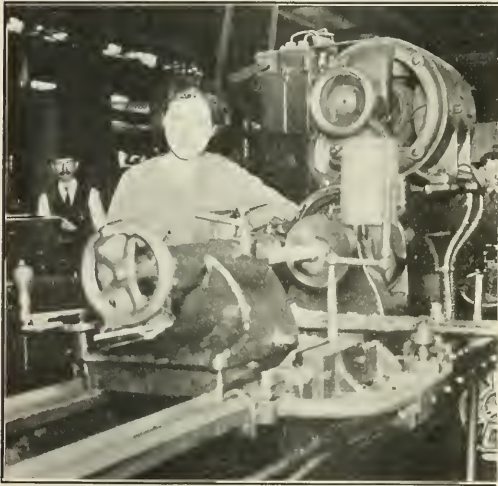
Roads Relieve Serious Labor Shortage by Hiring Women; Notes on the Results at Some of the Shops

THE depletion of the forces in the railroad shops of this country, which during the past year has been very serious, seems now to have reached a point where any further reduction will inevitably result in a loss of efficiency in that department of the railroad organization. It was thought by many that after the men who were chosen for the national army were called there would be few changes in the force, but this has not been the case. The railway regiments now being formed for the purpose of rehabilitating the Trans-Siberian railroad will of course take their quota from

plane that would draw men from other industries, many would be taken from shops whose work is essential at this time, and the nation's productivity would not be increased by the shifting of workers. Labor-saving machinery might help the situation in some cases, but it is almost impossible to secure tools at the present time owing to the unprecedented demand. The logical way out of the difficulty seems to be to employ women in greater numbers for doing work in the shops.

Many roads have introduced women workers in the mechanical department, among them being the Baltimore & Ohio, the Erie, the New York Central lines, the Minneapolis, St. Paul & Sault Ste. Marie, the Chicago, Burlington & Quincy, the Northern Pacific, the Union Pacific, the Oregon Short Line and the Chicago, Milwaukee & St. Paul. On most of these roads the employment of women has passed the experimental stage and sufficient data are now available to make it possible to judge the value of women in shop work. Some observations made in shops where women have been employed for some time will show the progress that has been made in this direction.

The difficulties encountered in introducing women work-



An Expert Machine Operator Who Was Formerly a School-teacher

the railroad shops, and the increasing requirements of other branches of the government service will result in the withdrawal of considerable numbers. Of greater consequence, however, is the readjustment of labor, which will proceed slowly for a considerable period. Many of the war industries have lost men through the selective draft, and a part of the positions thus made vacant will surely be filled from the ranks of the railroad shopmen, some of whom place the higher wages to be secured elsewhere above the permanence of employment which the railroads provide.

It is quite unnecessary to state that no curtailing of the output of the railroad shops can be permitted at this time. In spite of all that the railroads can do cars and locomotives will deteriorate faster than they can be repaired. Daniel Willard, in his address, "How Railway Efficiency Helps Win the War,"* made it clear that the efficiency of the railroads will play an important part in winning the struggle. To keep the equipment of the railroads of this country in condition has now become a patriotic duty.

How is the labor situation to be met? In spite of the numerous wage increases which the roads have put into effect since the beginning of the war, it is impossible for them to compete in the labor market with plants manufacturing war supplies. Even if it were possible to put wages on a



Women Employees Grinding Tools, Havelock Shops, C. B. & Q.

ers in the shops have not proved serious. Rooms in which women can change from street to shop clothes, rest rooms and toilet facilities are, however, essential. Where women are employed around shops, skirts are in most cases a hindrance and sometimes a source of danger. It is, as a rule, unnecessary to urge the adoption of more suitable attire, the women workers being quite willing to don loose overalls. Women who work around power-driven machines should wear caps to preclude the possibility of injury by loose strands of hair catching in shafting or belting. In many states the hours of labor of women workers are limited by statute and special

*See *Railway Age Gazette*, August 17, 1917, page 274.

reports are sometimes required, but these are of such a character as to require but little clerical work.

On many railroads women have heretofore been excluded from the shops to such an extent that it is an easy matter to find positions for which women are quite as well fitted, now filled by men. For example, there are a great many male clerks employed in places where women after a short period of training could handle the work with little difficulty. At the Havelock, Neb., shops of the Chicago, Burlington & Quincy a woman is employed in distributing blueprints with entire success, although the work requires some knowledge of locomotive parts in addition to an understanding of the filing system. At Havelock women are also doing work which requires considerable skill, such as operating lathes, milling machines, gear cutters and shapers. Their work has been found highly satisfactory, and though a trifle slower

rience, and she is now holding a responsible position in the office of the general superintendent of motive power.

At the Pocatello, Idaho, shops of the Oregon Short Line women are now handling a large part of the work in the machine shop and car department on which male help was previously used. Women are probably employed to a greater



A Woman Operator Milling the Ports in a Valve Chamber Bushing, Pocatello Shops, Oregon Short Line

than men, they seldom make mistakes and do very accurate work.

An instance which shows the natural adaptability for machine work that some women display will serve to indicate the possibilities for women in railroad shop work. A young woman who, after graduating from a university, had been teaching the sciences in a Nebraska high-school, secured a position in the Havelock shops of the C., B. & Q., thinking the experience she could gain during the summer would be of value to her in teaching. She became so proficient that she was assigned to lathe work in the tool room and the work proved so fascinating that she resigned from her teaching position. Although the lady in question had intended to remain in the shops indefinitely, her stay there was limited to three months. At the end of that time a vacancy occurred in the general offices of the mechanical department, for which she was particularly qualified by reason of her shop experience,



Colored Women Working on Bolt Cutters at Pocatello Prove as Efficient as Men

extent in this shop than at any other place in this country. The effort to relieve the labor situation in the shops in this way has been so successful that if it were possible to get more women for shop work, it is probable that they would be employed in even greater numbers. No special training was provided for the women workers except such as is usually given to apprentices. The instructor who directed the work



Women at the Pocatello Roundhouse, Oregon Short Line, Cleaning Locomotive Cabs

of the apprentices also instructed the women. All the women at Pocatello are under the supervision of men, but at Salt Lake on the same road, where a great many women are employed as coach cleaners, a woman is in charge, who reports to the foreman of the coach department.

In the machine shop women are employed in the operation of engine lathes, boring mills, milling machines, planers, brass lathes, drill presses, cutting-off machines and nut tap-

ping machines. Most of the women are kept on specialized work. Those who show special adaptability, however, are trained on machines of all kinds, and some are capable of running almost any machine in the shop. It is the opinion of those in charge that a considerable proportion of the women workers could readily be developed into skilled machine operators.

The reclaiming and repairing of cab cocks, globe valves, boiler checks and miscellaneous valves is now done largely by women. In the tin shop they are repairing lanterns, oil cans, etc., as well as doing general tinsmith work. A woman is employed to run the motor-driven transfer table. Staybolts are finished in the boiler shop by two women, who are doing as good work as the men who formerly ran the machines. All parts of locomotives are now painted by women.

In the coach shop women are doing the upholstering work, cleaning coaches and preparing them for painting. Two colored women work almost entirely at painting and varnishing coach sash. While men are still employed on engine wiping, the cabs and the cab windows are cleaned by colored women.

It has been found that the output of the women workers employed at Pocatello compares very favorably with the output of male help and with efficient supervision the quality of the work is equally good.

At other shops women are employed on various classes of work which have not been mentioned, acting as helpers for machinists, blacksmiths and car repairers, operating steam hammers, building grain doors, packing journal boxes, reclaiming waste, sorting scrap and cleaning yards and shops.

At least one road has employed women as tracers in the drafting room, which suggests a method for relieving to some extent the serious shortage of draftsmen. In general, the experience which the railroads have had with the employment of women in the shops seems to indicate that it offers in many cases the only satisfactory solution of the labor problem of the mechanical department.

WASHINGTON CORRESPONDENCE

WASHINGTON, D. C., November 27, 1917.

BROTHERHOOD CHIEFS CONFER WITH PRESIDENT

The situation created by the new demands of the brotherhoods of train service employees for higher wages was not appreciably clarified as the result of the conference between the executives of the four brotherhoods and President Wilson on November 22, at least in so far as the results of the conference have been made public in statements issued by the brotherhoods and by the White House. The President confirmed the brotherhoods' statement and said he had received the impression that they were willing "in case any critical situation or controversy should arise, to consider any proposed solution in a spirit of accommodation and a patriotic purpose," while the statement itself declared that they "would be more than willing to discuss and consider any solution of the difficulty which presented itself, doing so in the spirit of patriotic co-operation."

While these expressions contain no threat of an attempt to interrupt transportation service and offer an opportunity for the President to propose a plan of settlement, they contain no promise that the threat will not be used later, and there is a marked difference between the attitude expressed by the brotherhoods and that of the Railroads' War Board. Speaking for the railroads, Chairman Fairfax Harrison had placed the interests of the railroads "unreservedly in the hands of the President for protection, and for disposition as he may determine is necessary in the public interest."

The brotherhoods merely told the President they wanted more money and would consider any peaceable method that might be proposed for giving it to them, and, at least so far

as the statements indicate, they have not committed themselves to anything more definite.

The two-hour conference with the President was attended by W. G. Lee, president of the Brotherhood of Railroad Trainmen; Warren S. Stone, grand chief of the Brotherhood of Locomotive Engineers; A. B. Garrettson, president of the Order of Railway Conductors; W. S. Carter, president of the Brotherhood of Locomotive Firemen and Enginemen, and also by W. L. Chambers and Judge Martin A. Knapp of the Board of Mediation and Conciliation.

Afterward Judge Chambers told newspaper men that matters looked "favorable." The brotherhoods gave out a signed statement as follows:

"The men who comprise the railway brotherhoods are thorough Americans, therefore they believe in American standards of living, and in consequence of this realize that standards of pay that were established in 1912 and 1913 are inadequate to meet present-day prices for commodities, and for that reason are demanding an increase in present rates that will meet half at least of the increase in cost of those things which they are compelled to purchase.

"They want to co-operate in every way that is at all possible in the successful prosecution of the war, and they fully realize that the most serious thing that could occur during the conduct of war would be any interruption of railway transportation, and they, in common with the great body of the people, are determined to do everything within the bounds of reason to avoid such interruption.

"Being fully conversant with their attitude and desire in this matter, we are in a position to give the assurance that, if a situation should arise which would threaten the interruption of transportation, the men whom we represent would be more than willing to discuss and consider any solution of the difficulty which presented itself, doing so in the spirit of patriotic co-operation, and would undoubtedly co-operate with the Government to the utmost extent in arriving at a just, equitable, as well as patriotic conclusion."

This was followed by a statement from the President authorizing the representatives of the press to say, "that he had got from the interview exactly the impression conveyed by the statement of the heads of the brotherhoods, namely, that the men whom they represented were not inclined to contend for anything which they did not deem necessary to their own maintenance and the maintenance of their families, and that they would be willing in case any critical situation of controversy should arise to consider any proposed solution in a spirit of accommodation and of patriotic purpose."

The rather vague character of these utterances may possibly be ascribed to the fact that the brotherhoods have not yet completely formulated their demands and it is, therefore, somewhat uncertain how great a problem is involved as to the ability of the railroads to pay the higher wages.

The fact remains that the brotherhoods are insistent that the wages of their members shall be increased and that they do not intend to let go of the club they possess in their ability to call a strike, which would be disastrous at such a time. Apparently also they decline to recognize the effect of the Adamson law in increasing their wages for the purpose of persuading them not to strike last year.

Thus far only the conductors and trainmen have formulated their demands. These are now being submitted to a referendum vote of the membership. Demands from the engineers and firemen, if they have been decided upon, have not yet been announced.

The circumstances attending the passage of the Adamson "eight-hour" law were recalled, on the same day that the brotherhood leaders saw the President, by a brief filed in the Supreme Court by the government supporting a decision of a federal court in Arkansas that the Adamson act applied to all railroads, regardless of whether they had a wage dispute pending at the time the law was enacted. The Fort

Smith & Western Railway Company had appealed from the decision.

"Congress did not undertake to investigate the conditions surrounding different roads," said the Government's brief. "It merely faced the fact that the commerce of the country was about to be tied up and endeavored to adopt a general measure to give relief. If it had known, as it probably did not, that there were some roads whose men would not join in the strike, it doubtless would still have passed an act applying to all alike. But slight knowledge of human nature is necessary to make it apparent that if relief had been granted to some and withheld from others, the result would have been new dissatisfaction which would speedily have brought about another emergency of the same kind to be dealt with."

COMMISSION REDUCES ACCOUNTING REQUIREMENTS

As a measure of war time economy the Interstate Commerce Commission has issued an order providing that the observance of the requirements of paragraphs 2 and 3 of its order of June 15, 1915, prescribing the rules governing the separation of operating expenses between freight service and passenger service on large steam railways may be suspended until otherwise ordered. The railroads, through the accounting officers' association, recently proposed both to the Interstate Commerce Commission and to the state commissioners a curtailment of the accounting requirements during the war, in order to conserve clerical forces, and while the whole program has not yet been acted upon, the commission has reduced many of its usual requirements of this kind.

WILLARD RESIGNS FROM WAR BOARD

Daniel Willard, president of the Baltimore & Ohio, has resigned as ex-officio member of the Railroads' War Board because of his appointment as chairman of the War Industries Board of the Council of National Defense. As chairman of the Advisory Commission of the Council of National Defense and chairman of its committee on transportation and communication Mr. Willard called the meeting of railway executives held at Washington in April which resulted in the organization of the Railroads' War Board and the agreement to operate the railroads of the country as a national system under its direction.

STATE COMMISSIONS APPOINT WASHINGTON REPRESENTATIVE

Charles E. Elmquist, for several years a member of the Minnesota Railroad and Warehouse Commission, has been appointed solicitor for the valuation committee of the National Association of Railway & Utilities Commissioners, with office at Washington, D. C., succeeding Clyde B. Aitchison, who was recently appointed a member of the Interstate Commerce Commission. Mr. Elmquist has also been appointed representative at Washington of the Special War Committee of the association and has been in conference with the Interstate Commerce Commission and the Railroads' War Board to express the desire of the state commissioners to co-operate in the work of winning the war and to establish a co-operative working basis.

NEWLANDS COMMITTEE TO RESUME HEARINGS

The Congressional Joint Committee on Interstate Commerce, of which Senator Newlands is chairman, will resume hearings in connection with its general inquiry into questions of railway regulation and control, at Washington, on December 4. It is probable that the first testimony will be that of officers of the transcontinental lines regarding the transcontinental rate situation as a reply to some of the testimony presented by state commissioners and shippers of the intermountain territory at the recent hearings in San Francisco.

COAL PRODUCTION AND DISTRIBUTION

Production of bituminous coal during the week ended November 17 continued at a rate of 1,890,590 net tons per working day, an increase of 2 per cent over the previous week, according to the weekly report of the Geological Survey. If the present rate of production is continued, the report stated, November should prove the best month in the history of bituminous mining in the United States. The total production, including coal made into coke, is estimated at 11,343,538 net tons. Shipments of anthracite, as reported by the nine principal carriers, amounted to 42,199 cars; this is below the level maintained during October. For the country as a whole, the ratio of tonnage produced to the full time capacity for the week ended November 10 was 77.8 per cent as compared with 75.4 per cent during the previous week. The improvement was attributable to reduction in the losses due to labor shortage, strikes and mine disability. Losses due to car shortage increased from 14.5 per cent to 15.3 per cent.

October production of bituminous coal is estimated to have been 47,429,780 net tons, an increase over October, 1916, and the total production from January 1 to October 31 is estimated as 454,326,059 net tons. This is an increase of 40,833,075 tons over the production in the corresponding months of 1916, or 9.9 per cent.

Fuel Administrator Garfield has decided to request Director of Priority R. S. Lovett to cancel priority order No. 1, which gave preference to coal shipments bound to the Northwest by way of the Great Lakes. Under this order a vast coal supply has been built up in the Northwest in advance of the closing of lake navigation.

The Fuel Administrator's recommendation would provide that the lifting of the priority order would begin at the mines on November 30. Cars at the mines at that date could be loaded, and would be given priority until they arrive at their lake port destinations.

The cancellation of the lake priority order, it is stated, will allow the coal produced in the central coal fields to find its way to its natural markets, and will do much to relieve present conditions in the central and eastern parts of the country.

The Fuel Administration believes that the supply secured for the Northwest under the lake priority order will place that section on a parity with the rest of the country for the winter. If further coal is needed in the Northwest before spring, steps will be taken to insure all-rail shipments from nearby fields to complete the requirements. With the lifting of the priority order arrangements have been made to insure immediate relief for New England, where the enormous industrial demands for coal threaten to outstrip the supply.

The way was cleared for an increase in coal shipments by water to New England ports by an order directing all mines under contract to supply New England consumers with coal by water carriers, to deliver their maximum monthly requirements, effective December 1.

The order directs mines holding New England contracts to ship the maximum amount of coal called for by the contracts for consumption in the states of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island and Connecticut, where such coal is to be transhipped from rail to water carriers at Hampton Roads and at Baltimore. New England shipments are given preference over all shipments except coal requisitioned for railroad use and use of the government.

All coal producers holding New England contracts subject to the order are directed to file data as to their contracts with the United States Fuel Administration within ten days from the date of the order. The order gives New England Fuel Administrator James J. Storrow authority to supervise the distribution of this coal supply received by water after it reaches New England ports.

Western Railway Club Has Two Addresses

R. H. Aishton on Good Work Done by the Railroads

W. T. Krausch on Coaling Plants and Fuel Economy

At the meeting of the Western Railway Club, held at the Hotel Sherman, Chicago, on November 19, R. H. Aishton, president of the Chicago & North Western, gave an informal address, after which a paper on coaling plants and fuel was presented by W. T. Krausch, engineer of buildings of the Chicago, Burlington & Quincy. An abstract of Mr. Aishton's address and also of the paper by Mr. Krausch are given below.

RAILROADS ARE NOT BREAKING DOWN

Mr. Aishton spoke, in part, as follows: At this time we hear a great deal about the breaking down of the railroads. Their ability to handle the coal supply has been questioned and some have suggested that the government take a hand in operating the roads. The transportation system of this country could not be operated as efficiently as it is now if it were under government control. In the last 10 months 9,000,000 tons more coal was mined and moved than in 1916, amounting to 150,000 cars. The total traffic handled in this period was 751,000 carloads more than in 1916, or over 39,000,000 tons. This is a notable accomplishment and one of which the roads can justly be proud. The Chicago & North Western alone has moved 116,000 carloads of materials for the army camps, yet commercial traffic has gone on just the same, although this business is not on a normal basis but in most cases 150 per cent of the normal figure. Between August 1 and November 12, the railroads transported 1,200,000 soldiers, the movement requiring 2,750 extra passenger trains, but the usual business of the roads was carried on.

One of the things that makes the problem of handling the traffic a difficult one is the inability of the railroads to secure more equipment. The cars that have been received in the last 10 months have not made up for those destroyed in the same period and this statement will apply to locomotives as well. This is not due to lack of foresight by the railroads. They had ordered the equipment but the government needed it and the emergency confronting the nation was so much more serious that the railroads gave up the equipment and they held that by doing so they could help win the war.

When we hear criticisms of the railroads let us take into consideration just what they have accomplished. With no more facilities than in 1916, the roads have handled this year a traffic that is 16 per cent greater. This record is due to the brains and energy of the men working for the railroads, together with the assistance of the shippers. The shippers have played a big part in bringing about the increase in the tonnage handled. The Chicago & North Western is hauling an average load three and one-half tons greater this year than last year, which means a saving of 300,000 carloads for that road alone.

Deferred maintenance is slowly creeping into the railroad property. The roads have received this year less than half the rails they needed and the same statement applies to ties and ballast. Deterioration is going on just the same and some day we will have to make up for the deferred maintenance. People who read railroad reports and see that maintenance expenses are increasing think the properties are being kept up to the standard, but they are not. I do not believe in dire forebodings, however. I for one think that no matter what burden is placed on the transportation system of this country it is going to be found equal to it.

At this time the railroads are seeking more revenue. The case of the eastern carriers is being considered now and the

western roads will have a hearing later. I believe that the Interstate Commerce Commission will consider what the railroads have done and deal them justice. As to the future no man can predict, but in the words of John Paul Jones, I will say for the railroads, "We have not yet started to fight."

COALING PLANTS AND FUEL

By W. T. Krausch,

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COALING PLANTS

The subject of coaling plants is without question one of the most important to be considered in railroad operation, and it is receiving most careful consideration. Each particular plant is a study in itself, requiring careful design to meet the conditions under which it is to be constructed and operated. The main features controlling the design are, in general, as follows:

1. Capacity of plant.
2. Kinds of coal handled.
3. Daily consumption.
4. Type of cars used (gondola, box or self-cleaning).
5. Length of receiving hopper.
6. Number of tracks served with coal.
7. Whether or not weighing or measuring apparatus is to be considered.
8. Track clearances.
9. Whether or not coal is to be crushed or broken.
10. Kind of power required or available.
11. Whether or not coal is mixed.
12. Kind of construction (whether frame, steel or reinforced concrete).
13. Whether or not ground storage is to be considered.
14. Whether or not sand storage and drying are to be considered.
15. Whether or not cinder plants and pits are to be considered.
16. Fire regulations and protection.
17. Whether a terminal or isolated plant.
18. Location of plant.
19. Release of cars.
20. Switching.

These features are simply general and give an idea of the varied conditions which control the design. After having carefully studied the conditions under which the plant is to be constructed, we can decide on the type of structure to be used, and this, at times, is most difficult. The conditions just given, however, govern the type to a large degree. In this connection the following considerations play a most important part—namely:

1. The capacity of the plant.
2. The ground area covered by the structure.
3. Land value.
4. Number of tracks coaled.
5. Kind of cars used.
6. Kind of coal handled.
7. Whether or not weighing or measuring pockets are to be considered.

The cost of operation and maintenance of these plants is a vital subject. This cost varies to a great extent and is dependent on the following conditions:

1. Kind of cars used.
2. Simplicity of design.
3. Daily consumption.
4. Kind of care of machinery and power.
5. Kind of coal handled.
6. Labor operating plant.
7. Supervision.

The actual cost of operation and maintenance varies greatly and actual costs are only secured by keeping close record of the particular plant in question.

As an illustration relative to the cost per ton of handling coal, one man can unload a self-dumping or self-cleaning coal car of 40 to 50 tons capacity in about 30 minutes. On the other hand, one man can shovel out of a gondola car at an average of, say, 25 tons per day of 10 hours, based on fair run-of-mine bituminous coal. This simply illustrates the great variation in the cost of handling coal from self-cleaning cars and gondolas.

The types of plants now in general use may be classified

as follows, starting with the oldest type (eliminating, however, the old bucket and jib crane type and platform type):

1. Incline trestle type, with, say, maximum grade on incline of 5 per cent. 2. Steep incline trestle type, with grade from 20 per cent to 25 per cent. 3. Locomotive crane types. 4. Clamshell bucket type with trolleys. 5. Small bucket conveyor type (commonly known as the "mechanical" type). 6. Continuous belt type. 7. Large bucket type (in which buckets of a large unit capacity are used, from 1 to 2½ tons capacity, as, for instance, the Holmen or Krausch bucket type).

(1) *Incline Trestle Type*: This is one of the older types in use, and is designed to deliver coal to one or two tracks. It may be divided into three classes, as follows:

"A." A plant having measuring pockets of given capacity of from two to six tons on one or both sides, and of any desired number.

Coal cars are pushed up the 5 per cent incline by a locomotive, and coal is shoveled directly into the measuring pockets, the sides of the car being about on the level or preferably a little higher than the measuring pockets. In this type of plant, coal is handled in gondola and occasionally in box cars.

"B." A plant having storage bin or bins of any given capacity or number. Coal cars are pushed up the incline and placed directly over the storage bin. In this type of plant, all kinds of cars can be used, but the self-cleaning cars to great advantage. If the coal used is of such a nature as to require breaking, steel bars about ¾ in. by 4 in. in size are placed over the bin or bins and spaced the required distance apart, say 5 inches or more. Coal is dropped or shoveled directly on these bars and broken through and over them by means of large sledges.

"C." A plant having storage bin or bins of any given capacity with scale or measuring pockets, located directly under the bins. Coal is handled in this case precisely the same as in the second case, except that coal is fed into the scale or measuring pockets from the storage bin above, by means of controlling gates operated from below.

In the fixed charges for operating these plants, the cost of switching and placing cars on the trestle by a locomotive is not ordinarily included. This method is dangerous and great care must be used by the engineer in handling cars up and down the incline.

(2) *Steep Incline Trestle Plants, with Incline Grades of 20 Per Cent to 25 Per Cent*: In this type of plant, cars are pulled up the incline by means of an engine and hoist—usually located on top of and in the rear of the coal stations. The power may be either steam, gasoline, or electric. A general description would be the same as just given for the incline trestle type under "B" and "C," except for the steep incline. This type of station requires a much shorter incline, does away with a great deal of switching, and is much safer. It also increases the possibilities of providing storage room, and for plants of large storage capacity, is much cheaper than the low trestle type. Preferably the design is made for one or two tracks.

(3) *Locomotive Crane Type*: This type can be used to advantage under certain conditions; namely, at terminals. It requires from six to twenty minutes to coal an engine with a locomotive crane, depending on the amount and kind of coal handled. Coal can be handled directly from the car to the tender or from a pile to the tender. To avoid delay to engine service, cranes are operated to handle coal direct from the cars to the coal storage bin.

At terminals, the use of the crane has many advantages besides the direct handling of coal—namely, transferring coal from cars, handling cinders, handling sand, etc. Its value is great in emergency cases. In handling coal for fuel storage, it gives very satisfactory results.

(4) *Clam Shell and Large Bucket Type Operating on Trolleys*: These types are flexible, the clam shell type handling the coal directly from the car to the storage or bin. With the large bucket type, coal is handled from the cars directly to the hopper and fed by automatic gates into large capacity buckets. These buckets are arranged to insure full loading. They are hoisted in the elevator leg to the required height, then automatically locked into the trolley, which travels on a slightly inclined track, directly over the storage bins. The buckets are tipped automatically and coal is discharged at any desired point. These plants are designed with counter-balanced buckets. The clam shell type is used chiefly in commercial and power plant work.

(5) *Small Bucket Conveyor Type (commonly known as Mechanical Plants)*: This type has great flexibility to suit different conditions, and can be practically used for any location or situation.

These plants, if well cared for and equipped with proper machinery throughout, give excellent service. A general description of this type is as follows:

Coal is unloaded into the receiving hopper from any type of car, from there is fed by an automatic loader directly into the elevator boot, from there raised by the elevator directly to the storage bin above. There are several types of elevator—namely, the continuous and overlapping bucket type, and the pivoted type. These two types of elevators must run slowly, at a speed not to exceed, say, 50 ft. per minute. The pivoted bucket must run at slow speed on account of the method of loading and dumping the buckets. The continuous elevator necessarily runs slowly on account of its great handling capacity.

The rigid bucket is designed to run at a speed of about 100 ft. per minute, the buckets spaced to suit the capacity required.

Those plants may be equipped with scales, measuring pockets, crushers, overhead or below, with breaker bars over receiving hopper and, in fact, are most flexible and can practically meet any desired condition.

When these plants were first put into service, the chain for the elevators was commonly made of malleable iron. This, however, gave unsatisfactory results. The practice now is to use steel chain entirely, with most satisfactory results.

(6) *Continuous Belt Type*: A great many plants of this type have been erected in past years. This raises the coal to the storage bin or bins on a continuous belt of rubber or cotton, on an incline of about 30 degs. as a maximum. This type is not as flexible as the small bucket type or mechanical stations. Under good conditions, with a fair quality of coal and careful attendance, very favorable results have been obtained. The coal is unloaded into a receiving hopper from any type of car, and from there by loader onto the belt and is then elevated to the storage bins.

(7) *Large Bucket Elevator Type*: This type is one of the most recent and is gradually coming into use, due to its simplicity of design and low maintenance cost. The description is briefly as follows: Coal is unloaded from any kind of car directly into a receiving hopper and from there fed into buckets of one or more tons capacity. These are raised by means of a hoisting engine to the storage bin above and the coal is dumped automatically into the bin. These plants may be equipped with scales or measuring pockets, or breaker bars over the receiving hopper, and are economical as to first cost and operation. These plants may also be operated with one bucket and increased in units as desired, depending on the capacity of the plants. Buckets may also be placed on one side or on both sides, depending on the conditions. In using the two bucket scheme, the weight of one is counter-balanced by the weight of the other, one ascending while the other descends.

In order to reduce the cost of handling coal and mainte-

nance to a minimum, the following important factors must be considered:

1. The proper type of station to be selected to meet all the conditions. It must be understood that each station considered is a distinct and separate problem.

2. The use of self-cleaning cars is a most important factor.

3. Emergency storage.

4. Plants must be reliable, using the best type of machinery and appliances throughout with ample power; at important stations, where delays are serious, the feasibility of duplicate machinery must be considered.

5. Fireproof construction—steel or reinforced concrete or combination.

6. Where frame structures are erected, fire protection should be provided, the power house being built some distance from the coal station.

7. Switching reduced to a minimum—car puller can be installed at any ordinary plant.

8. Breakage of coal must be reduced to a minimum.

9. Good labor must be employed and proper care given all machinery and appliances.

10. A most important factor is supervision.

This briefly describes railroad coal handling plants. Their design and construction are being given most careful consideration so as to create the greatest fuel efficiency. The men operating the plants are selected so that we may get the best results. The power plants and mechanical installations are given proper inspection and the operations, supervision. Then, finally, it resolves itself into the effort to keep the plant doing good work and getting results.

I am bringing this to your particular attention to show that the railroads are, and have been, working most consistently along the line of fuel economy in their plants, not only in operation, but also in the design. The present cost of steel has played a most important part in the total cost of so-called fireproof plants. Consequently we decided on a substitute, and this is the result: A combination structure built of wood and reinforced concrete slabs, the posts, girts, beams and braces being of wood. The storage pocket walls and floors are of thin, reinforced concrete slab construction. The upper or lighter structure above the bin is of 2 in. concrete walls on heavy metal lath. Two of these plants are now under construction.

STATIONARY PLANTS

Now let us consider the stationary plant for a moment. Efficiency here means:

1. A properly designed modern power plant equipped with high class boilers, burning the right kind of coal, with efficient engines and equipment, handled by a competent engineer and fireman, and the necessary help under proper supervision.

How many plants are there like this and what is their total efficiency? Experts tell us that with a good steam engine, a good furnace, and a good boiler, a horsepower hour can be produced from one pound to a pound and a half of coal. We find, however, that the ordinary steam engine uses from three pounds to as high as twenty pounds. This gives us an opportunity to increase our efficiency in a great many ways. The engineer in charge of operating the plant must be competent, the fireman must be competent, and they must have proper supervision. The boiler settings must be tight, and the draft regulated for the best results. The fire bed must be kept the right depth to suit the work. Further, the engineer and fireman should learn a little chemistry.

I firmly believe the way to get results is to take the plant you have and examine it most carefully. Get after the air leaks, steam leaks, and water leaks, get proper firing, the right kind of coal, proper draft and regulation, get rid of the soot and scale. Install proper grates and stokers. See that

the engines, generators, pumps and other equipment are in good order, working without leaks or waste. Use the proper lubricants and packing. Insist on performance and maintenance records, get the right man on the job and, above all, give the plant constant and proper supervision.

THE LOCOMOTIVE

The condition under which the locomotive operates is entirely different from other types of power, operating at high and low speeds, over grades, under maximum and minimum loads, in all kinds of weather, and under the most severe strains. Modern locomotives are now usually equipped with superheaters, which will save 20 per cent of the coal, with a superheat of 200 deg. F. If the engines are careless and carry the water too high or allow the boiler to foam, much of the possible saving is lost, due to the reduced temperature of the superheated steam. In winter, a locomotive will burn as much as 25 per cent more coal than in summer to haul the same tonnage.

The railroads, by using larger types of power, are constantly creating higher efficiency, as they are more efficient and there is a considerable saving in coal because they reduce the number of trains (which means less delay at meeting points), which increases the fuel consumption.

Railroads have organizations specially fitted to cope with the problem of fuel economy, which means that individual supervision and instruction are given to each and every engineer and fireman.

DISCUSSION

L. R. Pyle (Soo Line) brought out the fact that there was a considerable waste of transportation facilities and fuel at this time, due to the fact that coal is not being properly cleaned. He recommended that the railroads give more attention to fuel at the mines and also urged the centralization of authority in matters pertaining to the handling and use of fuel on every railroad. W. E. Dunham (C. & N. W.) expressed the opinion that much more could be done by the railroads to save fuel. Under the prevailing prices a small saving justifies a relatively greater expenditure than heretofore. Other speakers mentioned the savings to be secured by designing tenders to prevent the loss of fuel and by equipping stationary plants with superheaters and feed water heaters.

OIL GAS FOR TRAIN LIGHTING.—Those railway companies who use gas for their train lighting have every probability of being hit shortly by a scarcity of the oil from which the gas is compressed. Already some of these companies are experimenting with mixtures of oil and coal gas, but the results are not satisfactory; even the addition of only 25 per cent of coal gas makes a very indifferent light, while, of course, a mixture of half oil gas and half coal gas would be considerably worse. In this connection it may be remarked that it was long ago recognized that could trains be lighted satisfactorily by coal gas there would be many advantages. The gas could be obtained from the gas mains and there would be no need for compressing plants nor for the traveling gas containers. Experiments were made by some companies, e. g., the London & North-Western and Great Western, but it was not seen how the difficulties could be overcome. The matter was not, however, seriously pressed because of the gradual greater use of the electric light for train lighting. This, though, cannot be accepted as the available remedy for the shortage of oil at this time. On account of the scarcity of labor and the difficulty that would be experienced in getting the material—as it has to be obtained from sources that are very busy at the present time with war work—it is out of the question installing vast equipments of electric train lighting just now.—*Railway Gazette, London.*

A Study of Transverse Fissures in Steel Rails*

A Discussion of the Conditions Leading to This Type of Failure; Consideration of the Protective Measures

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ON August 25, 1911, a rail failed on the Lehigh Valley, causing a disastrous wreck. The surface of the fracture was in a plane at right angles to the length of the rail. There was a dark-colored, oval spot on this surface, located on the gage side of the head, representing the part of the rail which was the first to fracture. The nucleus of this spot showed that the fracture had an interior origin. Other fractures of this kind, the peripheries of which had not reached the surface of the rail, presented surfaces having a silvery luster. The darkened surface of the present fracture was caused, doubtless, by the air having had access to it.

This fracture was recognized as a fatigue fracture of a modified type, its interior origin having been due to a component in the rail which is not usually present in cases of fatigue fractures. The metal next the running surface of the head of the rail was in a state of internal compression, this being the component not commonly met with in other cases, and which caused the fracture to have its interior origin. For the purpose of giving this modified type of fatigue fracture a specific name for identification, the term "transverse fissure" was applied.

No mystery was thought to attach to its formation, or to its development. The explanation of its occurrence seemed obvious in the light of common knowledge upon the behavior of steel under repeated alternate stresses. By reason of the state of internal compression at the running surface, the maximum tensile stresses in the head, under bending loads, were along an interior element. Here the tensile strains were higher than in the fibers more remote from the neutral axis. Under such conditions the fracture of the rail would be expected to have an interior origin. A discussion of the subject of transverse fissures essentially becomes a discussion of fatigue fractures, since they are believed to be identical.

The descriptive term, employed merely for the identification of this type of fatigue fracture, had the appearance of creating alarm. Apprehensions arose that a new phenomenon in the physical properties of steel had presented itself, the explanation of which was sought in every detail in the manufacture of the rail, omitting consideration, however, of the effects of service conditions, where the explanation really lay. Under this illusory search the subject soon took on a nebulous state; the distinguishing characteristics of a transverse fissure were lost sight of, and quite dissimilar fractures were reported under the same general terminology.

Brittleness of fracture in all grades of steel is characteristic of fatigue tests. Brittleness under repeated stresses, therefore, does not constitute evidence of defective or inferior metal. Primitive toughness is of value to meet occasional overloads at certain stages, but its value in prolonging the life of steel under repeated alternate stresses of moderate degree, if it has an influence, is not known. There are certain zones for each grade of steel within which its endurance is practically unlimited, and above which repeated stresses soon result in rupture. A fatigue fracture may be made in any piece of steel. It is only necessary that a given load shall be repeated a sufficient number of times, when rupture will ensue.

FIBER STRESSES SHOULD BE RESTRICTED

It would be prudent to restrict the fiber stresses in rails to less than 40,000 lb. per sq. in. It is ignoring general engineering practice and precedent to apply loads to a structure having no residual strength above the working loads. The occasional application of stresses in excess of this limit constitutes a menace to the integrity of the steel, although the working loads, in general, do not reach this maximum. If it shall appear that rails are subjected to stresses in service which approach or exceed the above-mentioned fiber stress, then their failure by fatigue will present no novel feature.

Steel rails in the track are subjected to bending stresses, the magnitude of which depends primarily upon the amount of the wheel loads; the number of repetitions within a given interval of time depending upon the density of traffic. The values of the static wheel loads admit of accurate determination. It is known that such loads are greatly exceeded when the trains are in motion.

Concerning the fiber stresses in the track under slowly moving locomotives, observations were made by the writer in 1893 and 1894, the results of which were published in the reports entitled "Tests of Metals." Even under the lighter equipment then in use, it was found "that rails were often strained higher than material is supposed to be in the case of bridges and other permanent structures." It was then brought out that wheel spacing influenced the results; that the leading pilot wheel caused much higher stresses per ton of wheel load than other wheels of the locomotive; that tie spacing did not afford the basis for computation of the fiber stresses, the wheel load and the moment of resistance of the rail being known; and that different kinds of ballast influenced the results.

At that time a rail was selected, representing good track conditions, and measured on frozen gravel ballast. It showed a variation in measured strains in different parts of its length of over 100 per cent, referring to the effect of one of the driving wheels. The aggregate longitudinal tension from eight wheels, at one place on the rail, was nearly three times that at another place along its length, while the compressive stresses displayed at one place were 10 times those measured at another place. The measured strains, although taken in the track 22 years ago, should effectually dispel any illusions that rails are uniformly strained, even under static conditions of loading.

In these early tests, the fiber stresses ranged from 10,000 to 18,000 lb. per sq. in. under the heavier wheels of the locomotives. There are more recently published accounts of fiber stresses, measured under trains traveling at moderately high rates of speed, the values of which range from 25,000 to 30,000 lb. per sq. in. with higher maxima in occasional observations in tension, the stresses being greatest in the base.

Rails in service not infrequently show appreciable local bends, acquired after they have been in the track. These bends represent permanent sets given the rails by loads which have exceeded the elastic limit of the steel. Some rails are bent downward at their ends, others are bent at regular intervals corresponding to the length of the peripheries of driving wheels of locomotives which have been over the

*Abstracted from a paper to be presented before the New York meeting of the American Institute of Mining Engineers, February, 1918.

rails, the latter permanent bends being due to the dynamic augment of the drivers.

There are internal strains in rails which result from conditions attending their manufacture, and those which are acquired after the rails have reached the track. During fabrication, cooling strains are acquired. The shape of a rail is such that it is peculiarly susceptible to the acquiring of strains under ordinary conditions of cooling. The stage at which these cooling strains are chiefly acquired is after the rail has left the last pass of the rail mill, and has become a finished rail.

Normally, the parts first to cool are temporarily put into a state of internal tension, which is reversed to a state of compression when the entire mass has reached atmospheric temperature. When the rail is cold, it is common to find the flanges in a state of internal compression, with the metal along the middle of the base in a state of tension. At the junction of the web with the head and the base, a state of tension is common. The peripheral metal of the head is left in compression, with the interior of the head in tension. The cooling strains are usually much greater in the base than in the head of the rail. Cooling strains in the flanges of thin-flange rails have been found as high as 18,000 lb. per sq. in. compression, with metal in close proximity at the middle of the base in a state of tension. Longitudinal strains are referred to in these remarks. It is obvious that shearing strains will be set up by these contiguous internal strains of tension and compression.

The usual initial state of compression in the flanges may be reversed to tension by cold-bending the rail, accomplished by an overload of compression on the base. Gaggling is merely applying an overload, causing a permanent set in the rail, and setting up new internal strains for the purpose of initially straightening it. It disturbs the primitive state of strain left by cooling, leaving the rail in a state of critical equilibrium from which it is again easily disturbed by track conditions.

When the rail reaches the track, cold-rolling of the running surface of the head takes place under the action of the wheel pressures. The top of the head then acquires a higher state of internal compression than left by normal cooling, the strains in the head acquiring an ascendancy over those of the base. Internal strains of compression next the running surface have been found in rails from the track corresponding to over 20,000 lb. per sq. in. stress.

INTERNAL STRESSES FROM WHEEL LOADS

Internal strains from wheel loads are unavoidable. The hardest rails are not exempt from this action of the wheels, nor do the lower wheel loads fail to introduce internal strains. An experimental inquiry into the effects of wheel pressures showed that a wheel load of 15,000 lb. introduced strains that were higher, superficially, than those resulting from the higher wheel loads of 25,000 and 35,000 lb. It was also noted that rerolling with 35,000 lb., after lower wheel pressures had been used, resulted in diminished internal strains over those due to the lower pressure. Furthermore, peining the surface with a light hand hammer introduced internal strains of greater magnitude than witnessed in either the experimental rails or those from the track.

In this connection, it is necessary to take into account the volume of the metal directly affected by the cold-rolling, and also the effect of repeated alternate stresses on the physical properties of the steel. The depth of penetration was found to be greater with the higher wheel loads than with the lighter loads or with the peining. The ratio of the volume of metal directly affected by the cold-rolling to that of the reacting metal is also a matter for consideration. The interior of the head is put into a state of tension to balance the volume of metal which is in a state of compression. Tensile stresses in the interior of the head equivalent to the measured strains have reached values of 8,000 to 9,000 lb. per sq. in.

COMPONENTS WHICH CAUSE FATIGUE FRACTURES

Of the two components which tend to cause fatigue fractures in steel rails, it will be borne in mind that one of them, namely, the state of internal compression at the running surface of the head, and the concomitant state of longitudinal tension in the interior of the head, will be introduced by the lighter wheel loads as well as by the heavier ones. These internal strains act upon the entire length of the rail. The direct bending stresses, the other component, will depend upon the wheel loads. If not strictly proportional to the wheel loads, still the bending stresses will be greater as the wheel loads are increased. Again stated, the two components which tend to cause fatigue fractures are the direct bending stresses from the wheel loads and the internal strains introduced by the cold-rolling of the wheels on the head of the rail. The latter are responsible for a disturbance in the physical properties in addition to the introduction of internal strains.

It is of importance to acquire data upon the relative effect of these two components in an endeavor to ameliorate conditions and prolong the life of the rail. Interest centers upon that influence which causes the maximum longitudinal tension, since a fatigue fracture is one of tension. The prompt display of transverse fissures in rails of 125-lb. weight leads to the inference that the cold-rolling component is of grave importance, which may be greater relatively than the direct bending stresses. There have been examples of rails sustaining traffic after the head had been practically separated by the development of a transverse fissure. The web and base of the rail, for the time, resisted the bending stresses, illustrating the ability of the steel to endure very high fiber stresses for a limited number of repetitions.

Primarily, it is desirable to ascertain, by means of direct experimental inquiry, the ability of steel rails to endure repeated alternate stresses, acquiring this information upon the rail in the condition in which it comes from the rail mill, and before any cold-rolling by wheels in the track has taken place. The section of the rail is such that opposing cooling strains are necessarily present in the finished rail. There is no assurance that a rail in full cross-section will display the endurance under repeated alternate stresses which carefully prepared bars of the laboratory have shown. Tests of this general nature on rails of full cross-section have yielded results which emphasize the need of this information.

Next, it is important to ascertain the limit of endurance of rails which have been in the track and have acquired a state of internal strain. There is no apparent reason why this barrenness of fundamental data upon steel rails should longer continue. In the use of materials of construction, two features should be known: The ability of the material to endure stresses, in the form in which it is used; and knowledge of the magnitude of the stresses which are to be endured. The steel-rail problem presents an example in which neither of these basic considerations has been definitely known. This dearth of relevant information is mentioned since its absence has led to many unsupported conjectures as to the causes of rail failures.

Transverse fissures occur in the head, and not in the web or the base. They commonly make their appearance on the gage side of the head, or central over the web. In a lot of 663 transverse fissures, 535 were located on the gage side of the head, 128 over the web, and none on the outside of the head. The preponderance of transverse fissures on the gage side of the head is significant, of course. Conditions of loading commonly reach a maximum on the gage side of the head.

It has been found that transverse fissures made by progressive gaggling of new rails can be located at will on the right or the left side of the head or central, according to the manner of applying the load. It is only necessary to apply the load to the side of the head on which it is chosen to

locate the fissure, to accomplish that result. Twenty-four transverse fissures were experimentally made in new rails by progressive gagging. By progressive gagging is meant that the rail was gagged at close intervals along its entire length, first on the head and then on the base, repeating the process until rupture ensued. The number of blows required to be struck at any one place ranged from 800 to 4,000. The total number per rail length of 33 ft. was from 50,000 to 250,000 blows.

The bending stresses given the rails in these tests were in excess of those experienced in the track, a circumstance which led to their rupture before the usual burnishing effect was accomplished which the opposite faces have upon each other in producing a silvery luster; rupture also being completed before the nuclei of the fissures had extended and covered a large part of the cross-section of the head. Efforts to produce transverse fissures by repeated gagging in one plane only were unsuccessful. Such rails displayed the common type of fatigue fracture; that is, the fractures had exterior origins in each case. Progressive gagging has an effect akin to the cold-rolling of the wheels.

In rails from the track, transverse fissures have been found along the same element of the head, in different stages of development. This manifestation corresponds to the shattering effect of repeated alternate stresses witnessed in laboratory test bars which have been exposed to a uniform bending stress over a part of their length.

Critical examinations have shown transverse fissures to have their origins in metal microscopically sound and normal in structure. Diligent research has failed to reveal micro-defects to which the origins of the fractures could be attributed. The composition of the steel at and in the vicinity of the fissures has shown no chemical reason why the fissures should have their origins at the places where they were found.

There has been no example of a transverse fissure in a rail which has not been in service, excepting experimental fissures. Rolling conditions would preclude the presence of a transverse fissure in an advanced stage of development in a new rail. The reduction of the metal in the rolls orients slag and other inclusions, arranging them in a direction parallel to the length of the rail, and not crosswise.

It is well known that slag inclusions are present in some degree in most steels. Slag filaments are drawn out and may be detected in the cross-section of the rail. In longitudinal sections they are at times prominently shown; but such longitudinal seaminess, when it exists, has no connection with the formation of transverse fissures. Composite sketches showing longitudinal seaminess in parts of the head remote from the places occupied by the nuclei of transverse fissures necessarily have no bearing upon the question of the development of transverse fissures.

It not infrequently happens, however, that longitudinal seams of another kind are developed in conjunction with transverse fissures, wheel pressures being the common cause for each. Shearing strains are set up in the head of the rail by the wheel pressures. When an acicular streak is reached, which may represent a slag inclusion, opportunity is afforded for the starting of a longitudinal seam. Shearing fractures which develop in vertical planes are designated as split heads. In other cases, the separation takes place in horizontal or oblique planes, and these latter may be developed independently or associated with transverse fissures. Each of these types of rupture was represented in the rail which failed on the Lehigh Valley.

EFFECT OF GAGGING

The effect of gagging has been referred to in respect to introducing internal strains or in modifying those which preexisted. Rail sections were subjected to normal and excessive gagging, also to the more severe ordeal of being

struck with the tup of a drop-testing machine. Microscopic examination directed to ascertain the effect, if perceptible, did not show any appreciable distortion of structure either at the places directly acted upon or in other parts of the cross-sections of the rails. Microscopically, the mill scale on the surface of the rail was disturbed in the vicinity of the place gagged or struck with the tup of the drop-testing machine. Surface indications comprised all that was visible resulting from this treatment.

Attention has so generally centered upon the results of the drop test, the bending test, or the tensile test, in respect to the display of primitive ductility, that the phases through which rupture is reached by repeated stresses have not received adequate consideration. Specifications governing the acceptance of the metal rigorously demand that a certain elongation shall be displayed. The elongation called for may be only a few hundredths of an inch per inch of length of sample, but such display is made the decisive measure for the acceptance of the steel. It would not be incompatible with experimental results for the steel which was deficient one-hundredth of an inch in its primitive display of elongation to show under repeated stresses an aggregate elastic extension of several miles, so radically different may be its primitive behavior and its behavior under long-continued alternate stresses.

In like manner, chemical requirements are frequently made the object of exact fulfillment. Without advancing other reasons, the cause of the failure of materials under service conditions has been attributed to some slender deficiency in fulfilling the specifications on which the material was supposed to be made. It is not always clear that the most suitable steel for the purpose is asked for in specifications.

Attributing the cause of failure of a rail to the use of one deoxidizer or another, or to an excess of some non-metallic constituent above prescribed limits, can hardly carry conviction in the absence of information which connects them as cause and effect, if they stand to each other in that relation.

It is desired to emphasize the fact that the durability of a rail consists of its ability to retain its integrity under repeated deformations. A direct test consists of subjecting the rail to repeated deformations, conducted upon the shape and dimensions in which it is used. The results of other tests may be accepted as indexical of the properties desired, provided the relations between the two are established. In general, however, direct methods are preferred to indirect ones.

TRANSVERSE FRACTURES ARE FATIGUE FRACTURES

In conclusion, a quotation will be presented from a recent report issued by the Interstate Commerce Commission, Division of Safety, embodying remarks by the writer on the investigation of a rail which failed in the track, displaying a number of transverse fissures:

"Neither chemical analysis nor microscopic examinations have shown a definite cause for the development of transverse fissures. They have occurred in rails of different weights; in those of different ingot positions; in the product of each of the two great methods of steel making, Bessemer and open-hearth; in direct-rolled rails and in those from reheated blooms; over ties and between them; they have made their appearance in the different seasons of the year, and in rails rolled in the different seasons; they occur where, according to chance, the rails may have been gagged and from the number and proximity of the fissures, where they probably were not gagged, they have displayed themselves singly, and independent of other types of rupture, and also associated with shearing fractures or seams which have developed in planes at right angles to the fissures; they are found in the head and not the base of the rail; they appear in rails which show very little wear; they are not confined to any one railmill, nor to northern or southern mills, nor to any one year's rolling, but have been displayed by rails rolled at periods of time separated by not less than two decades. The latter fact should remove doubts concerning any peculiar

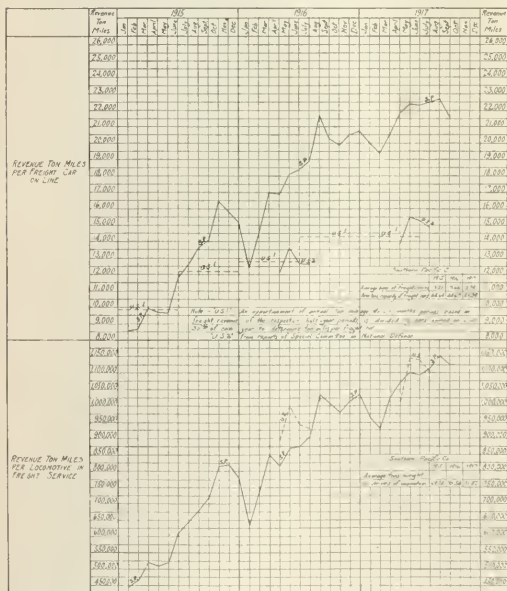
conditions having found their way into modern mill practice influencing this type of failure.

"On the other hand, traffic has increased, wheel loads have increased, and speeds have increased; and transverse fissures are in general found where these conditions are well advanced. The girder strength of the rails has been increased, while the impinging pressures of the wheels still remain without amelioration. It is a disquieting matter that rails of the heavier sections recently laid have displayed transverse fissures. Mere increase in weight of section has not brought with it immunity from failure in this manner. It gives emphasis to the need of acquiring further data upon the features which have been discussed in this report.

"The conclusion seems well founded, the transverse fissures are fatigue fractures, and that they develop in rails which are structurally free from any known defect. It is a modified type of fatigue fracture in which there is a compressive component in the rail next the running surface of the head. The presence of this compressive component accounts for the interior origin of the transverse fissure. It constitutes the difference which the introduction of the term 'transverse fissure' was intended to emphasize over the common type of fatigue fracture in which this component is absent and which in consequence thereof has an exterior origin."

INCREASED EFFICIENCY IN USE OF EQUIPMENT

The accompanying chart was prepared for the officers of the Southern Pacific for the purpose of showing the remarkable increase in efficiency in the use of motive power and equipment, especially during the last two years. This is the result both of the great increase in traffic and of the heavier loading per car and per train as well as of unusual efforts



Revenue Freight Traffic Per Unit of Equipment Southern Pacific Co. and All Railroads of United States

to increase the mileage of each car and locomotive per day. It will be noted that the revenue ton miles per car on line on the Southern Pacific increased from something over 8,500 in January, 1915, to over 22,500 in August, 1917, while the revenue ton miles per locomotive in freight service increased from about 450,000 in January, 1915, to 1,150,000 in August, 1917. The chart shows the almost steady increase, in comparison with the average for all roads.

RAILWAY REGIMENTS AT CAMP GRANT

In addition to the nine regiments of railway engineers now in France two additional regiments composed mainly of railway men are now being organized at Camp Grant, Rockford, Ill., and will soon be ready for service. These are the Twenty-First Engineers, for light railway construction and operation, commanded by Col. Ernest D. Peck, and the Thirty-Fifth Engineers, a shop regiment, commanded by Col. A. E. Waldron. The roster of officers of the Twenty-First Engineers is as follows:

Regimental Headquarters: Colonel Ernest D. Peck, commanding officer, regular army; Lieutenant Colonel Hiram J. Slifer, formerly general manager, Chicago Great Western; Major Lunsford E. Oliver, supply officer, regular army; Captain David P. Banks, superintendent terminals, Louisville & Nashville, Evansville, Ind.; First Lieutenant George E. Miville, adjutant, regular army.

Headquarters First Battalion: Major Marshall R. Pugh, commanding, consulting engineer, Philadelphia, Pa.; Captain Arthur J. Minor, assistant engineer, Southern Railway; First Lieutenant Paul V. Brown, exchange officer, assistant engineer, Chicago & Alton.

Headquarters Second Battalion: Major Thomas R. Ryan, commanding, general manager, Brazil Railway, Paulo, Brazil; Captain Harry R. Gabriel, assistant chief engineer, Argentine Railway.

Company A: Captain Robert R. McGregor, commanding, assistant engineer, Southern Pacific; First Lieutenant Lewis G. Waterbury, assistant superintendent, Ponce & Guyana R. R., Porto Rico; First Lieutenant Charles R. Woods, land agent, Elgin, Joliet & Eastern Ry.; Second Lieutenant Harry E. Comfort, civil engineer; Second Lieutenant Matthew S. Butler, division engineer, Minneapolis, St. Paul & Sault Ste. Marie; Second Lieutenant Chester H. Plimpton, mess officer, mechanical department draftsman, Pennsylvania Railroad.

Company B: Captain Earl W. Evans, commanding, superintendent construction, New Orleans Terminal Company; First Lieutenant William N. Briscoe, draftsman, Baltimore & Ohio; First Lieutenant Charles T. Butler, engineer, Pennsylvania Railroad; First Lieutenant Morris B. Pumphrey, assistant engineer maintenance, Chicago, Ottawa & Peoria; Second Lieutenant Richard S. McCabe, timekeeper, Baltimore & Ohio; Second Lieutenant Scott D. Christopher, assistant engineer, Illinois Central.

Company C: Captain Michael M. Sheedy, commanding, safety inspector, Pennsylvania Railroad; First Lieutenant Otis T. Gregg, secretary, Gregg Company, Ltd., Hackensack, N. J.; First Lieutenant Hudson D. Dravo, road foreman of engines, Philadelphia, Baltimore & Washington; Second Lieutenant Charles M. Greeley, special mechanical apprentice, Pennsylvania Railroad; Second Lieutenant Arthur B. Helwig, mechanical inspector, Pennsylvania Railroad.

Company D: Captain James P. Nash, commanding superintendent terminals, El Paso Southwestern; First Lieutenant John M. Kimmel, Jr., assistant engineer, El Paso & Southwestern; First Lieutenant John S. Kiesel, assistant foreman, Pennsylvania Railroad; Second Lieutenant Edward P. Walsh, superintendent construction, Walsh Construction Co.

Company E: Captain William R. Scott, commanding, secretary, Joint Car Association, El Paso, Texas; First Lieutenant John C. Rill, trainmaster, Pennsylvania Railroad; First Lieutenant Robert A. Radford, assistant engineer, Lehigh Valley; First Lieutenant George C. Lightner, assistant engineer, Canadian Government Railways; Second Lieutenant Clarence J. Derrick, special engineer, Cleveland, Cincinnati, Chicago & St. Louis; Second Lieutenant Ray L. Hufford, concrete construction engineer.

Company F: Captain Frank T. Bowles, commanding, assistant superintendent transportation, San Antonio & Aran-

sas Pass; First Lieutenant Raymond H. O'Brien, electrical engineer, Pennsylvania Railroad; First Lieutenant Philemon S. Lewis, trainmaster, Philadelphia & Reading; First Lieutenant Harry E. Gabriel, assistant superintendent, St. Louis-San Francisco; Second Lieutenant Harry W. Dun, Jr., resident engineer, Atchison, Topeka & Santa Fe.

Attached: Captain Alfred B. Lewis, casual officer, locating engineer, Alaska Northern; Captain Clarence Roberts, road foreman engines, Pennsylvania Railroad; Captain Jesse G. Lorton, superintendent, Illinois Central; First Lieutenant Harvey W. Bell, general manager, Bell Locomotive Works; First Lieutenant Alfred D. Chandler, mechanical engineer, Baldwin Locomotive Works; Second Lieutenant Charles S. Hechner, mechanic, Philadelphia & Reading; Second Lieutenant Maurice E. Vermillion, regular army; Captain Hector Mansfield, assistant trainmaster, Philadelphia & Reading; Second Lieutenant James F. Ross, regular army; First Lieutenant R. L. Mock, assistant superintendent, Atlanta Joint Terminals; First Lieutenant A. O. Spurr, general yardmaster, Baltimore & Ohio.

Medical Department: Major James B. Hastings, surgeon; First Lieutenant Carl H. Bartling, assistant surgeon; First Lieutenant James H. Ross, dental surgeon.

THIRTY-FIFTH ENGINEERS

Regimental headquarters: Col. A. E. Waldron, commanding officer, regular army; Lieut.-col. G. H. Vincett, manager of plant, Standard Steel Car Company; Capt.-adj. Herman C. Huffer, Jr., of Huffer Campbell & Company, bankers, New York, and vice-president Augusta Southern Railway, president, Atlantic & Western and director Georgia & Florida Railway; Capt. James T. Blackstock, manager of shop, Standard Steel Car Co., and Captain W. C. Cole.

Headquarters First Battalion: Maj. Joseph F. Surridge, superintendent, Canadian Car & Foundry Co., and Capt. William E. Abbot, retired army officer; Capt. Robert Tinsley, formerly superintendent at Pullman Company's shops, Pullman, Ill.; First Lieut. Paul E. Carter, sales department, General Railway Signal Co., New York.

Headquarters Second Battalion: Maj. John S. Douglas, superintendent, Eastern Car Company; Capt. Herlof Amble, foreman erecting shop, Standard Steel Car Co.; Capt. William C. Lindner, assistant general foreman, mechanical department, Pennsylvania Railroad; First Lieut. F. W. Hausmann, electrical and consulting engineer, Allis-Chalmers Co., Milwaukee.

Headquarters Third Battalion: Maj. Thomas A. Dooley, Jr., Capt. W. L. Tedford, supervisor, Pullman Company; Capt. Charles F. King, First Lieut. Earl J. Zinck.

Company A: Capt. Hill P. Wilson, junior assistant valuation engineer, Texas & Pacific; First Lieuts. James M. Morse and Fletcher J. Snow; Second Lieuts. James C. Lamb and N. C. Raabe, machinist and electrician, Standard Steel Car Co.

Company B: Capt. Joseph W. Moore, assistant engineer, valuation department, Illinois Central; First Lieuts. Russell M. Smith, assistant road foreman of engines, Pennsylvania Railroad, Wilbur Oglesby, superintendent, South Georgia Railway, and A. W. Holbrook; Second Lieuts. Adam C. Warfel, safety engineer, Hartford Accident and Indemnity Company, and Robert M. Totten, draftsman, Standard Steel Car Co.

Company C: Capt. William R. Pearson, assistant valuation engineer, Nashville, Chattanooga & St. Louis; First Lieuts. John E. Brown, O. S. Dickson, motive power inspector, Pennsylvania Railroad, and Don L. Clements, foreman, New York Central; Second Lieuts. Ralph F. Getz, Benjamin G. Helsel, clerk, Standard Steel Car Co.

Company D: Capt. E. Burton Hocker; First Lieuts. Fred C. McFarland, civil engineer, Pennsylvania Lines West, John S. Wetherill and Howard Dyke, foreman, Standard

Steel Car Co.; Second Lieuts. Frederick W. Ford, junior draftsman, Boston & Maine, and Robert J. Byron, shop foreman, Pennsylvania.

Company E: Capt. Frederick N. Hatch; First Lieuts. Richard E. Trippe, assistant engineer, Atlanta & Anderson Construction Company, Walter Budwell, roundhouse foreman, Norfolk & Western, and James L. Blair, inspector, Standard Steel Car Co.; Second Lieuts. Roland G. Stafford, structural draftsman, Boston & Maine, and Harry Darling-ton, Pittsburgh Forge & Iron Company.

Company F: Capt. H. Fueller, night superintendent, Ralston Steel Car Company; First Lieuts. Merle V. Holmes, office engineer maintenance department, Atchison, Topeka & Santa Fe; Walter S. Mack, David Halderman, foreman, Standard Steel Car Co.; Second Lieuts. E. B. Wilkinson, James W. Ryan, assistant erecting shop foreman, New York Central.

Company G: Capt. William G. Vincett, Standard Steel Car Co.; First Lieuts. L. T. M. Ralston, Pennsylvania State highway department, Arthur F. Ainslie, assistant engineer, maintenance of way, Northern Pacific, William J. O'Brien, order foreman, Standard Steel Car Co.; Second Lieuts. Leo J. Stein and William E. Doll.

Company H: Capt. Wilke Woodard, consulting engineer; First Lieuts. William F. Philbrick, assistant yardmaster, Norfolk & Western; Horace M. Fetterolf and H. B. Gaither, inspector of locomotives, Baltimore & Ohio; Second Lieuts. Reginald V. Offutt, machinist, Baltimore & Ohio.

Company I: Capt. Reuben L. Rockwell, engineering department, Illinois Steel Company; First Lieuts. John F. Weiss; William S. Mussenden, field engineer of construction of steel plant for Mark Mfg. Co., South Chicago; Second Lieuts. C. C. Manchester, R. C. Montgomery, assistant purchasing agent, Philadelphia & Reading.

ENGLISH YACHTS BECOME FREIGHT CARRIERS.—Second-hand steam yachts are being turned into cargo carrying boats in England and they are finding ready purchasers at good prices. The royal yacht of Siam, the "Maha Chakrri," has been sold for conversion into a trader. The steam yacht Dotterell, which sold four months ago for £3,800 (\$18,470) has been resold for £10,000 (\$48,600) and has been altered into a cargo carrier.

THE PRESENT IMPORTANCE OF THE SCRAP HEAP.—In present circumstances the scrap heap in a locomotive shop assumes an importance which has never been accorded to it hitherto. Owing to the unusual demand for iron and steel products of all kinds, much difficulty is being experienced, and this condition of things must necessarily continue for some time. There is a natural shortage of material in locomotive and railway car shops as elsewhere, and this is not confined to new work alone, but extends to the repair department likewise. Wherever material can be reclaimed from the scrap heap its use may be of considerable advantage in assuring a continuous and adequate supply at all events of certain classes of material. The ever-increasing cost of metal and other requirements places upon those concerned the obligation of utilizing to the utmost all available supplies, and if recourse to the scrap heap makes it possible to complete work which otherwise would have to stand over for a considerable period, that plan would have every justification. It is necessary in reclaiming material previously scrapped to exercise considerable care in selection, and at best only a percentage is fit for re-employment in the shops. No matter how extensively reclaimed material may be used there are always large quantities which cannot be employed for building or repairing work in locomotive shops, and this, in the ordinary course, must be sold; but it may, however, serve a highly useful purpose when diverted to other channels.—*Railway Gazette, London.*

General News Department

The machine shop and blacksmith shop of the Grand Trunk at Brockville, Ont., were destroyed by fire on November 24.

The fourteenth annual convention of the National Rivers and Harbors Congress, which was scheduled to meet in Washington, December 5, 6 and 7, has been postponed until further notice.

Subscriptions to the second Liberty Loan by officers and employees of the Southern Pacific (Pacific system) and affiliated electric lines amounted to \$1,445,950, as compared with \$1,463,800 for the first Liberty Loan.

T. C. Powell, of Cincinnati, Ohio, vice-president of the Southern Railway, has been appointed by Judge Lovett as a member of the Priorities Committee of the War Industries Board of the Council of National Defense.

An agreement recently reached between the Illinois Central and its telegraphers provides for a readjustment of working hours and an increase in pay of \$9.75 a month. The settlement was effected through the efforts of G. W. Hanger of the Federal Board of Mediation and Conciliation.

The Texas & Pacific at the beginning of the crop season this year instructed section foremen each to plant and cultivate not less than three-quarters of an acre of ground upon the right of way. The men were allowed time to work these gardens, and they planted and harvested bountiful crops on about 400 acres of the company's land.

The highway department of the State of Pennsylvania has bought 15 snowploughs, to be used in keeping the highways open during the coming winter for heavy motor-truck traffic across the state. It is estimated that at present 200 automobiles are being sent eastward through Pennsylvania every day from the large manufacturing centers west of there.

In Toronto, Ont., this week, an exemption board, examining men drafted for the army under the Canadian conscription law, exempted, for a period of one year, Omer Lewis, a ticket seller of the Grand Trunk; indicating that this man's occupation is a war necessity. On the application of a yard foreman, 23 trainmen of the Grand Trunk were exempted, the railroad company promising to give prompt notice if any one of these 23 should leave the railroad service.

The Interborough Rapid Transit Company, New York City, operating subway and elevated railroads, is employing women in station service, giving preference to dependent women of the families of employees who are in the military or naval service. (In the ticket offices of elevated railway stations in Brooklyn women have been employed for many years.) The New York Railways Company, controlled in the interest of the Interborough, is to employ women as conductors on surface street cars.

The Association of American Railway Accounting Officers is to issue a book containing a synopsis of its recommendations and decisions affecting freight and passenger accounts, including the association's standard freight and passenger forms. The freight synopsis and the passenger synopsis will be under one cover, but separate each from the other. One copy of the Synopsis will be furnished to each member free. Additional copies may be obtained at one dollar each (if ordered soon) from E. R. Woodson, secretary, Washington, D. C.

In the County Court at Buffalo, N. Y., November 16, Paul Vogel, 29 years old, a yard clerk of the Lehigh Valley, was sentenced to imprisonment for from four years to eight years for grand larceny. He had been on duty nights and had ordered loaded cars transferred to a track of the Lackawanna road where they were robbed. The court proceedings showed that on one occasion Vogel had been responsible for the theft of a carload of aluminum valued at \$26,000; and the total of the thefts involved is said to have been \$50,000. Two accomplices, having given evidence for the state, were let off with light punishments.

The last span of the new bridge over the Ohio river at Metropolis, Ill., was swung clear of the falsework on November 10. With the laying of track and other finishing touches it is expected that this bridge will be placed in operation about the first of January. This great structure, which is notable as containing the longest simple span (720 ft.) in the world, is being built jointly by the Chicago, Burlington & Quincy and the Nashville, Chattanooga & St. Louis. The completion of this bridge opens a new all-rail route for traffic from the Northwest to the Southeast.

Representative T. W. Sims, of Tennessee, who is a member of the Newlands Committee, and who is expected to be the next chairman of the House Committee on Interstate and Foreign Commerce, in a newspaper statement, expresses doubt as to whether it will be advisable at the coming session of Congress to attempt any permanent railway legislation of importance because of the abnormal conditions created by the war. He suggested, however, that it might be wise to pass legislation by which the Government would guarantee loans to the railroads at $3\frac{1}{2}$ to 4 per cent for short terms.

Striking clerks of the Atlantic Coast Line and the Southern Railway at Norfolk, Va., decided, on November 25, to return to work; and this action appears to be the sequel to an order from J. J. Forrester, president of a clerks' union which appears to have a considerable membership on all of the principal roads of Virginia, North Carolina and South Carolina. Fragmentary newspaper reports of strikes of clerks on the roads in that region have appeared for the last three weeks. The last reports indicate that on the Chesapeake & Ohio, the Norfolk Southern and the Virginia roads the striking clerks are still out.

The New York State Safety Congress is to be held in Syracuse on December 3, 4, 5 and 6 under the auspices of the New York State Industrial Commission. War problems as related to industry in general and New York State in particular will be chief features of the program. There will be addresses on the first day by Charles B. Barnes, Dr. Royal Meeker, Carlton A. Chase and James P. Holland. On Monday evening there will be given a motion picture showing the salutary effect upon industrial safety by educating the alien population. Tuesday there will be addresses by R. M. Little, James A. Smith, Arthur E. Holder and Miss Mary Dreier.

The United States Civil Service Commission announces examinations for inspector of waybills, for both men and women, to fill vacancies in the office of the chief of ordnance, war department, at salaries ranging from \$1,200 to \$1,500 a year. The duties of appointees will consist of the inspection of waybills, card manifests and railroad terminal records. Competitors will not be required to report for examination at any place, but will be rated: Education and preliminary experience, 30; experience in the class of work specified, 70. Until further notice and on account of the urgent needs of the service, applications will be received at any time, and papers will be rated promptly.

Food Administration and Railways Co-operate at Chicago

A far-reaching plan designed by the railroads and the Food Administration to conserve cars and foodstuffs went into effect in Chicago on November 26. Hereafter every railroad entering Chicago will make a daily report to the food administration of every car of vegetables and other perishable foodstuffs which has been delayed three days or over, awaiting unloading or re-consignment or other disposition. This report will show the car initial and number, point of shipment, date shipped, name of shipper, contents, date of arrival, yard or track where held, name of consignee, destination for delivery and why car is held.

In all cases reported by the railroads of undue detention of cars so loaded the Food Administration and other government agencies will first definitely fix the responsibility for the detention

creased 8.6 per cent; taxes increased 79.7 per cent. Operating income per mile decreased 1.7 per cent.

For the Western railways, operating revenues per mile exceeded those for September, 1916, by 6.0 per cent; operating expenses rose 17.1 per cent; net operating revenue decreased 9.4 per cent; taxes increased 120.0 per cent. Operating income per mile decreased 25.5 per cent.

The nine months of the current calendar year, compared with the corresponding period of the preceding year, show changes per mile of line as follows: Operating revenues increased 11.6 per cent, operating expenses increased 18.7 per cent, net operating revenue decreased 2.0 per cent, taxes increased 29.7 per cent, while operating income decreased 6.6 per cent.

Operating income per mile decreased 15.9 per cent in the East, increased 1.4 per cent in the South, and increased 0.6 per cent in the West.

September net operating income per mile was 17.8 per cent less in 1917 than in 1916, 9.5 per cent less than in 1915, 9.2 per cent greater than in 1914, and 8.1 per cent greater than in 1913.

Valuation Arguments December 10

The Interstate Commerce Commission has announced that oral arguments will be held at Washington on December 10 in the cases involving the reports of the Bureau of Valuation on the valuation of the Atlanta, Birmingham & Atlantic, the Texas Midland and the Winston-Salem Southbound.

Association of American Railway Accounting Officers

A circular just issued by the president of the Association of American Railway Accounting Officers says in part:

It is inevitable, especially under the extraordinary conditions now prevailing, that railway accounting officers will evolve new, improved, or simplified methods, forms, etc., and if we may have the benefit of each other's ideas and experience in this connection, this would aid in solving those problems and difficulties that are confronting us all.

The association will welcome and will be glad to consider any suggestions or any ideas, methods, forms, etc., that might be helpful to others. Any communications along this line, if addressed to the president, J. A. Taylor, comptroller of the Central of New Jersey, will be placed in proper channels.

Minimum Facilities

The Railroad Commission of a prominent western state, reporting recently on a complaint that the station facilities at a certain place were inadequate, gives the following description of the station as it was found:

"X is a non-agency station 6.3 miles north of A and 2.6 miles south of G, by rail, these being the nearest open stations. The station facilities consist of a box-car shelter divided into separate compartments for passengers and freight. The compartment designed for the use of passengers has a door and three small windows. It is equipped with a coal stove and seats for five persons. The freight room has two doors, and is conveniently arranged for loading freight into wagons. The door of the waiting room is in poor repair and the walls are disfigured. A farmer living about 40 rods from the station is employed to attend the fire in the station, and for this purpose he or his fourteen-year-old son visit the station twice daily from November 1 to April 15. A single compartment earth closet is provided.

The village is located about one-half mile east and there are no houses in the immediate vicinity of the station. The village contains a number of business places and has a population of between 50 and 100; but it was estimated that approximately 500 families are naturally tributary to this station. The wagon road to G, is in fair condition and is approximately four miles in length.

"Witnesses complained that the passenger waiting room is insufficient and not properly cared for. A number of instances were cited where it was not heated at train time and was in an unsanitary condition. As many as fifteen people occasionally wait for a single train. The trains are often late, especially in severe weather. The freight room doors are never locked and the merchandise is pilfered if it is not immediately removed by the consignee. A number of such occurrences were described. The team-way leading to the rear door of the freight room was

said to be too narrow for convenience. A conductor's count of passengers on and off trains from April 5 to May 4, 1917, shows an average of 4 passengers a day boarding trains and 5 passengers leaving trains at this point. The greatest number boarding any single train was 6. The total freight receipts during the calendar year 1916 were \$2,144, of which \$1,250 were for freight received and \$894 for freight forwarded."

The commission, in its decision, denied the need of a new station or the employment of a regular agent, but ordered certain improvements, including the employment of a competent caretaker—whether or not the farmer and his fourteen-year-old son would be acceptable does not appear—and the provision of two toilets.

Transportation and Car Accounting Officers

J. W. Nowers, president of the Association of Transportation and Car Accounting Officers, announces that, on account of the present international situation, the executive committee has postponed indefinitely the Winter meeting of the Association. A Year Book is being prepared, which will be issued December 31, containing a resume of the work accomplished by the committees in response to requests of the Commission on Car Service of the Special Committee on National Defense. This will be prepared in form similar to the regular proceedings.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Watten Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January 22-24, 1918, Hotel Sherman, Chicago.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Morrison Hotel, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CINCINNATI RAILWAY CLUB.—H. Boutet, Chief Interchange Inspector, Cincinnati, 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hilles, 568 Union Arcade Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.

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

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 59th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Geo. A. J. Hecherbe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PACIFIC RAILWAY CLUB.—V. S. Winters, Assistant to Chief Engineer, Northwestern Pacific R. R., San Francisco, Cal.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria, Ill.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial Annex Hotel, Pittsburgh.

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

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.

TRAFFIC CLUB OF CHICAGO.—C. R. Singer, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 201 Broadway, New York. Regular meetings, 1st, 3d, 5th, 7th, 9th, 11th, 13th, 15th, 17th, 19th, 21st, 23rd, 25th, 27th, 29th, except June, July and August, Waldorf-Astoria Hotel, New York.

WESTERN CANADA RAILWAY CLUB.—I. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1117 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

WESTERN SOCIETY OF ENGINEERS.—Edward S. Nethercut, Secretary, 1735 Monadnock Block, Chicago, Ill. Regular meeting, first Monday in month, except January, July and August. Extra meetings generally on other Monday evening except in July and August.

Traffic News

R. S. Lovett, director of priority in transportation, has issued Priority Order No. 4 providing for priority in car supply and transportation for cottonseed cake and cottonseed meal to points in Texas and New Mexico over all other traffic, with five exceptions.

The interurban railway companies of Texas have advanced their freight and express rates; and the State railroad commission has issued an order assuming jurisdiction over all these roads. The commission proposes to make a thorough investigation and has ordered the interurban companies to file all their passenger, freight and express tariffs.

The Ann Arbor announces that car ferry service from Kraftort, Mich., to Menominee, Mich., and Marinette, Wis., will be suspended for the season on January 1. While the route is closed freight for Menominee and Marinette will be carried via Manitowoc, Wis., and the Chicago & North Western or via Kewaunee, Wis., and the Kewaunee, Green Bay & Western and the Chicago, Milwaukee & St. Paul.

Representatives of electric lines in Illinois and Indiana met in Chicago on November 22 for the purpose of organizing to assist the steam roads in handling freight. The meeting resulted in the appointment of a committee to establish through routes and to work out rates to achieve this end. The committee consists of H. G. Faithorn, vice-president of the Chicago Lake Shore & South Bend; F. W. Shappert, traffic and industrial agent of the Chicago, North Shore & Milwaukee; Richard Breckenridge, general freight and passenger agent of the Aurora, Elgin & Chicago; J. R. Blackhall, general manager of the Chicago & Joliet, and F. E. Fisher, general superintendent of the Chicago, Ottawa & Peoria. Further meetings will be held and it is planned to organize all the electric lines in Wisconsin, Illinois, Indiana, Ohio and Michigan for freight traffic purposes. This step is not being taken with the idea of competing with the steam roads, but at the suggestion of the latter in order to assist in handling the unprecedented freight business now flooding the railroads of the country.

Hearing on Proposed Increase in Express Rates

The Interstate Commerce Commission has announced that it will take up the application of the 14 express companies for a general increase of 10 per cent in express rates at a hearing at Washington, December 7. On the same day as its announcement the Commission had given out its usual monthly bulletin of express earnings and expenses which showed for seven months of 1917 an increase in operating revenues of the principal express companies from \$54,400,330 to \$64,520,781, while the operating income, as the result of increased expenses and taxes, had fallen from \$5,161,428 to \$1,192,340.

Fertilizer Association Works for Heavier Loading

The soil improvement committee of the National Fertilizer Association, Chicago, Ill., has issued a pamphlet, entitled "Fertilizers in War Time," explaining how war conditions have increased the difficulty in securing fertilizers and how the commandeering of coastwise vessels by the government forced fertilizers to move almost exclusively over the already overburdened railroads. Special emphasis is placed on the importance of ordering spring fertilizers early and in full carloads.

The pamphlet will be given nation-wide distribution in connection with a campaign to be conducted by the fertilizer industry through the winter and spring months. The association's campaign, in advance of the spring and fall shipping seasons of 1917, is credited with having doubled the efficiency of the cars used for fertilizers and stopping a long-standing trade custom in many sections, i. e., minimum carloading. The work of the association will be supported by liberal advertisements in the farm papers and agricultural journals during December, January, February and March. In addition, the manufacturers themselves are bringing special pressure to bear on all dealers and buyers of fer-

tilizers to order their supplies early. A part of the pamphlet distributed by the association follows:

"The railway transportation situation remains as acute as at any time during the past year. Most of the phosphate rock from Florida to be used in the north must move through the Potomac gateway, which is now so congested as to make shipments most uncertain and erratic. Two million tons of phosphate rock must be moved by one means or another, if the normal demands are to be met. It is only by ordering *now* that the farmer can be assured of deliveries when he wants the goods.

"Order *now*, and order *full* carloads."

Million and a Half Soldiers Moved by Railroads

Figures compiled by the Railroads' War Board indicate that the railroads of this country have safely transported approximately 1,500,000 soldiers to training camps and embarkation points since August 1. One-third of these men have made journeys necessitating overnight travel and have been moved in tourist or standard sleepers.

On one of the long hauls 8,000 men were moved from a training camp on the western coast to a point on the eastern coast—a distance of 3,700 miles—in a little less than a week. The men traveled in 16 sections, each section comprising 12 tourist cars and 2 baggage cars.

In order to centralize the furnishing of sleeping cars and to utilize these cars to the best advantage, the Pullman Company changed the supervision of the supply and movement of these cars from the headquarters of the company at Chicago to Washington, where C. W. Henry, assistant to the superintendent of car service, was stationed. Mr. Henry, in his headquarters at the offices of the Railroads' War Board, has been in daily touch with the office of the quartermaster general, and on receipt of requests from military authorities for sleeping-car equipment has seen that the cars were rushed at once to the points needed.

As a result of this co-operation between the government, the railroads, and the Pullman Company, 500,000 soldiers have been spared the discomforts of making long trips in day coaches. To assure the safety of the men in transit, the railroads have adopted an average speed of 25 miles an hour for all troop trains except when freight cars are included in the trains. The speed is then reduced to 20 miles an hour.

Federal and State Commissioners at Boston

George W. Anderson, Interstate Commerce Commissioner, began in Boston last week a hearing on the applications of the principal New England roads for authority to make increases in rates; and with Mr. Anderson sat members or representatives of the Public Service Commissions of all of the New England states and of New York (second district). The railroads have presented petitions both to the Federal and to the State Commissions. Henry B. Endicott, of the Massachusetts Council of Defense, who has acted as arbitrator in matters of railroad employees' wages, appeared and spoke in favor of the proposed increase of 15 per cent in freight rates. R. O. Lamb, president of the John Hancock Life Insurance Company, speaking for investors, recommended the increase. His company has bought no railroad securities for more than a year. The president of the Boston Chamber of Commerce said that the Chamber was in favor of the increase. Professor W. J. Cunningham, of Harvard University, gave statistics showing the great decreases in net earnings of the railroads. Howard Elliott, of the New Haven road, and a member of the War Board, gave general information about increases in cost of operation and in taxes.

Frederick H. Prince, a railroad capitalist of long experience, presented an argument in favor of increasing the prices for carrying small shipments of freight. He reported an investigation which had been made on the Pere Marquette which showed that local freight in small lots was constantly carried at a loss. The most profitable local freight train on the Pere Marquette cost, to run, an average of \$81, daily, more than its earnings. The losses of that road on that class of freight would amount to approximately fifty times this sum, that being the number of regular local freight trains. This would amount to \$1,500,000 annually. Mr. Prince said that of the freight traffic of the Boston & Maine, 37 per cent was of this unprofitable character. He would have all the railroads make a special charge for loading and unloading freight, with a minimum charge per package.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The Interstate Commerce Commission on November 23 issued an order discontinuing the investigation ordered some time ago in the matter of embargoes.

In the case of Pollak Steel Company of Cincinnati versus Baltimore & Ohio et al., Attorney-Examiner Charles F. Gerry has recommended that the commission require the railroads to remove a discrimination on iron and steel articles from Cincinnati and Chicago to Atlantic ports. He finds an undue preference for Pittsburgh, Cleveland and other points. Rates from Pittsburgh are about 37.5 per cent of the Chicago-New York scale, while a strict adherence to mileage would make them 60 per cent. Cincinnati's rates are strictly on the percentage basis, 87 per cent of the Chicago rates.

Minor Tariff Changes Authorized by Blanket Order

Division 2 of the Interstate Commerce Commission, consisting of Commissioners Clark, Daniels and Woolley, has taken action to enable the railroads to make changes in tariff publications which are in the nature of notices of changes in lists of stations, etc., and in physical facilities for the information of shippers and other carriers, rather than changes in rates, without the necessity of securing the approval of the commission under the fifteenth section of the act, as is required in the case of tariffs containing an increased rate. Fifteenth Section Order No. 125 was issued on November 20, which says:

"Changes in facilities for the physical handling of freight or express matter at stations or express offices throughout the country, such as the addition of or abandonment thereof on old lines, the installation or removal of facilities for handling c. l. or l. c. l. freight, the opening and closing of 'Summer' stations, instructions to agents concerning the waybilling of shipments, and changes in the list of restricted and prohibited commodities published by water and rail carriers, are of almost daily occurrence.

The shipping public and the carriers should be informed of such physical changes and restrictions as promptly as possible to the end that both shippers and carriers may be spared the inconvenience or actual loss which may be caused by delay to freight or express matter resulting from shipments being billed and forwarded upon improper and inaccurate information respecting facilities at destination points and the detention of shipment or cars at interchange points or at ports awaiting amended instructions from shipper or agent at point of origin."

Therefore, the carriers were authorized, to make changes in their tariffs, provided a notation referring to the order is placed on the title page, in such provisions as the following:

1. Additions of stations, landings or express offices on old lines.
2. Cancellation or withdrawal of stations, landings or express offices on old or abandoned lines.
3. Withdrawal or elimination of facilities for handling carload freight or express matter.
4. Withdrawal or elimination of facilities for handling l.c.l. freight or express matter.
5. Withdrawal or elimination of facilities for handling live stock.
6. Withdrawal or elimination of all facilities for handling freight or express matter.
7. Opening and closing of stations, landings or express offices at which business is transacted only during certain seasons of the year.
8. Provisions restricting the handling of inbound or outbound freight or express matter.
9. Provisions restricting the delivery of freight or express matter on private sidings.
10. Provisions restricting the handling of traffic interchanged with connections.
11. Designation of stations as junction points, passenger stations, passing tracks, or towers, at which no freight or express matter will be handled.
12. Limitations upon the quantity, weight or dimensions of shipments that can be handled at a specified station, landing or express office.
13. Limitations upon the handling of specified commodities at a station, landing or express office.
14. Waybilling instructions.
15. Additions to and eliminations from water carriers' lists of restricted and prohibited commodities shown in tariffs of the water carriers and joint tariffs of rail and water carriers.

Free Time at Ports Reduced

The Interstate Commerce Commission on Monday issued its decisions in the export freight free time and New York Harbor storage and free time cases. The commission finds the reduction proposed by the railroads from 5 days to 2 days in the free time allowed for holding at terminals at the Port of New York, domestic freight consigned to New York lighterage points, justified. Proposed increases in storage charges applicable on both export and domestic shipments were also found to be reasonable. In the export freight case the commission finds that the roads have failed to justify the proposed reduction from 15 to 5 days in the free time allowed on export traffic at the North Atlantic ports and from 10 to 5 days at the Gulf ports. The schedules under suspension, therefore, are required to be cancelled without prejudice to the filing of new schedules providing for not less than 10 days free time at the North Atlantic ports and not less than 7 days at the Gulf ports, which periods are found to be reasonable under existing conditions. The proposed reduction from 10 to 5 days in the free time applicable to bunker coal at the ports of New Orleans, Mobile and Pensacola are found to have been justified.

The report says that the only objectors to a reduction of the free storage time at New York were the flour dealers; and it adds:

"The New York flour dealers may not properly demand a total free time of seven days on their shipments when dealers at other ports have but two days; nor is it an adequate answer to this statement to say that the conditions at the port of New York are unusual. However unusual they may be, it would clearly be unjust to the carriers to rule that it is incumbent upon them to hold flour on their valuable piers for five days without charge, solely because the flour dealers find it convenient to use the carriers' facilities for storage purposes. The extent to which the flour merchants would use the terminal facilities for storage, if permitted to do so, is indicated by their contention that in addition to a reasonable period of free time they should be allowed to store domestic flour on the piers for thirty days and export flour for sixty days, at reasonable rates, as distinguished from penalty charges. There is merit in the railroads' contention that some remedy must be found for a condition that entails the holding on piers of 36.8 per cent of total flour shipments on hand (on piers) on typical days in October, 1916, for longer than thirty days."

STATE COMMISSIONS

The New York Public Service Commission, First District, has ordered the reduction of the rates chargeable by the Westcott Express Company, New York City, for taxicab service from railroad terminals to hotels, steamship piers, etc., and vice versa, to the level of the rates charged for taxicab service under city licenses. The Westcott Express Company has accepted the order of the commission and put the reduced rates into effect.

The Railroad Commissioners of Louisiana, on November 22, imposed a fine of \$5,000 on the Texas & Pacific and the receivers in charge of the road, for an "arbitrary, wilful, deliberate and flagrant" violation of the rule of the commission which forbids the discontinuance of a passenger train without the consent of the commission. It was further ordered that the fine shall be increased by \$5,000 for every day that the violation of the rule continues. It appears that the receivers had taken off nine branch line passenger trains in order to conserve the coal supply, and to insure the regular movement of freight traffic, especially sugar. On the following day, on application of the receivers, the Federal Court issued a temporary injunction restraining the commissioners from interfering with the operation of the road.

COURT NEWS

Weeds on Right of Way—Safe Place to Work

A section hand, while placing a hand car on the rails had his limbs pricked with burs and thistles, causing blood poisoning, for which he sued the company, alleging that it had failed to furnish a reasonably safe place to work. The Iowa Supreme Court holds that the presence of noxious weeds on a right of way is not a breach of the railroad's duty to furnish a safe place

to work to section hands whose duties involve the care and maintenance of the right of way, though an Iowa statute requires the railroads to destroy such weeds or pay the expense of their destruction by the public authorities.—*McCutcheon v. Chicago, M. & St. P. (Iowa)*, 164 N. W., 774. Decided October 27, 1917.

Liability for Injury to Pullman Employees

The Federal District Court for the Southern District of Florida holds that the validity of a contract made in Florida by a Pullman company employee, exempting any railroad company over whose line he might run from liability on account of any personal injury to him, when brought in question in an action in a Federal Court in Florida, is to be determined by the law of that state, although the injury sued for happened in another state. The Florida statute, providing that a railroad company shall be liable for any damage done to persons by the running of its trains, or by its employees, unless absence of negligence is shown, does not declare a public policy of the state, which renders void such a contract provision, and in the absence of statute, or a decision of the Supreme Court of the state establishing such a public policy, such a contract is valid.—*Eulbanks v. Southern*, 244 Fed., 891. Decided August 21, 1917.

Hours of Service Decisions—Diligence Alter Unforeseen Delay—Switch Tenders Receiving Telephone Orders

In an action for violating the Hours of Service Act by keeping train employees on duty for more than 16 hours it appeared that the crew of five men in charge of a freight train running from Blue Island to Chicago and return, a distance of 63 miles, was in continuous service for a period varying from 17 hours 5 minutes to 17 hours 35 minutes. In justification the railroad showed that, because of a derailment of a car in a train ahead, there was a delay of 2 hours and 20 minutes. The railroad contended, first, that delay of such origin comes within the exception of section 3 of the act, and the maximum period of 16 hours was thereby automatically extended 2 hours and 20 minutes. This contention the Circuit Court of Appeals, Seventh Circuit, rejected on the authority of prior decisions. It held that the railroad was required to show, in addition to the cause of delay, that it exercised a high degree of diligence to overcome the effect of the delay and relieve its employees from continuous service over 16 hours. "It was admitted on the trial that no effort was made by the train dispatcher or any other representative of the railroad to relieve the crew after knowing of the accident and resulting delay. The train dispatcher labored under the impression that the 16-hour limit was extended for a period of 2 hours and 20 minutes, due to excusable delay, and that no violation of the law would occur until the crew had been in continuous service for 18 hours and 20 minutes, and such misapprehension of the law explains, at least in part, the failure of the carrier to take any steps to relieve the crew." It was held that this evidence supported the finding of the trial judge that the railroad had violated the statute.—*Indiana Harbor Belt Ry. Co. v. United States*, 244 Fed., 943. Decided July 24, 1917.

The Circuit Court of Appeals, Seventh Circuit, holds that switch tenders, who regularly conduct the movements of the trains in and through a yard, receiving the yardmaster's telephone orders in their shanties, and executing them by transmitting them verbally or by signal to the engine or train men, and by manipulating switches, are within the proviso of Hours of Service Act, Section 2, limiting to nine hours the service of an employee who by use of the telephone receives orders pertaining to or affecting train movements.—*Chicago & Alton v. United States*, 244 Fed., 945. Decided July 12, 1917.

UNITED STATES SUPREME COURT

The case of the appeal of the Reading Company et al, from the decision of the lower court in the government's suit against them under the Sherman anti-trust law was reargued in the United States Supreme Court on November 20 and 21. Arguments were made by G. C. Todd, assistant to the attorney general, for the United States; by Jackson E. Reynolds for the Reading Company and by R. W. DeForrest for the Central of New Jersey.

Equipment and Supplies

LOCOMOTIVES

THE ST. PAUL UNION DEPOT COMPANY has ordered one six-wheel switching locomotive from the Lima Locomotive Works.

THE ILLINOIS CENTRAL has ordered 50 Mikado locomotives from the Lima Locomotive Works, Inc., and 25 switching locomotives from the American Locomotive Company.

FREIGHT CARS

THE UNITED STATES WAR DEPARTMENT, Equipment Division, is inquiring for prices on 78 50-ton flat cars.

THE ZIMMERMAN ALDERSON CARR COMMERCIAL COMPANY is inquiring for prices on 25 8,000-gal. capacity tank cars.

THE AMERICAN INTERNATIONAL STEEL CORPORATION, New York, has issued inquiries for 300 4,000-gal. tank cars and 80 mine cars for export to industrial interests.

THE UNITED STATES NAVY has ordered 4 50-ton box cars from the American Car & Foundry Company for the Great Lakes Naval Training Station and has issued an inquiry for 10 40-ton box cars for the Bureau of Docks and 16 40-ton gondola cars.

THE UNION PACIFIC has placed orders for 3,350 freight cars as follows: 1,000 stock cars, American Car & Foundry Company; 1,000 hopper bottom coal cars; 50 caboose cars, Mount Vernon Car Manufacturing Company, and 500 flat and 1,000 drop bottom gondola cars, Bettendorf Company.

PENNSYLVANIA HOLDS FAST TRAIN FOR SICK WATCHMAN.—The Pennsylvania Railroad company showed the human side of the big corporation one morning recently when it held up one of its through passenger trains running as an extra with first class privileges for half an hour to get a doctor on board who would carry relief to a lone watchman in a little box six miles west of Lewistown Junction, Pa., suffering from an acute attack of cramps. After the doctor had administered first aid to the sick watchman, both were brought to a local hospital in the caboose of a freight train.

ITALIAN RAILWAYS IN HANDS OF ENEMY.—Press despatches, dated November 9, report that the Austro-German armies are in possession of more than sixty miles of Italian railroads, controlling more than thirty miles of the line from Grado, on the Adriatic, toward Venice, and about an equal amount of the trackage of railroad in the north, with Udine as its center. Control of these facilities, together with a large part of the extensive system of canals in Northeastern Italy, supply the enemy with advantageous means of communication, of which the invaders already are making use.

THE CONSTITUTIONAL RAILWAYS OF MEXICO are gradually restoring their regular train service, says a correspondent, to divisions that have been out of commission during most of the protracted revolutionary period. It is announced that passenger and freight trains are now being operated between Torreon and Durango and upon several short branch lines that have been unused for a long time. The new railroad that connects the City of Durango with the division of the Constitutionalist Railways at a point near Zacatecas is finished and will be placed in regular operation as soon as it can be equipped with the necessary rolling stock. The railroad that runs between Saltillo and Torreon, formerly known as the Coahuila & Pacific, now a part of the Constitutionalist Railways, is again performing a regular freight and passenger service between those two cities. Bands of brigands are still operating along the line of the railroad that connects San Luis Potosi with Tampico, and occasional attacks are made upon trains between Saltillo and Catorce. The government, however, seems to be gradually gaining the upper hand over these outlaws and travel is becoming safer all the time.

Supply Trade News

Allen R. Miller, of the B. F. Goodrich Company, railroad sales department, at Akron, Ohio, has been transferred to the B. F. Goodrich Rubber Company, 1780 Broadway, New York, as eastern representative.

J. W. White has been appointed manager of the power and railway division of the Detroit office of the Westinghouse Electric & Manufacturing Company. Mr. White was formerly connected with the Pittsburgh office of the company, subsequently becoming associated with the Allis Chalmers Company, and has now returned to the Westinghouse Company, assuming the position above noted.

L. F. Hamilton, manager of the advertising and specialty department of the National Tube Company, Pittsburgh, Pa., will, on December 1, become associated with the Walworth Manufacturing Company, Boston, Mass., and will be succeeded by W. L. Schaeffer, his assistant. The Walworth Manufacturing Company recently purchased the Kewanee works and the Kewanee line of products from the National Tube Company. Mr. Hamilton will take up approximately the same duties with the company that he had with the National Tube Company, more particularly the training of specialty students, the supervision of specialty and sales promotion work, etc.

Fuel Orders for Lehigh Valley and the C. & O.

Orders intended to insure an adequate supply of coal to the Lehigh Valley and the Chesapeake & Ohio have been issued by the United States Fuel Administration. The orders will distribute equitably among the mines adjacent to the roads the burden of furnishing the roads' fuel supply. Both orders took effect on November 19. Mines now under contract to supply the railroads with coal will be required to supply their quota at their contract prices. Other mines will be required to furnish a pro rata supply, and at prices fixed by the government. The railroads will be required to file with the Fuel Administration each week a schedule of the tonnage which must be requisitioned for the next week's supply. The requisition order will be given priority over all contracts for other parties. The Lehigh Valley draws its supply from mines which are not located on its own lines. These mines are ordered to give priority to the demands of the Lehigh Valley, even over requisitions for coal to supply the railroads upon which they are located.

On Monday of this week, similar orders were issued in favor of the New York, New Haven & Hartford and the Central New England. The order directs all mines under contract with these railroads to give preference to the contract requirements over other shipments, except where coal is diverted by direct requisition of the Fuel Administration.

HYDRO-ELECTRIC STATION OF ITALIAN STATE RAILWAYS.—Permission has recently been granted to the Italian State Railways by the Ministry of Public Works for the erection of a hydro-electric station at Bardonecchia (Susa), a town in the Cottian Alps, 5 miles from the French frontier on the Modane line. The cost of this plant will be about 20,000,000 lire (approximately \$4,000,000).—*Commerce Report.*

CAPTURED ZEP UP 8 MILES.—A staff correspondent of the Philadelphia Evening Ledger sent a despatch, dated October 23, from American Field Headquarters in France describing the Zeppelin L-49, brought down near Bourbome-les-Bains. It says it is 600 feet long, with a diameter of 90 feet, has an aluminum frame, with longitudinal and horizontal ribs, covered with stout interlaced cord, over which is the outside cover of linen, painted black. The shape is that of an exaggerated fat cigar. Two silk balloons fill the interior, holding the hydrogen gas, which gives the lifting power. Slatted runways, nine inches wide, with guide rails, extend the length of the airship, giving access to sleeping quarters, an electric kitchen, and the five great steel engines. The Zeppelin's instrument for calculating altitude, says the correspondent, showed she had ascended a distance of 42,000 feet.

Railway Financial News

CANADIAN NORTHERN.—The Wall Street Journal says that the Canadian government has decreed that the most that shall be paid by arbitration for the 600,000 shares of common stock of the Canadian Northern shall be \$10,000,000. The road is now in its final stage of transfer to the government of Canada, which for the past year has owned 400,000 shares of the company's stock, taken as collateral for loans. Arbitration proceedings will commence at once and must be concluded by March 1, 1918.

The par value of the 600,000 shares at present held by the Canadian Northern is \$60,000,000, and Sir William Mackenzie, president of the road, says that the par value is not a penny above actual worth. However, the new government order marks down the stock at about 16 cents on the dollar. Nothing prohibits the arbitrators from placing a valuation higher than the arbitrary maximum of ten millions, but nothing more than that may be paid from the public treasury.

If the value is found to be less than \$10,000,000, then the less sum will be paid. It is understood that Mackenzie, Mann & Company, Limited, own approximately five-sixths of these shares. Consequently, the maximum that can be paid to them will be something over \$8,000,000. These shares are pledged to their bankers as part security for loans, which presumably constitute a claim against the property.

The duty of the arbitrators is to take evidence such as may be offered on behalf of the Dominion and of the company. Both parties will be heard in the usual way.

The agreement does not call upon the arbitrators to adopt any particular method. They may inquire what the stock could be sold for; they may ascertain the value of the assets and deduct the liabilities. They may take into consideration earning power. They are not restrained in any way, but simply required to get at the fair value in the best way possible. It is further specifically provided that if the arbitrators should see fit to take into consideration the reproduction cost of the system, then they must not include therein the increase in value, due to the war, of labor, material, equipment, or of any property whatever.

The company will be required to disclose all liabilities of every kind to the arbitrators. Should it be found later that liabilities exist that were not disclosed, or in excess of those disclosed, then a corresponding deduction will be made from any award given.

DENVER, BOULDER & WESTERN.—This company, which operates 49 miles of line between Denver, Colo., and Boulder, has notified the Colorado Public Utilities Commission that commencing with December 27, it intends to abandon operations, dismantle and sell its equipment.

ERIE.—Although this company recently received authority from the New Jersey Public Utilities Commission to issue \$15,000,000 20-year 6 per cent refunding and improvement bonds, series A, it is stated authoritatively that no public financing is contemplated at this time. It is understood, however, that the company may borrow some money privately and use the new bonds as collateral to secure the loan.

LAKE ERIE & EASTERN.—The Ohio Public Utilities Commission has authorized the issuance of \$7,750,000 common stock to sell at not less than par. The proceeds will be used in paying indebtedness to its controlling companies, the Pittsburgh & Lake Erie and the Mahoning Coal Railroad Company, amounting to \$6,687,415 for equipment and the construction of its line; also to pay for additions and improvements estimated to cost \$1,102,584.

SWISS TRANSPORTATION DIFFICULTIES.—Stage coaches may be seen again running between towns in Switzerland, according to press despatches. Owing to the ever-decreasing amount of coal arriving from Germany the Swiss Government has been forced to suppress half the number of passenger trains in Switzerland, while those trains in service will not be heated.

Railway Officers

Executive, Financial, Legal and Accounting

L. J. Masson has been appointed auditor of the San Diego & Arizona and the Tijuana & Tecate, with office at San Diego, Cal., vice H. I. Kittlesby, resigned to accept service elsewhere.

L. O. Heintz has been appointed auditor of freight and passenger accounts of the Missouri & North Arkansas and John P. Doughty has been appointed auditor of disbursements, both with headquarters at Harrison, Ark.

George J. Adams, who has been appointed assistant to vice-president in charge of accounting, of the Pennsylvania Railroad, with office at Philadelphia, Pa., as has been announced in these columns, was born on November 22, 1881, at Philadelphia. He was educated in the public schools and in Pierce's Business College of his native town. On April 1, 1897, he entered the service of the Pennsylvania Railroad as a clerk in the secretary's department. He was transferred in January, 1899, to the treasury department, where he served until August, 1900, when he returned to the secretary's department. In June, 1906, he served in the office of Samuel Rea, then vice-president, and in December, 1910, Mr. Adams was appointed chief clerk. He later was chief clerk to A. J. County, then special assistant to the president, who later became vice-president in charge of accounting. On November 1, 1917, Mr. Adams was appointed assistant to vice-president in charge of accounting of the same road, as above noted.



G. J. Adams

R. F. Watkins, whose appointment as treasurer of the Denver & Rio Grande was mentioned in these columns on November 9, was born at Davenport, Iowa, on October 13, 1870. Mr. Watkins received his education in the public schools of Davenport and the State University of Iowa at Iowa City. He entered railway service on February 26, 1894, in the office of the auditor of the Union Pacific, Denver & Gulf, afterwards the Colorado & Southern, and was chief clerk to the general auditor when he left that company on September 11, 1903, to become assistant secretary and trust officer of the International Trust Company, Denver, Colo. On January 1, 1906, he left the trust company to become assistant treasurer of the Denver & Rio Grande, and, after the death of the treasurer, J. W. Gilluly, was promoted to that position on August 19, 1913, resigning in 1915. He was again elected to the same position on November 1, 1917.

Operating

H. F. Sutherland has been appointed superintendent of the Kentucky & Indiana Terminal Railroad Company, with office at Louisville, Ky.

J. A. Shepherd has been appointed assistant superintendent of the Green River division of the Denver & Rio Grande, with office at Helper, Utah, vice T. F. Durkin, transferred.

P. J. Welsh has been appointed night trainmaster of the Kentucky & Indiana Terminal Railroad, with office at Louisville, Ky., vice F. I. Loyd, who has been assigned to other duties.

W. J. Haylow, assistant superintendent of transportation of the Louisville & Nashville at Louisville, Ky., has been appointed superintendent of transportation, vice C. B. Phelps, who has been called to Washington to serve as a member of the American

Railway Association's Commission on Car Service. T. B. Turner, assistant superintendent at Mobile, Ala., has been appointed assistant superintendent of transportation.

R. M. MacMillan has been appointed acting division superintendent of telegraphs of the Grand Trunk Pacific lines in Ontario, Manitoba and Saskatchewan, with office at Winnipeg, Man., vice F. T. Caldwell, granted extended leave of absence to enter military service.

H. L. Reed, superintendent of the Chicago, Rock Island & Pacific at Herrington, Kan., has been promoted to acting assistant general manager, second district, with headquarters at El Reno, Okla., succeeding G. W. Rourke, granted indefinite leave of absence on account of ill health; H. F. Reddig, division superintendent at El Reno, succeeds Mr. Reed; C. B. Pratt, terminal superintendent at Chicago, succeeds Mr. Reddig, and C. T. Ames, chief clerk to vice-president, succeeds Mr. Pratt, effective December 1.

James M. Scott, whose appointment as general superintendent, West Virginia district of the Baltimore & Ohio, with office at Wheeling, W. Va., has already been announced, was born on November 1, 1871, at Charleston, W. Va., and was educated in the high schools. He began railway work on September 10, 1890, with the Chesapeake & Ohio as telegraph operator and subsequently served on the Cincinnati, Hamilton & Dayton as operator; in November, 1895, was appointed despatcher, and subsequently served as trainmaster until November, 1904, when he was appointed superintendent. He remained in that position until May, 1910, and then went to the Kansas City Southern as trainmaster at Mena, Ark. The following January he entered the service of the Public Service Commission of Indiana in charge of the inspection department, and in September, 1912, went to the Baltimore & Ohio as supervisor of transportation. On January 1, 1913, he was appointed assistant superintendent of the Cumberland division and the following May became superintendent of the Monongah division, with headquarters at Grafton, W. Va., which position he held until his recent appointment as general superintendent, West Virginia district, of the same road, with headquarters at Wheeling, as above noted.



J. M. Scott

M. C. Selden, trainmaster of the Chesapeake & Ohio at Richmond, Va., has been appointed assistant superintendent, Newport News Terminal division, with headquarters at Newport News, Va.; P. P. Crawford, chief train despatcher at Richmond, has been appointed trainmaster of the Rivanna district, with headquarters at Richmond, vice Mr. Selden, and during the absence of C. S. Wright, trainmaster at Richmond, Mr. Crawford's jurisdiction is extended over the Peninsula district; E. W. Lacy has been appointed chief train despatcher of the Richmond division, with headquarters at Richmond, vice Mr. Crawford.

G. A. Hoag, who has been appointed superintendent of the Canadian Northern, eastern lines, with headquarters at Hornepayne, Ont., as has already been announced in these columns, was born on May 31, 1866, at Walters Falls. He began railway work on June 8, 1884, with the Grand Trunk and served as switchman until May, 1886. He subsequently served as night operator until January, 1888, and then as day operator and agent at different places until August, 1901, when he was appointed yardmaster at Belleville. He remained in that position until March, 1903, when he became agent at Trenton, and in October, 1905, resigned from the Grand Trunk service. He later served as trainmaster on the Central Ontario until 1908, and then to July, 1914, was superintendent on the same road. He subsequently became assistant

superintendent of the Canadian Northern at Trenton, Ont., which position he held at the time of his recent appointment as superintendent of the same road, as above noted.

F. E. Blaser, whose appointment as assistant general manager of the Baltimore & Ohio, with headquarters at Baltimore, Md., has already been announced in these columns, was born on

December 14, 1858, at Tomah, Wis., and was educated in the common schools. He began railway work in 1871, with the Western Wisconsin Railway, now a part of the Chicago, St. Paul, Minneapolis & Omaha, and served consecutively with that road as water carrier, telegraph operator, agent, brakeman, conductor, train despatcher and trainmaster. In 1900 he was appointed superintendent of the Ohio River Railroad and remained in the same position when that road was taken over by the Baltimore & Ohio. He then served as superintendent of the

Wheeling division of the Baltimore & Ohio and later was transferred as superintendent to the Cumberland division. In April, 1910, he was promoted to general superintendent at Baltimore, Md., which position he held at the time of his recent appointment as assistant general manager of the same road, as above noted.

William B. McCaleb, who has been appointed general superintendent of water companies of the Pennsylvania Railroad, with headquarters at Philadelphia, Pa., as has already been announced

in these columns, was born on May 18, 1862, at Mount Pleasant, Westmoreland county, Pa., and was educated in the public schools and at the Mount Pleasant Institute. He entered the service of the Pennsylvania Railroad in March, 1880, as chairman with an engineer corps at Connellsville, Pa. He subsequently was transferred to the assistant engineer's office on the Pittsburgh division as rodman, and later to the principal assistant engineer's office at Altoona. In April, 1883, he was appointed assistant supervisor at New Flor-

ence on the Pittsburgh division, and subsequently served in the same capacity at Harrisburg and at Greensburg. He was promoted in October, 1886, to supervisor of the Tyrone division, and a few months later was transferred to Middletown in the same capacity. In May, 1889, he was transferred to Downingtown as supervisor and the following December he was promoted to assistant engineer of the West Pennsylvania division at Allegheny City. He subsequently served in the same capacity on the Middle division at Harrisburg, and in October, 1895, was promoted to superintendent of the Bedford division. On December 10, 1896, he was made superintendent of the Sunbury and Shamokin division; in May, 1902, he was promoted to superintendent of the Middle division, at Harrisburg and upon a transfer of headquarters was made superintendent of the Philadelphia division in June, 1903, remaining at Harrisburg, and now becomes general superintendent of the Pennsylvania Railroad water companies, as above noted.



F. E. Blaser



W. B. McCaleb

J. W. Deneen, whose appointment as superintendent of the Monongah division of the Baltimore & Ohio, with headquarters at Grafton, W. Va., has already been announced in these columns, was born on July 8, 1875, at Cumberland, Md., and was educated in High School. He began railroad work in July, 1890, as a messenger on the Baltimore & Ohio; the following year he became an operator on the Cumberland division. From 1902 to 1915 he served consecutively as copy operator, train despatcher, chief despatcher and trainmaster. He was then appointed assistant superintendent, which position he held until his recent appointment as superintendent of the Monongah division of the same road, as above noted.

W. N. Neff, whose appointment as general manager of the St. Louis Southwestern and vice-president and general manager of the St. Louis Southwestern of Texas, with office at Tyler, Tex.,

was announced in these columns on November 10, was born at Lawrence, Kan., on August 11, 1874. His railway career started with the Missouri Pacific in June, 1889, and he remained with that road until September, 1895, serving as station baggageman, telegraph operator, station agent, roadmaster's clerk and clerk to the division superintendent. From September, 1895, to April, 1899, he was employed by the Montana Central and Great Northern, on the former as telegraph operator and maintenance of way clerk and on the latter as maintenance of way clerk, chief clerk to the superintendent and chief clerk to the general superintendent. In April, 1899, he went with the St. Louis Southwestern as assistant superintendent and in March, 1900, was promoted to superintendent, in which capacity he served until May, 1911, with the exception of one year when he was chief clerk to the president. From this date until January 1, 1915, he was general superintendent of the St. Louis Southwestern and vice-president and general superintendent of the St. Louis Southwestern of Texas. From January, 1915, to November 1, 1917, he was superintendent of the Northwestern Pacific at Sausalito, Cal. His appointment, as stated above, was effective November 8, 1917.



W. N. Neff

Traffic

H. W. Warren, city ticket agent of the Chicago, Milwaukee & St. Paul at Des Moines, Iowa, has been appointed to the recently created position of district passenger agent, with the same headquarters.

P. B. Doddridge, commercial agent of the Texas & Pacific at Kansas City, Mo., has been transferred to Pittsburgh, Pa., succeeding T. B. Moss, resigned. C. R. Krause succeeds Mr. Doddridge as commercial agent at Kansas City.

Paul Wadsworth, freight traffic manager of the Delaware & Hudson at Albany, N. Y., has been appointed assistant to the general traffic manager with duties to be assigned, and his former position has been abolished; Charles E. Rolfe, general freight agent at Albany, has been appointed general agent, traffic department, in charge of freight solicitation; William G. Story has been appointed general freight agent, and Walter C. Harden has been appointed assistant general passenger agent; all with offices at Albany.

Harvey Lewis Fell, who has been appointed assistant general passenger agent of the Central of Georgia with headquarters at Savannah, Ga., as has already been announced in these columns, was born on November 15, 1872, at Talbotton, Ga., and was educated in the public and commercial schools. He began railway work in October, 1892, with the Central of Georgia and has been in the continuous service of that road ever since. He first served in the passenger department as stenographer to the general passenger agent, and subsequently held positions in the same depart-

ment as voucher clerk, ticket stock clerk, rate clerk, chief rate clerk and chief clerk. On November 1, 1917, he was appointed assistant general passenger agent of the same road, as above noted.

E. H. Hoops, general agent in the freight department of the Chicago & North Western at Chicago, has been promoted to assistant general freight agent, with the same headquarters. A. R. Gould, general agent at Cleveland, Ohio, has been promoted to general agent in the freight department at Chicago, succeeding Mr. Hoops. A. W. Bower, general agent at Indianapolis, Ind., has been transferred to Cleveland to succeed Mr. Gould. John Mellen, general agent at Omaha, Neb., has been transferred to Indianapolis to succeed Mr. Bower and R. D. Miller, assistant general agent at Omaha, has been promoted to general agent, succeeding Mr. Mellen.

Walter S. Franklin, Jr., whose appointment as assistant general freight agent of the Pennsylvania Railroad, with headquarters at Philadelphia, Pa., has already been announced in these columns, was born on May 24, 1884, at Ashland, Baltimore county, Md. He graduated in 1906 from Harvard College with the degree of bachelor of arts, and in October of the same year entered the service of the Pennsylvania Railroad as platform clerk at Dock street freight station, Philadelphia. The following January he was made overcharge claim clerk in the general office, and in October of the same year was promoted to rate clerk. In October, 1908, he was transferred to the transportation department of the Northern Central Railway at York, Pa., as assistant to the agent. The following July he was appointed freight solicitor at Baltimore, and subsequently held the same positions in New Haven, Conn.; Toronto, Ont., and Pittsburgh, Pa. On January 1, 1914, he was appointed southern freight agent at Atlanta, Ga., with general supervision over the soliciting agencies of the Pennsylvania System in the southern states, and in December, 1915, was made division freight agent of the Philadelphia, Baltimore & Washington, at Baltimore, Md., which position he held until his recent appointment as assistant general freight agent of the Pennsylvania Railroad, lines east of Pittsburgh, as above noted.



W. S. Franklin, Jr.

Thomas Henry Gurney, who has been appointed assistant general passenger agent of the Chesapeake & Ohio, with headquarters at Cincinnati, Ohio, as has already been announced in these columns, was born on February 3, 1875, at Covington, Ky., and was educated in the high school. He began railway work in December, 1893, and served as a clerk and stenographer in the general passenger department of the Cleveland, Cincinnati, Chicago & St. Louis until August, 1895. He was then to August, 1903, consecutively stenographer and clerk, chief division clerk, and chief rate clerk in the general passenger department of the Cincinnati, Hamilton & Dayton at Cincinnati. From August, 1903, to the fall of 1904, he was chief clerk to the general passenger agent of the Chicago, Cincinnati & Louisville. In January, 1906, he was appointed general passenger agent of the same road, which later became part of the Chesapeake & Ohio, and from August, 1910, he was district passenger agent of the Chesapeake & Ohio lines until his recent appointment as assistant general passenger agent, as above noted.

Engineering and Rolling Stock

C. E. Peck, general foreman for the Southern Pacific at Roseville, Cal., has been promoted to master mechanic of the Portland division, with headquarters at Portland, Ore., succeeding George Wild, resigned.

A. C. MacKenzie, engineer maintenance of way of the Canadian Pacific, with headquarters at Montreal, Que., has been transferred in the same capacity to Winnipeg, Man., succeeding Frank Lee, transferred to Montreal in place of Mr. MacKenzie.

D. G. Cunningham has been appointed assistant superintendent motive power and car departments of the Denver & Rio Grande, with headquarters at Salt Lake, Utah; E. J. Harris having resigned, the duties of master mechanic will be also assumed by Mr. Cunningham.

William H. Fetner, acting superintendent motive power of the Central of Georgia at Savannah, Ga., has been appointed superintendent of motive power; Frederick F. Gaines, superintendent of motive power, who was granted leave of absence in September on account of continued ill health, has been assigned to other duties.

L. L. Allen, general foreman of the St. Louis, Brownsville & Mexico at Kingsville, Texas, has been appointed master mechanic of the Gulf Coast Lines, with headquarters at De Quincy, La., and J. L. Lavalie, master mechanic of the New Orleans, Texas & Mexico at De Quincy, has been appointed assistant superintendent with office at De Quincy.

Purchasing

R. L. Agner has been appointed division storekeeper of the Southern Railway, with office at Alexandria, Va., vice A. B. Lackey, resigned to enter service of United States Army.

E. J. Shields has been appointed general storekeeper of the Kansas City, Mexico & Orient, with headquarters at West Wichita, Kan., vice C. A. Keller resigned to accept service with the United States Government.

W. W. Eldridge has been appointed storekeeper of the Chicago, Burlington & Quincy at Sheridan, Wyo., succeeding M. Josselyn, assigned to other duties. I. G. Morrison, store inspector, succeeds Mr. Eldridge as storekeeper at Havelock, Neb.

Railway Officers in Military Service

F. T. Caldwell, superintendent of telegraphs of the Grand Trunk Pacific at Winnipeg, Man., has been granted an extended leave of absence to enter military service.

C. V. Link, was erroneously reported as being appointed assistant superintendent of the Chicago, Terre Haute & South-eastern at Bedford, Ind., in the *Railway Age Gazette* of October 19. Mr. Link was granted leave of absence from his position as assistant superintendent at Bedford on September 1, and is now a freight traffic expert in the ordnance department of the army with the commission of captain in the Ordnance Officers' Reserve Corps.

OBITUARY

Thomas P. Barry, formerly from 1891 to 1899 general passenger agent of the Iowa Central, died at the home of his son in St. Louis, Mo., on November 16, at the age of 75. Mr. Barry was for many years the general passenger and ticket agent of the old Marietta & Cincinnati, later acting in the same capacity on the Cincinnati, Washington & Baltimore.

Amos S. Crane, freight traffic manager of the Boston & Maine, with headquarters at Boston, Mass., died on November 22, at his home in Weston. He was born in 1848, at Washington, Berkshire county, Mass., and was educated in the public schools and at the Connecticut Literary Institute, Suffield, Conn. In 1877 he began railway work with the Erie Railroad at Chicago as contracting freight agent. Three years later he was transferred to Boston, as New England agent of the South Shore Line and Great Western Despatch which operated over the Erie. In 1883 he became general freight and passenger agent of the Boston, Hoosac Tunnel & Western, at Mechanicville, N. Y., and the following year he returned to Chicago as general freight agent of the Chicago & Atlantic. In 1890 he was appointed general freight agent of the Fitchburg Railroad, at Boston, Mass.; he was promoted in June, 1898 to general traffic manager and when that road was consolidated with the Boston & Maine in July, 1900, he was appointed export freight traffic manager of the Boston & Maine system. In 1907 he was appointed assistant freight traffic manager and since 1909 was freight traffic manager of the same road.

Railway Age Gazette

Volume 63

December 7, 1917

No. 23

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The nine regiments of railway engineers that represent the American railways behind the lines in France are now less than six months old, but they are already making history and tradition for their organization. We quote from a despatch from Washington dated Monday last. "High tribute to the gallant conduct of the American army engineers in France who were caught in the German encircling attack on the British lines near Cambrai, is paid in an official communication from the French government received here tonight by cable. The communication follows:

Our Engineers Win Praise at Cambrai

"We must remark upon the conduct of certain American soldiers, pioneers and workmen on the military railroad in the sector of the German attack west of Cambrai on November 30. They exchanged their picks and shovels for rifles and cartridges and fought with the English. Many died thus bravely, arms in hand, before the invader. All helped to repulse the enemy. There is not a single person who saw them at work who does not render warm praise to the coolness, discipline, and courage of these improvised combatants."

The president of the Association of American Railway Accounting Officers has issued a circular to members of the association urging each member to make a study of the unnecessary costs involved in the present system of intermediate inter-road rebilling. In addition to the unnecessary labor involved in this system there is also a delay to freight cars. Railway executives should not only carefully consider the facts which their accounting officers will present to them if the recommendations contained in this circular of the Accounting Officers' Association are carried out, but they should themselves direct their accounting officers to make such an investigation immediately. There is a great waste in intermediate inter-road rebilling and this system of billing is a survival of competitive practices which are rapidly being abolished. It is a waste which there can be no real excuse

Interline Waybilling Urged

for even on an individual road as distinguished from all the railroads. Tradition and inertia are the explanation of the continuance of the practice. The executives and accounting officers should override this prejudice.

The Pennsylvania Railroad, which owns all of the capital stock of the Pennsylvania Company, is now to assume the obligations of the Pennsylvania Company and to take over the actual operation of the Northwest system of the Pennsylvania Lines West and dissolve the holding company—the Pennsylvania Company—which now operates these lines. The vice-presidents of the Pennsylvania Company will become vice-presidents of the Pennsylvania Railroad, and while the organization will in a sense remain intact, it will actually become a part of the Pennsylvania Railroad organization and in time will presumably be as integral a part as one of the five grand divisions is now. Purely from an operating point of view this has distinct advantages. From a financial point of view the change made is at first sight one rather of form than of substance. All of the bonds and trust certificates of the Pennsylvania Company which are outstanding in the hands of the public are guaranteed by the Pennsylvania Railroad and are secured by the deposit of various forms of collateral. The elimination of the holding company would be of no importance except to substitute the credit of the Pennsylvania Railroad direct for this credit now one step removed by the interposition of the Pennsylvania Company. It would moreover bring the Pennsylvania Railroad one step nearer to the Pittsburgh, Fort Wayne & Chicago, which company owns the main line of the Northwest system from Pittsburgh to Chicago. This line is leased to the Pennsylvania Company and the lease is deposited under the Pennsylvania Company's first mortgage. There is no mortgage on the Pittsburgh, Fort Wayne & Chicago. The Pennsylvania Railroad's income account will be considerably benefited because the surplus of the Pennsylvania Company, after the payment of dividends to the Penn-

sylvania Railroad, has heretofore remained in the Pennsylvania Company's treasury and has therefore formed an equity only for the parent company. It will now go directly into the parent company's treasury as a part of operating income. This is a step toward simplification of the Pennsylvania system which should work out to the future benefit both of operation of the property and financing it.

Fifty per cent of the enormous number of freight-tracing telegrams now burdening the railroad telegraph and telephone wires all over the country are unnecessary; nearly 100 per cent of these messages are useless, so far as expediting the movement of freight is concerned; and this wasteful use of the

Wasteful Use of the Wires

wires is rapidly increasing. This is the substance of one of the significant paragraphs in the report of the convention of the Telegraph Superintendents' Association, published in the *Railway Age Gazette* last week, page 987. Sending letters by wire is a very old form of extravagance. Freight tracers are not the only abuse. The censoring that has been tried, here and there, during the last 20 years has worked temporary improvement, but no manager seems to have accomplished any sweeping or radical reform; or, if any has been accomplished, it is now swallowed up in the sea of war-conditions. We speak specially of the manager, for it seems quite plain that, to cut down the volume of telegraphing with appreciable and lasting effect, each general manager has got to stand, personally, very close to the man who actually uses the knife or the blue pencil. The committee has been instructed to send the association's resolution to the American Railway Association; which means, presumably, to the Railroads' War Board at Washington, as that body is in position to get immediate action on cutting out this unnecessary waste.

Some people are not satisfied with patriotism that is represented merely by service. They require a more violent manifestation of it. The Washington Times publishes a daily column of paragraphic comment which is rather bright and interesting, but which shows a cheerful disregard of logic. The other

Patriotism Not Sufficiently Violent

day this column included an item on the action of the general operating committee of the eastern roads in ordering a discontinuance of the Pennsylvania's Broadway Limited train to enable the road to handle more freight. Asserting that the train "for some strange reason was not well patronized and did not pay very well," and that the New York Central's Twentieth Century Limited "runs crowded and pays well," the writer applauded "the patriotic withdrawal of a train that doesn't pay and the business-like continuation of a train that does pay." All of which was "spoke sarcastic." What the Washington Times meant to imply, we assume, was that true patriotism would take off the trains that pay best, and leave on those which don't pay at all. But it happens that those which pay best are the ones on which the most people ride. That is why they pay best; and the better a train pays, the more people would be inconvenienced by cancelling it. It follows, according to the logic of the Washington Times, that the patriotic duty of the railways requires them to inconvenience as many people as possible. The Washington Times also advocates government ownership, doubtless considering it the most effective means available for accomplishing the purpose of inconveniencing the public. Ever since the railroads announced they would give up their competitive activities during the war many people have raised, as a sort of test of good faith, the question whether the Pennsylvania would give up its

Broadway Limited. We have not heard that the Pennsylvania management has applied for a medal for its action, but possibly it could best demonstrate its patriotism in the eyes of its critics by abandoning service altogether. This would accomplish its patriotic duty, as the Washington Times sees it, very completely.

THE NEW ENGLAND RATE HEARING

THE plan followed in the conduct of the recent hearing at Boston in the New England rate advance case has made a very favorable impression upon railroad officers and others who were present. One reason for favorable comment was the fact that the commission sent a New England man, the recently appointed commissioner, George W. Anderson, to take the testimony on the ground, instead of sending an examiner or instead of requiring the witnesses to go to Washington. Another was that the railroad or public utility commissioners of the six New England states were not only invited but urged to be present at the hearing and sit jointly with Commissioner Anderson.

Still another source of gratification was the attitude of the commissioner himself, who refused to allow the proceedings to be delayed or encumbered by attorneys representing organizations or individuals who had no direct interest in the matter involved. For example, he told the representative of the minority stockholders of the Boston & Maine that they had had their day in court and that a rate hearing was no place for them to appear. We understand that he also kept out several of the kind of "cranks" that frequently appear at hearings of this kind and who have frequently been treated with too great forbearance by the commission. The commission has often allowed its time to be wasted by witnesses who represented nothing but a desire to advertise their own ignorance.

Now that the commission has been increased in membership and allowed to organize itself more efficiently it is to be hoped that it will be able to return to its former practice of having important hearings more often conducted by commissioners.

The plan of holding joint hearings with the state commissioners is also a good one, especially in the absence of sufficient authority in the federal commission to prevent its decisions being to an extent nullified by state action. In his testimony in the recent supplemental fifteen per cent case before the commission President Willard of the Baltimore & Ohio said his company had not yet received the full benefit of the advance allowed by the decision of June 27 because two of the states through which it operates had refused to allow the advance in intrastate rates. Similarly the value of any decision the federal commission might make in New England could be greatly reduced by the various state commissions. Commissioner Anderson apparently made a special effort to emphasize this point during the hearing at Boston.

The plan of co-operation with the state commissions has been strongly advocated by the Interstate Commerce Commission as a means of avoiding the frequent conflicts of authority, and in its annual report it repeats its recommendation that without abdication of any federal authority finally to control questions affecting interstate and foreign commerce the commission be expressly authorized to co-operate with state commissions in the effort to reconcile upon single record the conflicts between state and interstate rates.

The commission has adopted the plan of holding joint hearings with state commissions in half a dozen cases during the past year and in its report it expresses the hope that the plan will prove effective. We believe the only really effective way to accomplish the desired result would be to give

the federal commission exclusive jurisdiction over the rates of carriers subject to its authority, but until this has been done, the commission's plan represents a desirable attempt toward a compromise.

TWO THINGS THE GOVERNMENT SHOULD DO

[The following editorial was written and put in type before the Railway Age Gazette had the slightest intimation that the Interstate Commerce Commission was going to make its special report to Congress recommending the principal action by the Government below advocated, viz.: the suspension during the war of the Sherman anti-trust law and the anti-pooling law. The Commission mentions as an alternative plan operation of the railways by the President, but as Commissioner McChord says in his minority report, the majority report takes the position, at least by implication, that this unification may be effected by the carriers and it is clearly apparent from what the majority of the Commission says that it favors leaving the operation of the railroads in the hands of their own managers rather than operation by the President.]

THERE are two things which it is extremely desirable the government should do as soon as practicable in order to enable the railways, and especially those in eastern territory, to better meet the enormous and increasing demands which are being made upon them.

First, it should appoint a government traffic manager. The government is today the largest shipper in the country. Every large industrial concern has a traffic manager in whose hands it places the work of dealing with the carriers in the handling of the shipments of all the departments and all the branches of its business. The government should have a man or men to do similar work for it.

At the present time all the departments of the government directly concerned with carrying on the war, and thousands of concerns which are working on government contracts, are permitted to put markings upon their shipments requiring that they be given preference in movement. The result is that a vast tonnage is moving under these preference orders; and this is one of the main causes of the congestion of the lines and terminals of the eastern railroads. When a railway, which is working close to the limit of its capacity, tries to give preferred movement to the bulk of its traffic it soon gets blocked and unable to give satisfactory movement to anything. Instead of some traffic being speeded up, all traffic is slowed down.

The government, having appointed its traffic manager, should give him complete authority to determine the order in which preference should be given to the movement of every kind of freight being handled for all government departments and all government contractors. The volume of the shipments made directly or indirectly on government account will steadily increase as the war goes on, and unless authority to control their movement is concentrated somewhere the present confusion, delays and congestion will be aggravated. Not all the freight that is being shipped directly or indirectly on government account is equally preferred. Some of it is "first preferred," some "second preferred," and so on; and it is for the government through its own representatives, not for the railroads, to determine the order in which preference should be given.

The second thing referred to, which the government ought to do at once as a necessary means of enabling the railways to handle the maximum possible traffic, is to repeal, or at least to suspend for the period of the war, the Sherman anti-trust act as it applies to the railways; the law giving the shipper the right to route his freight; and the anti-pooling section of the Act to Regulate Commerce.

It has been repeatedly asserted in the press that the plan adopted by the Railroads' War Board to relieve the freight congestion on the eastern lines is illegal, being especially in violation of the anti-pooling section of the Act to Regulate Commerce. Chairman Harrison of the Railroads' War Board issued a statement in the latter part of last week, denying this charge. The anti-pooling section prohibits the pooling of freight traffic or earnings. Mr. Harrison pointed out that if the word "pool" is applicable, what the War Board is pooling is merely the physical facilities, as what it is doing is to cause such common and joint use of the facilities of different lines, and such diversion of freight from the more congested to the less congested lines, as is necessary to enable them all to handle the maximum amount of traffic practicable.

This is all true enough. But it calls attention forcefully to a situation which, for the welfare of the nation, Congress ought at once to change. Much can doubtless be accomplished by the measures which the War Board is now adopting. But before the war is over, pooling, not merely of physical facilities, but of traffic and earnings, may and probably will be necessary to enable the eastern lines, and perhaps those of other territories, to render all the service the government and the public will need.

In order to handle the maximum traffic possible it is necessary that the railways should be free to route any or all kinds of it over the lines and through the gateways which, at any particular time, are most able to handle it. But to do that they must be able freely to divide the traffic among themselves; to divide the traffic, and at the same time reasonably protect the interests of all the individual lines. They must be able to arrange, and freely to change arrangements, for securing to each line the part of the total earnings to which it is entitled for the services which it renders to railway patrons and to other railways. With the existing laws standing in the way, the railways cannot legally make the arrangements necessary to enable them to move the maximum traffic which is practicable.

What would the public lose by suspending the laws mentioned for the period of the war, or even repealing them altogether in so far as they affect railways? Absolutely nothing. The Sherman act and the anti-pooling laws were intended principally to prevent combinations between railways which would result in the fixing or the maintenance of unreasonable rates. Under legislation since passed by Congress, neither a single railway nor any number of railways can advance a single interstate rate without the express consent of the Interstate Commerce Commission; and similar legislation also has been passed in most of the states regarding advances in state rates. Since the laws in question have no effect on rates, the only influence they exert is on service. The influence they exert on service only intensifies competition; and under present conditions the more competition in service there is, the worse the situation grows. Competition in service results in traffic being routed over indirect routes when it should be routed over direct ones; in trains being kept on which should be cancelled; in some roads getting more business than they are able to handle and in others getting less than they are able to handle; all of which reduce the amount of business which the railways as a whole can handle.

Competition in service may or may not be desirable under normal conditions. But the existing conditions are entirely abnormal. There is only one transportation question which is worth while considering during the war. That is, how may the railways be enabled to handle the government's and the public's business? One of the most important steps which could be taken toward enabling them to do this would be to remove all the obstacles legislation has placed in the way of their working together as a single system.

A WORLD-WIDE TENDENCY TOWARD HIGHER RATES

THE suggestions by Clifford Thorne and others that an increase of freight rates might be avoided by having the government take over the railroads are rather amusing in view of the increases in rates which have been put into effect or are under serious consideration in other countries where the governments either own the railroads or have practically taken them over during the war.

We publish in this issue a translation of an article from the *Economiste Français*, which describes the plan recently proposed by the French government itself for a general 15 per cent increase in rates on the larger systems of France to meet the deficits, for which the government has assumed responsibility, caused by increases in wages, prices of fuel and materials and expenses of all kinds. The article shows that these unprecedented rises in operating costs are by no means confined to the United States or even to the United States and France, but that they are the result of conditions in effect in all parts of the world. It also shows that in every case the remedy for this condition proposed or adopted has been the same. In many countries increases in rates were found to be necessary even before the war and since then, the article says, "the terrible conflict which has overturned economic life not only in the belligerent countries, but in the neutral as well," has forced an increase in rates in nearly every country which has any considerable railway system.

In Italy the rates, increased in 1911 and in July, 1914, were raised twice in 1916. In Switzerland passenger fares have been increased and now preparations are being made to follow the same course as to freight rates. In Russia rates have been undergoing increases since 1902 and since the war the government has placed taxes on transportation in such a form as practically to increase the rates. In Holland passenger rates were increased in 1909 and freight rates in 1916. In Norway rates were increased in 1913, 1915 and 1916 and a similar plan has been followed during the last three years. In Austria-Hungary freight rates were recently increased 30 per cent and even in Prussia the minister of railways has submitted to the Railway Council a proposal for a 10 per cent increase in passenger fares. Canada, Argentina and Denmark are also mentioned as countries where rates have been advanced to offset the increases in expenses.

The efforts of the railroads of the United States to increase their revenues by a higher scale of charges cannot be ascribed solely to an inordinate greed for profits. They are subject to a condition which is world-wide in its effect and they are seeking to meet that condition in the only way which is open to them, that of seeking permission to do what other kinds of business have done without requiring any permission.

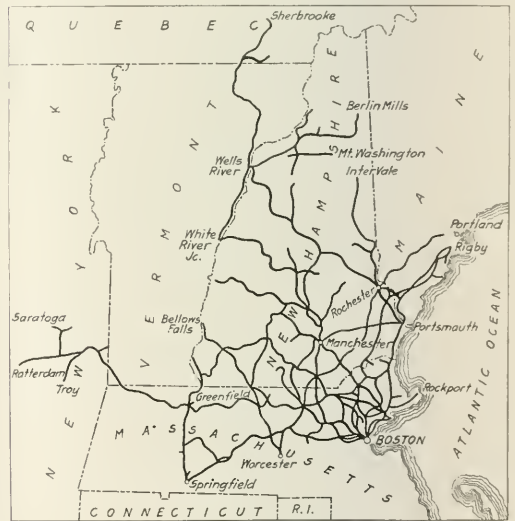
BOSTON & MAINE

JAMES H. HUSTIS, receiver of the Boston & Maine, in his statement before the Interstate Commerce Commission in the bearing on the 15 per cent rate case, drew a remarkably vivid and convincing picture of railroad conditions in New England, and more especially conditions on the Boston & Maine. He estimated that for the 1917 calendar year there would be an increase over 1916 in expenses of approximately \$10,100,000, of which \$4,100,000 would be in fuel cost and \$2,900,000 in wages, the remainder representing the higher costs of materials and the higher payments for car hire. He also dwelt briefly, but none the less impressively, on the need for the expansion of facilities of the Boston & Maine.

It is well known that during the years that Mr. Hustis was on the Boston & Albany he not only added immensely to the capacity of the plant through improved organization

and methods, but he carried out a very comprehensive plan of rehabilitation. During most of the years that Mr. Hustis was on the Boston & Albany the Boston & Maine was almost standing still. After the New Haven got control, considerable sums of money were spent for additions and betterments, but there is much that needs to be done now. If Mr. Hustis could have the necessary money, and supplies were obtainable at anything like reasonable prices, he could solve the transportation problem of the New England territory served by the Boston & Maine; and just as the Boston & Albany was immensely increased in value, but at the same time itself added an incalculable amount to the wealth of the territory it served, so if the Boston & Maine could be comprehensively developed it would add immensely to the wealth of the community served.

In the fiscal year ended June 30, 1917, total operating revenues of the Boston & Maine amounted to \$56,992,000, an increase over the previous year of \$4,917,000. Operating expenses amounted to \$42,448,000, an increase of \$6,250,000. After allowing for interest charges, rentals, etc., there was only \$1,880,000 left in 1917 as against \$4,066,000 in the fiscal year 1916. The immediate hopes of a financial



The Boston & Maine

reorganization of the Boston & Maine without sacrifice on the part of security holders, either of the parent company or leased companies, have been knocked into a cocked hat through no failure on the part of the Boston & Maine organization to work to the full for economies; and this work has been successful if measured in terms other than dollars and cents.

The tons of freight carried totaled 30,925,000, an increase over the previous year of 6.49 per cent. The average revenue trainload was 374 tons, an increase of 3.22 per cent, and the average loading per loaded car was 18.23 tons, an increase of 7.30 per cent. The Boston & Maine is more like the New Haven than like most other roads in the relation between passenger business and freight business. Out of a total operating revenue of nearly \$57,000,000, passenger service and service incidental thereto furnished about \$23,000,000. Economies in passenger service, therefore, bulk larger in proportion to total expenses on the Boston & Maine than they do on most roads. The total number of passengers carried in 1917 was 47,377,000, an increase over the previous year of 11.43 per cent, the average length

of journey remaining about the same—18.81 miles. The number of passengers per train-mile was 75.56, an increase of 8.66, and the number of passengers per car-mile was 21, an increase of 7.69.

These figures showing what is being accomplished under very extraordinary labor conditions are in striking contrast to figures showing expenses. The average cost of coal per gross ton on the tenders was \$4.47 in 1917, an increase of 36.70 per cent; and it must be remembered that the first half of the fiscal year showed comparatively small increases in coal cost per ton. Maintenance of way cost \$6,415,000, an increase of 7.15 per cent; maintenance of equipment, \$7,881,000, an increase of 19.63 per cent, and transportation, \$26,075,000, an increase of 19.93 per cent. The following table shows the percentage of each class of operating expenses to total operating revenues in 1917 and 1916:

	1917	1916
Maintenance of way and structures.....	11.3	11.5
Maintenance of equipment.....	13.8	12.6
Traffic expenses.....	7	8
Transportation expenses.....	45.8	41.8
Miscellaneous operations.....	5	4
General expenses.....	2.4	2.4
Total.....	74.5	69.5

The Boston & Maine is making such additions and betterments as are most immediately essential. In 1917 there was \$3,113,000 net spent for additions and betterments, which included \$1,821,000 for equipment, less \$575,000 for equipment retired. The Boston & Maine badly needs new equipment, but how difficult the situation is is indicated by the fact that when the company made inquiries as to the duplication of an order of 60 locomotives the tentative price was fixed at just twice what had been paid when the original order was delivered in the previous winter.

The Boston & Maine had cash on hand, time deposits, etc., of \$7,964,000, which included overdue interest, etc., of \$2,088,000. Loans and bills payable amounted to \$18,306,000.

Mr. Hustis has the reputation of being able to build up a fine organization with a high esprit de corps both among officers and employees. The tone of the following, which is the concluding paragraph in his annual report for the 1917 fiscal year, gives some indication of why possibly he has that reputation:

"The disturbed labor conditions, heretofore referred to, that have existed throughout the year do not make for the kind of loyalty and esprit de corps that will produce the best results for the railroad or for the public. It is proper, however, that the thanks of the management should be extended to those officers and men who, by their faithful performance of duty throughout the year, made possible the safe running of millions of train and engine miles. It means constant watchfulness and intelligent co-operation on the part of those who man the trains, care for the tracks, repair the locomotives and the cars, and operate the signal towers. The men and women at the stations and in the offices, whose duties are exacting and laborious, are also deserving of recognition. Thanks are expressed to all who have contributed to the results that have been achieved during the year."

The following table shows the principal figures for operation in the fiscal year ended June 30, 1917, compared with the fiscal year 1916:

	1917	1916
Average mileage operated.....	2,305	2,305
Freight revenue.....	\$33,909,489	\$31,963,489
Passenger revenue.....	16,878,757	15,028,317
Total operating revenues.....	\$6,414,842	\$2,075,428
Maintenance of way and structures.....	6,414,842	5,986,603
Maintenance of equipment.....	7,881,110	6,588,044
Traffic expenses.....	426,841	421,797
Transportation expenses.....	26,076,407	21,742,534
General expenses.....	1,363,339	1,238,292
Total operating expenses.....	42,448,077	36,197,958
Operating income.....	1,123,477	1,986,267
Tax.....	12,419,251	12,889,578
Gross income.....	13,585,106	15,059,293
*Net income.....	1,880,449	4,065,691

*After making deductions for interest, some of which was not actually paid.

Letters to the Editor

RECOMMENDS CREATION OF SERVICE DEPARTMENT ON RAILWAYS

NORFOLK, VA.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

For some time I have considered suggesting the creation of a new department on railways, to be known as the "department of service." Service is of paramount importance in an organization and my past experience leads me to believe that if the railways made it the business of some one department to see that service of the highest order was rendered, much criticism directed against the carriers would disappear.

The present organization on most lines does not provide a clearing house where important matters can be sifted and reduced to concrete form for the information of the president and the board of directors. A department with a competent, responsible head, therefore, would fill this need and result in a saving in expense and in added efficiency in service to the public, which cannot be overestimated. After 30 years' experience in railroad work I am firmly convinced of the need of the further application of business principles to the operation of our railways, and to this end I suggest the creation of a business department the organization and duties of which are outlined as follows:

DEPARTMENT OF SERVICE

Executives—	Organization	Statistical Bureau—
1 Vice-president.		1 Statistician.
1 Assistant to vice-president.		1 Assistant statistician.
1 Chief clerk.		4 Clerks.
1 Assistant chief clerk.		3 Stenographers.
6 Clerks.		1 File clerk.
3 Stenographers.		—
1 File clerk.		10
1 Assistant file clerk		<i>Labor Bureau—</i>
1 Messenger.		1 Negotiator.
—		1 Assistant negotiator.
16		1 Clerk.
<i>Inspection Bureau—</i>		1 Stenographer.
1 Chief inspector.		4
1 Inspector, maintenance of way.		<i>Summary—</i>
1 Inspector, maintenance of equipment.		16 Executives.
1 Inspector of transportation.		13 Inspection bureau.
1 Chief clerk.		10 Statistical bureau.
3 Clerks.		4 Labor bureau.
3 Stenographers.		43 Total number of officers
1 File clerk.		and employees.
1 Messenger.		—
13		

OUTLINE OF WORK

- Expenditure Supervision—*
 - Allotments to departments and sub-departments on monthly expenditure.
 - Supervision over all new-work expenditures.
 - Audit of vouchers and payrolls.
- Efficiency Methods—*
 - Analysis of present practices and methods.
 - Improvements in methods and practices.
 - Reduction in waste and non-essential methods and operations.
- Vital Statistics—*
 - Elimination of all except important statistics.
 - Issue of vital set of statistics to each department and sub-departments.
 - Comparative statistics of other roads.
- Organization Outlines—*
 - Establishment of organization and lines in various departments and sub-departments.
 - Co-ordination of organizations in various departments.
 - Co-ordination in all departments.
- Reports and Records—*
 - Establishment of standard reports and records.
 - Elimination of unnecessary reports and records.
 - Use of reports and records.
- Labor Adjustments—*
 - Analysis of schedules and comparison with other lines.
 - Grievance adjustments.
 - New schedule matters.
- Analysis of Results—*
 - Concrete analysis of operating results.
 - Comparative analysis with other lines.
 - Fixed standard to be attained in operation.

8. *Foreign Relations*—

- (a) Cultivation of friendly relations with connecting lines in all departments.
- (b) Analysis of methods used on foreign lines.
- (c) Co-ordination of operation at common points with other lines to eliminate waste.

9. *Publicity Matters*—

- (a) Determination of extent of advertising and its results.
- (b) Co-operation with federal, state, municipal and other officers to create friendly relations.
- (c) Education of the public on railway matters.

10. *Recommendations*—

- (a) Résumé of past month's operations with comments and explanation.
- (b) Monthly reports for all departments on program for succeeding month with recommendations on important operating matters.
- (c) Monthly meetings of heads of departments and sub-departments for general discussion of vital matters relating to company's interests.

L. C. FRITCH,

General Manager, Seaboard Air Line.

GIVE THE EXPERT A SHOW

CHICAGO, ILL.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Discussions on the opportunities afforded by railroads for the man who would succeed always seem to arrive at the same point—that a fellow should get a job with the road that will give him a chance to be a division superintendent, no matter with what department he may receive his preliminary training. This conclusion is founded on the proposition that, to become a general manager or executive officer, one must have attributes that befit a division superintendent. As a result a man whose bent is scientific rather than executive, who is better suited to be a specialist than a generalist, will find himself in a blind alley in a short time. Thus the mechanical engineer, the bridge engineer, the signal engineer, the engineer of tests, the engineer of design, the fuel engineer, the engineer of wood preservation and others, no matter how expert in their individual fields, are doomed always to remain such with emoluments measured entirely by the importance of their positions on the particular roads which employ them, save in the remote case where in addition to attributes making them valuable in their present position, they are executives of such exceptional merit that they may aspire to such positions as chief engineer or superintendent of motive power. However, their chances for this line of promotion are small because the division engineer and the division master mechanic are receiving training much better suited to develop them for the executive positions of the departments.

A lack of opportunities for the boss naturally holds down his subordinates and in consequence the sub-department of the specialist frequently suffers the stagnation under which poor men hang on and the good ones rot unless they have sense enough to quit or are fortunate enough to get fired, or, except for the opportunities which occur only at rare intervals when a vacancy actually appears at the head of the department itself.

The writer is familiar with the bridge department of a large road which we will say is in the southwest because it is not. For the last 15 years this road has undergone extensive growth and has built many more new bridges and other structures than would be built by a road merely making the current renewals. In consequence its drafting room force has been large. It has also enjoyed a reputation for high grade work, has been a leader in the development of modern construction practice based on scientific methods and has recruited its men from the best of the technical graduates or from men experienced in the drafting rooms of bridge companies. In view of this the personnel of its drawing room has ranked as high as any similar organization in the country. Obviously this railroad has had little opportunity to advance these men, with the inevitable result that the better ones quit when they perceive that they have reached the limit of advancement. Many of these men have subsequently achieved success in other lines.

Selecting from this group at random we find that two of them are now contracting engineers for large bridge companies; three are structural engineers in private practice; three are efficiency experts; two are civil service administrators and three are consulting public utility experts. These men have made their way and are at present in positions which in most cases pay as much or more than the salaries paid by railroads to bridge engineers. Thus we see that the service of a group of able men was lost not only to the road that trained them but to all other railroads as well, for, to the best of my knowledge, only two men who were employed in responsible positions in this bridge office are now serving as bridge engineers of other railroads and in each of these cases the man secured his position through an acquaintance antedating his employment with the road in question.

The example cited above is not entirely a peculiar one. Other large railroads are also training men for positions not only in the bridge department but in other technical departments as well. Technical work on railroads naturally attracts good men. It is interesting and the training is valuable but almost invariably the man finds he must look elsewhere for promotion. In the case of the small road the situation is somewhat different. The work is on a much smaller scale and in less variety and in consequence does not afford as broad a training, while, as the department is small, it offers less of a selection from which to pick a department head than on the large railroad.

This suggests a solution—a freer exchange of men between railroads or, to put it more specifically,—the recruiting of bridge engineers, engineers of tests, etc., for the smaller roads from subordinate positions on the larger ones and also the advance of the expert from one road to another as his work demonstrates his capacity for the position on the road of larger activities.

To a certain extent this practice is being carried out at the present time but only in a more or less haphazard fashion, limited by the extent to which the technical men on one road become known to those on another and almost entirely without any attempt at co-operation between the railroads. Development of this idea is also restricted by the fact that its objections receive greater notice than its advantages. The bringing of a man from another road has a tendency to discourage the subordinates who may have had reason to believe that they were in line for promotion. This objection is valid where the road in question has had an opportunity to build up an efficient organization in the particular department. The objection, however, is not nearly so clear in the case of a small road where the staff of the expert consists of only one or two men. For their own good the subordinates in such a case owe it to themselves to seek a broader experience elsewhere, for the small road, with its limited organization and direct contact between the minor subordinates and executive officers, is much better suited to the development of the all-around executive than the expert. In conclusion, and with reservation for such limitations as have been mentioned, the suggested exchange of men would have the advantage for the large road that its organizations would be kept alive through the more rapid advance of the men, while the smaller roads would secure men who have had a broader and more diversified experience. In general, an advantage would arise from the free exchange of ideas, practices and methods which such a system would bring about.

TECHNICAL.

SCRAP METAL IN 1916.—A report of the United States Geological Survey shows that in 1916 the total quantity of scrap metal of various kinds recovered in the United States was valued at \$265,377,856. This was more than double the value, and represented nearly double the quantity of scrap metal recovered in 1915.

The Commerce Commission's Annual Report

A Review of Its Activities During the Year and Those of Its Bureaus and Divisions. No New Recommendations

NO new recommendations are contained in the 31st annual report of the Interstate Commerce Commission to Congress, covering the year ended October 31, 1917. The commission repeats several recommendations made and explained in previous reports, including those for legislation to give it authority to co-operate with state commissions in rate matters, to provide control over railway capitalization, to require the standardization of operating rules and to prohibit trespassing, but the greater part of the report is devoted to the routine record of the work of the commission and its various bureaus and divisions. It also includes a general discussion of transportation conditions, particularly as they have been affected by the war, in which it says, in part:

TRANSPORTATION CONDITIONS

Since 1907 there were few times when the number of freight cars available did not exceed the number required for the transportation of the country's commerce. It is true that, owing to the uneven distribution of cars over the various roads, there were occasional periods when the needs of one locality or another were in excess of the cars immediately available, but throughout this period the total number of freight cars available as a rule considerably exceeded the number required. As a result of this condition there was slight incentive to acquire additional equipment, and on many lines the idle cars were allowed to deteriorate.

These conditions continued for some time after war began in the summer of 1914, and while there was great congestion at the Atlantic ports during 1915 the number of cars available in that year exceeded the demand. The number of idle cars was, however, steadily declining, and by the fall of 1916 car shortage had become acute.

Through the railroads' Commission on Car Service efforts have been made to relieve the difficulties resulting from car shortage and congestion. It has co-operated with the various governmental agencies, and through those efforts substantial increase in efficiency of available transportation facilities has been secured, and car shortage conditions in different localities have been improved by requiring railroads to haul thereto empty cars which were not so badly needed elsewhere.

Without attempting to detail the activities on the part of the railroads through this organization it will suffice here to say that they have responded to and supported the executive committee, which in an earnest way has attempted to deal with the vexatious and troublesome questions and to meet the unprecedented demands upon the railroads.

The commission has since undertaken to regulate car service throughout the United States through its Bureau of Car Service. Where occasion requires, orders or directions will issue under the car service act and directly to the carrier or carriers concerned. Subject to this fundamental principle, the commission is availing itself, and will continue to avail itself, of co-operative effort on the part of the carriers' commission on car service. The latter has a large force of assistants under its control both in Washington and in the field. The present is peculiarly a time for the avoidance of unnecessary expense and duplication of work, and it has seemed to this commission desirable to utilize to the fullest extent all means for insuring maximum efficiency in the handling of cars. The work of the bureau is steadily growing in volume, and its organization is being built up as demands require.

Transportation conditions have been abnormal throughout the entire country during the past year. A condition of extreme congestion has obtained in the territory north of the Ohio and Potomac rivers and east of the Indiana-Illinois state line, the workshop of the country, to which the raw materials of the south and west, together with the food products of those sections, naturally gravitate.

Even before our country was drawn into the war the railroads were handling an extraordinarily heavy traffic, heavier by far than at any time in their previous history. This was greatly increased by the war, and as that began in the spring, when the fuel and crop movement is normally light, transportation conditions during the past summer have probably been better than if our war activity had been thrust upon the carriers during the height of the fall or winter traffic movement.

The adoption by the carriers of new rules regulating the distribution of cars as between themselves and the enactment of the Esch car service act have already been mentioned. In this way equipment has been taken from sections where it was less needed to other sections, where military and commercial needs required more equipment than was available, and such stupendous movements as those of the cantonment construction material and the troop transfers have been made without seriously interfering with the commercial business of the country.

While conditions have been extraordinary and while traffic has not always moved as carriers and shippers would have had it moved, the essential needs of the country have to date been cared for. Much was said during the past winter as to the danger of freezing and famine on account of failure adequately to transport fuel and foods, but history will record no such calamity.

Conditions have now reached the point where it has become imperative under the power of the transportation priority act, approved on August 10, 1917, to effect priority in transportation for certain traffic necessary to the national security and defense. The first step taken in this direction was to insure to the upper lake states an adequate supply of coal for the coming winter. More recently the use of open-top cars suitable for the transportation of coal and commodities necessary in the metal, sugar, and fertilizer industries has been denied for the transportation of other commodities not essential in the nation's present emergency. It is to be expected that similar and broader action of this sort will be necessary in the near future.

In the work of distributing empty cars to producing sections of the country, taking care of emergencies arising on particular lines or in particular sections, the Bureau of Car Service is working with the Commission on Car Service, as before indicated.

The co-operation of the shippers and carriers is worthy of especial note. The volume of business being offered to the carriers for transportation materially exceeds the assimilating ability of the transportation instrumentalities. Owing to the demand upon car and locomotive building plants for equipment for use abroad, both by our own forces and by our allies, and to the unprecedented difficulty of securing labor and material, it is impossible at the present time for these plants to do much more than replace the equipment worn out in service in the United States. It is apparent that the solution of the car service problem until such time as additional equipment and facilities can be provided lies in securing the maximum use of those already existing. This

commission is co-operating with the transportation priority director, the food administrator, and the fuel administrator, agencies appointed by the President to assist in carrying forward the conduct of the war.

OPERATING INCOME OF RAILWAYS

The accompanying table gives a statistical review of railway operations since 1891. Notwithstanding the unreliability of book values as a statement of investment, especially in the earlier years, and the changes in accounting requirements which affect the comparability of statistics, the

6.35. For 1917 the table this year gives an estimate of 6.5 per cent.

A condensed abstract of the report, outlining the principal activities for the year, follows:

ABSTRACT OF REPORT

The number of formal complaints filed during the year was 651, a decrease of 203 as compared with the previous year; 746 cases have been decided and 106 have been dismissed by stipulations or on complainant's request, making a total of 852, as against 806 during the previous year.

ANALYSIS OF OPERATING INCOME OF RAILWAYS IN THE UNITED STATES, JULY 1, 1890, TO JUNE 30, 1917, INCLUSIVE, AND COMPARISON OF SUCH INCOME PER MILE OF ROAD, ETC., WITH BOOK COST PER MILE OF ROAD, ETC.

Year ended June 30.	Results of operation.										Ratio of mileage operated under trackage rights to mileage with trackage figures omitted.	Average income per mile operated (trackage be included in divisor).	Average income per mile operated, adjusted to eliminate effect due to duplication on account of trackage.	Book cost of road and equipment.	Number of miles of road represented.	Average book cost of road and equipment per mile of road.	Ratio of column (j) to column (m).	Average freight revenue per ton-mile.
	Operating revenues.	Operating expenses.	Operating ratio.	Taxes.	Income from operation.	Number of miles operated (including trackage rights).	Per cent.	Per cent.	Per cent.	Per cent.								
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)				
			Per cent.				Miles.	Per cent.									Per cent.	Cent.
1891.....	\$1,096,761,395	\$731,887,893	66.73	\$33,280,095	\$331,593,407	161,275.17	2.43	\$2,056	\$2,106	\$8,738,533,165	143,516.64	\$59,673	3.77	0.835				
1892.....	1,171,407,343	789,997,906	66.67	34,033,435	335,355,832	132,337.30	2.49	2,194	2,249	8,594,334,830	161,238.07	55,424	3.83	.878				
1893.....	1,220,751,874	827,921,299	67.82	35,514,083	336,313,888	199,779.84	2.49	2,099	2,151	8,937,515,760	164,008.71	53,323	3.88	.783				
1894.....	1,073,391,797	731,414,322	68.14	38,125,274	303,822,201	175,690.96	2.44	1,721	1,771	9,073,470,532	167,741.38	54,867	3.20	.830				
1895.....	1,075,371,462	735,720,433	67.49	39,832,433	308,815,314	177,745.25	2.47	1,743	1,785	9,203,499,619	167,741.38	54,867	3.28	.831				
Total.....	5,637,653,871	3,797,941,925	67.37	181,005,986	1,657,905,960	846,889.52	2.46	1,958	2,005	33,778,901,741	635,524.80	56,210	3.57					
1896.....	1,150,189,376	772,980,014	67.21	39,970,791	337,209,541	181,982.64	2.66	1,833	1,902	9,500,327,733	173,890.12	54,644	3.48	.891				
1897.....	1,122,089,773	752,924,764	67.06	43,137,844	326,427,165	183,281.25	2.75	1,781	1,830	9,703,321,228	174,673.22	55,586	3.29	.783				
1898.....	1,247,325,621	817,973,276	65.58	43,828,224	385,324,121	184,648.26	2.99	2,088	2,150	9,760,581,424	170,090.63	57,395	3.75	.733				
1899.....	1,315,610,118	856,968,999	65.21	46,357,632	410,305,487	187,534.68	2.92	2,188	2,232	9,951,840,805	177,638.53	56,079	4.02	.724				
1900.....	1,487,044,814	961,428,511	64.65	48,332,273	477,284,630	192,556.03	3.04	2,479	2,554	10,263,313,400	181,337.01	56,567	4.52	.729				
Total.....	6,320,239,702	4,161,884,594	65.85	221,605,764	1,935,748,344	930,005.86	2.87	2,083	2,143	49,195,392,590	877,668.97	58,052	3.82					
1901.....	1,588,526,037	1,030,307,270	64.85	50,944,372	507,184,395	195,561.92	2.95	2,593	2,670	10,405,065,085	182,734.04	56,941	4.69	.750				
1902.....	1,726,380,267	1,116,248,747	64.66	54,465,437	555,666,083	200,151.56	2.76	2,776	2,833	10,638,321,376	187,442.35	56,892	5.02	.757				
1903.....	1,900,840,907	1,257,538,832	66.16	57,449,599	585,458,188	203,313.54	2.96	2,822	2,936	10,973,504,903	193,823.01	59,618	5.19	.763				
1904.....	1,975,174,091	1,338,836,233	67.79	61,606,354	574,381,484	212,243.20	3.23	2,707	2,794	11,511,337,131	198,841.19	57,838	4.83	.780				
1905.....	2,082,482,406	1,350,602,152	66.78	63,474,679	628,405,575	216,973.61	3.61	2,806	3,001	11,951,348,943	203,228.07	58,088	5.10	.766				
Total.....	9,273,409,708	6,133,683,274	66.14	288,430,411	2,851,296,023	1,030,245.83	3.11	2,768	2,854	55,499,807,444	966,068.66	57,449	4.97					
1906.....	2,325,765,167	1,536,877,271	66.08	74,785,615	1,012,281,375	222,310.39	3.67	3,212	3,339	12,420,287,938	208,310.51	57,624	5.58	.748				
1907.....	2,589,165,578	1,718,515,811	66.33	80,312,715	1,160,277,583	227,451.83	3.80	3,333	3,470	13,080,314,338	210,792.39	61,816	5.61	.749				
1908.....	2,440,438,832	1,710,404,791	70.08	81,555,116	1,155,681,805	227,297.02	3.90	2,811	2,952	13,215,706,510	213,888.36	61,779	4.78	.751				
1909.....	2,473,205,314	1,650,031,204	66.72	90,520,014	1,232,642,083	231,981.11	4.16	3,145	3,276	13,609,183,515	221,679.45	61,341	5.34	.763				
1910.....	2,812,141,575	1,881,879,118	66.92	103,795,701	1,386,466,756	235,585.51	4.49	3,487	3,644	14,387,816,009	226,114.66	63,631	5.73	.733				
Total.....	12,640,856,453	8,527,708,198	67.46	433,977,851	3,679,170,401	1,117,019.77	4.01	3,208	3,337	66,661,398,420	1,080,785.57	61,679	5.41					
1911.....	2,852,854,721	1,976,331,864	69.28	108,379,512	1,768,213,435	233,433.61	4.68	3,156	3,334	15,195,262,635	223,832.29	67,883	4.87	.757				
1912.....	2,906,415,869	2,035,057,329	70.02	120,001,531	1,786,414,338	236,838.74	4.78	3,044	3,193	15,871,573,628	229,802.66	69,049	4.62	.741				
1913.....	3,113,117,831	2,235,922,626	70.02	127,331,960	1,885,833,248	242,657.12	4.79	3,420	3,581	16,351,331,266	233,456.23	70,042	5.12	.729				
1914.....	3,111,336,422	2,266,179,768	72.83	140,331,575	1,970,685,079	245,621.55	4.79	2,869	3,006	16,135,667,810	233,985.90	71,770	4.19	.733				
1915.....	2,956,153,202	2,088,652,456	70.65	133,298,167	1,822,402,079	256,215.61	4.58	2,812	2,972	17,247,101,881	237,272.11	72,689	4.09	.732				
Total.....	15,019,978,408	10,602,174,743	70.59	635,562,748	3,782,240,557	1,234,757.63	4.72	3,063	3,208	81,605,281,248	1,160,459.89	70,321	4.56					
1916.....	3,472,641,941	2,477,202,778	65.58	151,599,841	1,043,833,822	257,544.41	4.79	4,032	4,247	17,525,576,908	233,392.31	73,209	5.80	.716				
1917.....	3,824,419,739	2,581,838,511	67.51	172,637,276	1,069,750,514	230,906.31	10.72	4,633	4,851									

¹ Mileage returns for balance sheet figures not stated in the annual statistical report of the Commission.

² Does not include figures for 1891, as no mileage is stated for that year.

³ Returns do not include data for switching and terminal companies.

⁴ The averages shown for 1908 to 1912 are not fully comparable with those for previous years, chiefly for the reason that the figures upon which they are based do not include returns for switching and terminal companies.

⁵ Represents returns for Class I and Class II roads and their nonoperating subsidiaries.

⁶ Represents returns for Class I and Class II roads and their nonoperating subsidiaries. Figures are taken from the 1913 statistical report.

⁷ Returns for operations, columns (b) to (j), inclusive, are based on figures which exclude returns for so-called small roads and switching and terminal companies.

⁸ Returns for Class I and Class II carriers.

⁹ Figures in columns (b) to (g), inclusive, and (i) are from monthly reports of revenues and expenses of Class I roads, excluding switching and terminal companies.

¹⁰ Based on estimated figures.

commission says such a statement has value in showing the general trend of railway development in the United States.

It will be noted that the average freight revenue per ton per mile in 1916 shown in this table is lower than for any other year. The rate of return on property investment, shown in column *m*, is given as 5.8 for 1916, based on the property account of roads of Class I and Class II and their non-operating subsidiaries. In a corresponding table published last year the percentage of return was estimated at

A total of 1,228 hearings were conducted and approximately 210,133 pages of testimony taken, as compared with 1,485 hearings and 154,488 pages during the preceding year.

The number of proceedings instituted under the investigation and suspension docket was 196, a decrease of 27, and 223 such proceedings have been disposed of, an increase of 17. In addition, many new schedules were added to pending investigations by supplementary orders and a large

number were suspended by order of June 27 in The Fifteen Per Cent Case. Suspension was refused in 236 cases, a decrease of 76 as compared with the previous year. Informal complaints numbering 5,300 were received, an increase of 361.

The matter of greatest interest and importance coming under the fourth section of the act has been the question of the proper adjustment of transcontinental rates. This was discussed at some length in the last annual report, and it was shown that the fourth section applications protecting this adjustment had been reopened for further hearing. Since that time a decision has been rendered. Owing to protests against the tariffs offered for filing by the carriers purporting to comply with the order, informal hearings have been set on these protests in New York, N. Y.; Chicago, Ill., and Portland, Ore.

A hearing has been had respecting approximately 500 applications of all carriers in the country, relating to class and commodity rates, which are higher as a through route than the aggregate of the intermediate rates. This matter is now pending, and when a decision thereupon is reached all of the fourth section applications of every carrier which sought relief from the aggregate of the intermediates provision of the fourth section will have been passed upon.

RATE SCHEDULES

Tariff publications numbering 166,810 and containing freight and express rates, passenger fares, and classification ratings were received. The figures stated include more than 35,000 schedules naming proposed increases in rates which were suspended and also a like number of suspension supplements, none of which resulted in the establishment of rates, so that, in fact, the number of rates becoming effective during the period named did not exceed that of previous years. During this period 2,196 schedules that were tendered for filing were rejected. Reference by shippers and the public in general to the tariff files has increased to such extent as to seriously interfere with the regular work of the bureau of tariffs, and to meet this situation a duplicate tariff file has been established and equipped for the use of the public.

Since the fifteenth section amendment of August 9, 1917, carriers have filed 1,400 applications for authority to file tariffs making increases in rates. Prior to November 1, 1917, 59 applications were approved and 4 denied. The approved applications were for the most part for the purpose of correcting errors in tariffs. It required some time to perfect an organization for the handling of matters arising under this amendment, and this accounts for the small number of applications passed upon. While arrangements for administering this law were being perfected a large number of applications accumulated. All those difficulties will gradually be removed under a definite and uniform mode of procedure, and it is believed that experience will show that the amendment is capable of administration and enforcement in its full spirit without any hardship, and that, while the commission's power to suspend schedules has not been abridged, eventually these matters can in the main be more satisfactorily handled in this way than under suspension proceedings.

During the year the Southern Classification Committee has been reorganized along the lines previously adopted by the Official and Western Classification committees, and it now consists of a permanent committee of three, which will sit in practically continuous session dealing with classification matters. Some progress has been made in the direction of uniformity in the three classifications, although, as heretofore, it has been slow. Including about 830 items which are in accordance with the recommendations of the Uniform Classification Committee, except that no carload rating is assigned, the Southern Classification Committee has accepted

about 72 per cent of the Uniform Classification Committee's recommendations, and the southern classification is now about 73 per cent uniform. This is lower than the percentage of uniformity in the western and official classifications. The Western Classification Committee has accepted without change 91 per cent of the recommendations reported by the uniform committee, and 87 per cent of the current western classification is in accordance with uniform recommendations. The Official Classification Committee has accepted about 87 per cent of the recommendations of the Uniform Classification Committee and the official classification is uniform to the extent of 81.81 per cent.

Early in the present year the Uniform Classification Committee, which was organized about 10 years ago and which previously consisted of nine members, three from each classification territory, was reduced to one representative from each classification territory and a chairman. The commission is assured that this reduction is not indicative of indifference with respect to uniformity in classification, but is in line with the reorganization of the several territorial classification committees. Increased activity in the direction of uniformity is promised as a result of these changes. The work performed by the Uniform Classification Committee has been carefully done.

The block system of stating express rates, which has proven to be generally satisfactory, has, during the year, been adopted for intra-state traffic in one additional state and is now effective in 43 states and parts of Canada. Negotiations are in progress looking to its adoption in the remaining states.

BUREAU OF INQUIRY

Fifty-six indictments were returned for violations of the act to regulate commerce and acts supplementary thereto. Twenty-four of these indictments were against carriers or carriers' agents and 32 against shippers, passengers, or interested parties other than carriers.

During the year 37 cases were concluded. In these cases pleas of guilty were offered by 17 defendants and pleas of *nolo contendere* by 3 defendants. In 9 cases verdicts of guilty were rendered, in 3 cases verdicts of not guilty were rendered, and in 1 case the jury disagreed. In 3 cases demurrers to indictments were sustained. In 3 other cases indictments were dismissed upon motion of the government, but in each case pleas of guilty were offered on other indictments returned in the same cases.

There has been a notable decrease in the number of prosecutions against shippers for abuses of transit regulations, for falsely billing shipments, and for filing false claims for the purpose of obtaining unlawful allowances out of the rates applicable for the transportation of property. When the carriers exercise reasonable diligence in properly inspecting property offered to them for carriage their care results in protecting their revenues, and in eliminating discriminations, and in transportation for shippers at known published rates.

Rigid enforcement of the demurrage rules will do much to aid in the relief of car shortage, the commission says. Several indictments for alleged failure to impose demurrage charges are now pending trial in the district courts.

BUREAU OF LAW

On October 31, 1916, there were 32 cases involving orders or requirements of the commission pending in the courts, of which 11 have been concluded. Of the remaining 21 cases, 6 have been argued, submitted, and taken under advisement by the Supreme Court, and 3 are pending argument and submission to that court. Eleven are under advisement or pending hearing or final hearing and submission in the district courts, and 1 is pending dismissal or reargument in a district court. Since October 31, 1916, 10 cases have been in-

stituted in the courts, 2 of which have been concluded. One has been argued, submitted, and taken under advisement by the Supreme Court and the remaining 7 are under advisement or pending argument and submission or dismissal in the district courts. As a result of the foregoing proceedings, there are now 10 cases pending in the Supreme Court and 19 cases pending in the district courts.

Six cases to which the commission was a party have been decided by the Supreme Court of the United States. In four of these, the Terminal Cities Case, the Lake Line Case, the Sheldon Rebate Case, and the Vulcan Coal Case the position taken by the commission was sustained, while the decisions in the Nashville Switching Case and the Paraffine Tank Car Cases were adverse.

BUREAU OF CARRIERS' ACCOUNTS

In the last annual report reference was made to the improved methods which had been instituted in the conduct of examinations of the accounts of carriers in the field. A creditable number of field examinations has been conducted during the past year, resulting in the discovery, and consequent discontinuance by the carriers, of various erroneous accounting practices. These examinations have proven to be essential and effectively useful, not only in securing uniform accounting but also in the prosecution of our work as a whole. One result of this feature of contact with the carriers' accounts is that any unwholesome finance, artificial returns of income and outgo, and unlawful rate manipulations, which must of necessity be carried into and be shown on its books or other records, become more difficult of accomplishment.

Recent accounting examinations indicate a noticeable and encouraging activity by the carriers during the last two or three years along constructive and economic lines, and this is particularly true since our own country became a belligerent in the war. Such information becomes accessible under the established accounting system and will be of value in looking toward permanent improvements in the carriers' methods and practices.

In August, 1917, the commission was asked by the Special Committee on National Defense of the American Railway Association to give consideration to the possibility of reducing the amount of statistical work required of carriers during the period of the war. A conference was held with representatives of the carriers and of the state commissions, and this matter was also considered by the National Association of Railway Commissioners at its annual meeting. As a result, the annual report forms prescribed for the year 1917 will be considerably simplified by the omission of certain schedules and the modification of others.

BUREAU OF SAFETY

The work of the bureau of safety has been substantially similar in character to the work of that bureau in previous years. A detailed report of its work is published separately.

During the calendar year ended December 31, 1916, 136 employees were killed and 2,440 injured in coupling and uncoupling cars; casualties resulting from employees coming in contact with overhead and side obstructions and from falling from and getting on and off cars occasioned 564 deaths and 15,937 injuries. This represents an increase of 13 in the number killed and 246 in the number injured in the former class of accidents, and 59 in the number of killed and 2,126 in the number injured in the latter class of accidents, as compared with the fiscal year ended June 30, 1916.

During that fiscal year, 187 cases, involving an aggregate of 542 violations of the law, were transmitted to the several United States district attorneys for prosecution. Cases comprising 127 counts were tried, of which 88 counts were decided in favor of and 37 counts adversely to the govern-

ment; 2 counts are still pending decision. Cases involving 478 counts were confessed, and 10 counts were dismissed.

During the past fiscal year there were transmitted to the several United States district attorneys for prosecution 113 cases, involving 1,197 counts, of violations of the hours of service act. Cases involving 811 counts were confessed and 444 counts were tried, of which 125 were decided in favor of the government and 198 in favor of the carriers. The remaining 121 counts are still pending decision. Cases involving 878 counts were dismissed, 841 of which were based upon the carriers' failure to report all instances of excess service, as required by an order of the commission. Two cases were decided by the Supreme Court, one against and one in favor of the government. In the circuit courts of appeal 8 cases, involving 44 counts, were decided in favor of the government, and 3 cases, involving 14 counts, were decided in favor of the carriers. Cases involving 185 counts are still pending in the circuit courts of appeal.

INVESTIGATION OF ACCIDENTS

During the year ended June 30, 1917, 80 train accidents, comprising 54 collisions and 26 derailments, were investigated. In these accidents 174 persons were killed and 827 persons were injured; the collisions caused the death of 132 persons and the injury of 638 persons, while in the derailments 42 persons were killed and 189 were injured. Twenty-one of the collisions investigated occurred on block signaled lines, 11 in automatic block signal territory, and 10 in non-automatic block signal territory, while 33 of the collisions occurred on lines operated by the train order and time interval system.

Of the 11 collisions investigated which occurred in automatic block signal territory, 8 were due to failure of enginemen to obey signal indications. This comparatively large number of accidents of that character emphasizes the necessity for the development and use of some form of automatic train control device to supplement existing block signal apparatus.

The investigation of the collisions in nonautomatic block signal territory has almost without exception disclosed lax observance or enforcement of rules. Nearly all of these accidents which were investigated during the past year could have been averted by proper observance of the rules which were in effect.

More than half of the collisions investigated occurred on lines operated by the train order and time interval system. In some of these cases inadequate operating rules were found, and in other instances it was found that practices not sanctioned by the rules were being followed. Many of these accidents were due to inherent weaknesses of the time interval method of operation, and a large proportion of them could have been prevented by a proper application of block signal principles.

In previous reports the commission has recommended legislation requiring the standardization of railroad operating rules. It is essential to the safety of train operation that rules be explicit and uniform, capable of being easily understood and applied, and not liable to be misinterpreted. Such standardization of rules can be accomplished only by federal legislation, which the commission again recommends.

The commission's accident statistics demonstrate that a large percentage of the derailments occurring from year to year are due to two causes, namely, defects of equipment and defects of roadway.

BUREAU OF LOCOMOTIVE INSPECTION

The work of the bureau of locomotive inspection during the year ended June 30, 1917, although covering a wider field, due to the extension of the law, has been substantially similar in character to its work in previous years, and is

shown in detail in the report of the chief inspector, which will be published in next week's issue.

Of 616 accidents, 389 in which 52 persons were killed and 469 injured were due to failure of locomotive boilers or some part or appurtenance thereof. Two hundred and twenty-seven of the accidents, in which 10 persons were killed and 252 injured, were caused by failure of some part of the locomotive or tender other than the boiler and its appurtenances and were investigated under the amended law.

Much of the increase in the number of defective locomotives and the accidents and casualties resulting from failure thereof has, perhaps, been brought about by unprecedented operating conditions, which, together with the shortage of labor and material, may have made difficult the proper maintenance of locomotives.

This, however, is not a justification for the operation by any carrier of locomotives that are in an improper condition for service, and the fact that some carriers by diligent efforts and careful supervision of repairs have not only maintained the condition of locomotives but have improved it during the past year, thereby increasing operating efficiency, is evidence that locomotives can be properly maintained even under the present exacting operating conditions. This can be accomplished by more careful inspection of locomotives by the carriers and closer supervision by those in charge to see that defects reported are properly repaired before the locomotive is returned to service.

The importance during the war of maintaining locomotives to the highest degree of efficiency and of avoiding unnecessary delay has been constantly kept in view, and every privilege consistent with the purpose of the law has been allowed.

In general, rules which promote safety in the operation of locomotives also promote efficiency; therefore, both in the preparation and in the enforcement of the locomotive inspection rules, efficiency in the operation of locomotives has been considered as second only to safety, and their enforcement has been so directed as to promote both.

BUREAU OF VALUATION

The road and track parties of the engineering section inventoried between October 1, 1916, and September 30, 1917, 52,946.65 miles of main line and 81,444.39 miles of all tracks. This was in excess of the previous year and in excess of the estimate for the current year. By January 1 next more than 150,000 miles of main line will have been covered by the road and track parties and about 100,000 miles will remain. While war conditions have interfered with the progress of this work, it is still believed that our estimated date for the completion of the work as given in the last report should stand. The engineering forces should substantially complete their field work during the year 1919 and should clean up the balance of their field work and finish their office work during the year 1920.

It is believed that the work of the land and accounting sections is in step with that of the engineers and that their work should be completed within the above time limit, provided the necessary information can be obtained from the carriers.

Arrangements had been made to begin an inventory of the long-distance telephone lines of the American Telephone & Telegraph Company last spring, but the breaking out of the war laid upon that company such unusual demands from the War Department that it was felt to be unreasonable to ask it to take up this valuation work, which was accordingly postponed upon its properties for the present.

It would be highly desirable in the prosecution of this work to finish each property before proceeding to the next, but this has been found impracticable in actual experience. The carriers are required to furnish certain information, and the work of the commission upon a particular property

can not be completed until that information has been furnished. The inability of the carriers to promptly give this information has rendered it impossible to complete reports upon their properties. For example, each carrier is required to file a schedule of its equipment, stating, among other things, the original cost of each piece of equipment as shown by its books. It is required to file another schedule showing its lands and the cost of each parcel when disclosed by its records. While this looks simple in the statement it is a very extended process in fact. The number of men who can be employed upon the records of the carrier in searching out these facts is limited so that in case of systems of considerable size a great deal of time is required. And yet no final report can be prepared by either the engineering, land, or accounting sections until these returns have been received.

This has made it necessary to pass on to other carriers before completing work on those first undertaken and the actual situation today is that the commission is engaged in the valuation of nearly every railroad system of any importance in the entire country, although scarcely any of those systems have been completed. This does not mean that the completion of the work as a whole will be delayed, for it seems probable that these returns will all be made within the time limit above named, but simply that the valuation of individual carriers can not be finished in proportion as the entire work progresses.

CO-OPERATION WITH STATE COMMISSIONS

In the last annual report the commission made certain suggestions and recommendations with the view of reducing and eliminating, to the greatest extent possible, the conflicts between intrastate rates prescribed by state commissions and interstate rates prescribed by this commission. It there recommended legislation to provide a legal basis for the co-operation thought desirable as being in the interest of uniform and efficient regulation from the point of view of the carriers and the public. With the view of promoting this kind of co-operative action hearings have been held in a half dozen different states, which were in fact, although not in law, joint hearings of the interstate and the respective state commissions. In one instance these hearings extended through many weeks, and while the controversies in question have not yet been disposed of, the commission believes that what has already been accomplished has been distinctly in the interest of all the affected parties, and that a proper basis has been laid for final disposition of questions which have vexed the citizens and authorities of the respective states as well as the carriers operating under these conditions, so that it will be possible to carry these proceedings to a final conclusion with substantial harmony of action on the part of the respective authorities.

The suggestion for legislation received the unanimous endorsement of the National Association of Railway Commissioners at its last annual convention. By resolution a committee was "directed to confer and co-operate with members of the Interstate Commerce Commission in bringing said matter before the federal Congress, with the view of securing the necessary statutory authority for effective co-operation between the Interstate Commerce Commission and the regulatory commissions of the several states." The committee representing state commissions is co-operating with a similar committee representing the Interstate Commerce Commission in the preparation of a draft of a proposed bill.

ENLARGEMENT AND SUBDIVISION OF THE COMMISSION

Since the last annual report the membership of the commission has been increased from seven to nine, and it has been authorized by law to act through subdivisions.

It is now working under this plan, by which rate cases, except such as have been reserved for consideration by the commission as a whole, are assigned, considered, and dis-

posed of by these respective divisions in monthly rotation. While one division is sitting in arguments, the other two divisions are occupied in finally disposing of submitted cases and in performing the other duties which daily come before it. By means of a series of rules relating to internal organization the commission has provided for the fullest possible co-operation among all the members of the commission and the respective divisions. Each member is kept informed with respect to the action of each division as well as of the whole commission. Conferences of the entire commission will continue to be held periodically, and in the entire reorganization it is keeping constantly before it the desirability and necessity of harmony and uniformity in all its activities. It believes that the relief which this statute was intended to afford to the commission will be realized without sacrifice of uniformity and with an increase in efficiency and gain in speed of action.

The larger subdivisions of the organization have heretofore been known as divisions, such as the division of tariffs, division of accounts, etc. Because of the statutory designation of "divisions" of the commission the name of the respective subordinate units has been changed from division to bureau.

RECAPITULATION OF RECOMMENDATIONS PREVIOUSLY MADE

For the reasons stated in previous reports the commission renews its recommendations to the effect—

That appropriate provision be made for punishment of any attempt, by intimidation, threats, inducements, or otherwise, to influence the testimony of any witness before the commission or to deter him from testifying; as also for punishment of misbehavior, disorderly conduct, or contumacy, in or about any proceeding before the commission.

That the Congress fix a limit of three years within which a carrier may bring action for recovery of any part of its charges, and amend section 16 of the act so as to provide that if the carrier begins such action after expiration of the two-year limit now prescribed in that section, or within 90 days before such expiration, complaint against the carrier for the recovery of damages may be filed with the commission within 90 days after such action shall have been begun by the carrier, and not after.

That without abdication of any federal authority to finally control questions affecting interstate and foreign commerce, the commission be expressly authorized to co-operate with state commissions in efforts to reconcile upon a single record the conflicts between the state and the interstate rates.

That the portion of section 20 of the act which accords the commission right of access to the accounts, records, and memoranda kept by carriers be amended so as to also accord right of access to the carriers' correspondence files.

That there should be appropriate and adequate legislation upon the subject of control over railway capitalization.

That the use of steel cars in passenger-train service be required, and that the use in passenger trains of wooden cars between or in front of steel cars be prohibited.

That under the Panama canal act the commission be empowered to permit, subject to further order of the commission, continued operation by a railway or under railway control of water lines or vessels where it will be in the interest of the people and of convenience to the public, even though such operation may reduce competition on the route by water.

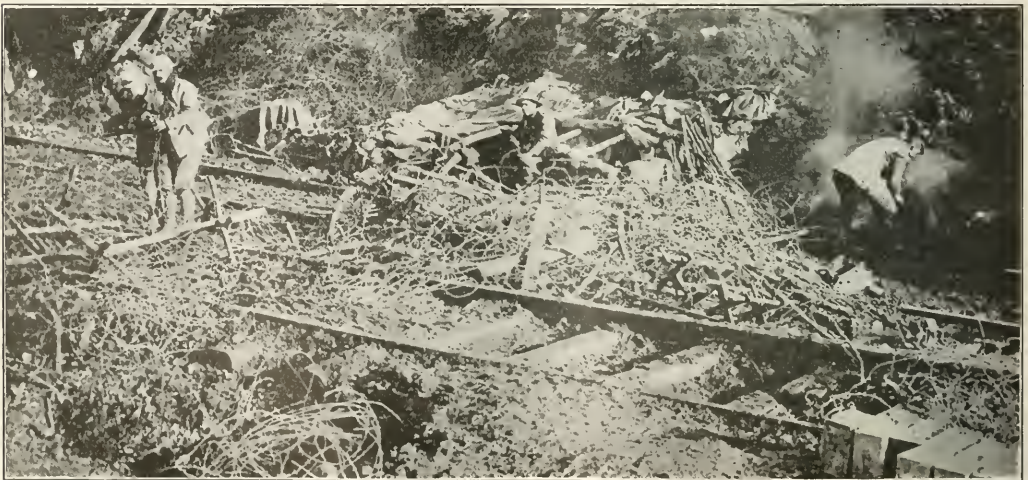
The legislation requiring standardization of railroad operating rules be enacted.

That Congress consider the advisability of prohibiting by statute, under appropriate penalty, trespasses on the trains and on tracks of interstate carriers at places where there are two or more tracks, or within the limits of incorporated towns, or at places where the carrier by appropriate sign or warning gives notice that trespassing on its tracks is prohibited, providing that nothing therein is to be considered as making lawful any trespass which would be unlawful under state laws; and further consider the advisability of conferring concurrent jurisdiction upon federal and state courts for the enforcement of such statute.

From appropriations amounting to \$5,400,000 for the fiscal year ending June 30, 1917, the commission expended the following amounts:

As salaries to commissioners and secretary.....	\$73,916.66
All other authorized expenditures.....	1,087,614.91
Examination of accounts, act approved June 29, 1906.....	297,125.33
Locomotive inspection, act approved February 17, 1911.....	213,954.59
Safety appliance, block signal, and hours of service.....	235,674.30
Valuation	3,289,833.91
	<hr/>
	\$5,182,169.70

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Reopening Railroads in Wake of German Retreat. The Tommies Are Clearing Away a Barrier the Retreating Germans Had Thrown Across the Railroad

Eastern Operating Committee Issues Its First Orders

**Traffic Diverted from Pittsburgh Gateway—Broadway
Limited Discontinued—Embargo on Export Steel**

THE General Operating Committee for the eastern railroads, of which A. W. Thompson, vice-president of the Baltimore & Ohio, is chairman, and which was appointed to deal with the problems created by the congestion of the eastern lines under the plan of pooling their facilities, lost no time in taking vigorous action to effect an improvement in the situation. Its first meeting at its Pittsburgh headquarters was held on November 28. As a result of this meeting, the committee issued the following orders:

That all lines reaching the eastern Atlantic seaboard issue an embargo, effective immediately, on all export steel, billets, bars, plates, or scrap and pig iron, except for the United States Government, and that all existing permits be cancelled; no permits to be issued for these articles except by specific authority of the committee.

That all freight, including livestock and perishable, from Chicago and St. Louis and points west thereof, eastbound, and from Boston, New York, Philadelphia and Baltimore westbound, passing through the Pittsburgh gateway be embargoed and diverted to lines north and south.

That the Pennsylvania 20-hour train known as the Broadway Limited be discontinued effective on December 1 until further notice in order to give greater opportunity for the use of existing facilities for freight traffic through Pittsburgh territory.

That in order to conserve power and transportation capacity required for war essentials, the movement of freight traffic on fast or reduced tonnage rating be suspended and that all such freight be hereafter operated on full tonnage continuous movement schedules.

That only box and stock cars may be furnished for team track loading of coal.

PLANS FOR CO-OPERATION WITH ALLIES

The reason for the export embargo was given in a resolution adopted by the committee, stating that there was stored on the ground and in cars at northern Atlantic ports 1,325,000 tons of steel and iron immediately available for movement overseas; that it is vitally essential that there be thorough co-operation in the handling of traffic for overseas shipment so that the railway equipment which would otherwise be available for coal or coke shall not be used in moving traffic which cannot be promptly trans-shipped when it reaches tidewater, and that a representative of the committee be named with headquarters in New York for co-operation with the representatives of the Allies to the end that rail transportation be limited to that traffic for which overseas transportation is available.

The committee also held a session on Thanksgiving Day and arranged for a committee on overseas traffic consisting of one representative each for Boston, New York, Philadelphia, Baltimore and Norfolk. This committee is called the "Export Division of the General Operating Committee of the Eastern Railroads" and it will sit regularly at New York city (165 Broadway). It will at once exercise control over the entire export traffic in iron and steel (unmanufactured), including billets, bars, plates, scrap and pig iron (except for the United States Government). Ultimately it will direct all overseas traffic of the eastern railroads, not only in iron and steel, but of all other descriptions, including that of the United States Government (with the approval of the Federal authorities). George D. Ogden, freight traffic manager of the Pennsylvania, is chairman, and the other members are: R. Van Ummersen, general freight agent of the Boston &

Albany; F. La Bau, traffic manager of the New York Central; Robert L. Russell, general freight agent of the Philadelphia & Reading; Archibald Fries, freight traffic manager of the Baltimore & Ohio; E. D. Hotchkiss, freight traffic manager of the Chesapeake & Ohio, and J. R. Ruffin, freight traffic manager, of the Norfolk & Western. All these will be relieved from their ordinary duties. The export division will co-operate with the agents of the Allied powers and the United States Government.

REGULATIONS IN DETAIL

On account of the fundamental importance of the free movement of traffic for and through Pittsburgh, the order to divert traffic through that gateway was amplified to provide that all freight westbound from New England, New York, Philadelphia, Baltimore, Harrisburg and intermediate points be embargoed and diverted to northern routes.

The committee also began a thorough study of the situation confronting it and requested the presidents of all eastern roads to advise promptly by wire of any serious congestion or accumulation which results in or threatens a reduction in efficiency or capacity of the transportation plan.

Each railroad in eastern territory was also called upon to make an immediate study of the possibility of securing greater efficiency by a rearrangement of engine and train crew runs by the utilization jointly of the track and terminal facilities of two or more companies, and that, wherever found practicable, an effort be made to secure the inauguration of this plan. An order was issued that each railroad take immediate action to eliminate any existing cross haul or indirect routing of freight traffic and that a report be made to the committee of any such cross haul or indirect routing which cannot be and is not connected by individual railroad action.

SPECIAL ATTENTION TO PITTSBURGH DISTRICT

On November 30, for the purpose of conserving transportation facilities in the Pittsburgh switching district, and aiding iron and steel industries manufacturing war materials to keep in continuous operation, the Pittsburgh district committee of the Commission on Car Service was instructed to place an embargo on all carload freight originating and terminating within the Pittsburgh switching limits, as well as on less than carload freight between points within its limits. The Pittsburgh district committee was authorized to issue permits for carload freight consisting of raw material or semi-finished products used in the manufacture of commodities for war purposes.

Owing to the shortage of labor and the urgent necessity of conserving railroad equipment and track facilities, the Pittsburgh committee was also directed to place an embargo on all shipments of slag and refuse from iron and steel industries non-self-contained. The committee was authorized to issue permits itself for the modification of this embargo.

Finding that United States troops had in some instances been routed over railroads where freight congestion exists, the committee requested the Railroads' War Board to require its representatives in charge of routing troops to keep in close touch with the General Operating Committee and to co-operate with it to avoid such congestion.

In order to prevent the cross-hauling of coal, the commissioner of the Lake Erie Bituminous Coal Exchange was directed to formulate plans for shipping and locating pools to facilitate the all-rail transportation and distribution of coal

to the west and north, all local organizations to become a part of such general pooling arrangements under the direction of the commissioner of the lake coal and ore traffic.

SUB-COMMITTEE AT CUMBERLAND

For conducting the work of the committee on lines east of Pittsburgh and Parkersburg, a sub-committee was appointed to meet immediately at Cumberland, Md., to secure information covering the exact transportation situation throughout its territory and to put into effect measures for immediate relief of congested points, keeping the general operating committee constantly advised and paying particular attention to government freight and the movement of raw materials for blast furnaces. F. E. Blaser, assistant general manager of the Baltimore & Ohio, was appointed chairman of this sub-committee. C. R. Gray, president of the Western Maryland, a member of the General Operating Committee, was assigned to this sub-division.

On account of the large accumulation of coal at Cumbo and Cherry Run and on account of the unusually heavy deliveries by the Norfolk & Western to both the Cumberland Valley and the Western Maryland at Hagerstown, the Baltimore & Ohio was ordered to deliver to the Western Maryland and Cumberland Valley three large freight engines each and the Norfolk & Western was instructed to deliver them two large freight engines each to be held until the congestion of freight via the Harrisburg gateway is relieved, or until further notice.

The embargo order on traffic through the Pittsburgh gateway was further modified to provide that it shall not apply to livestock, perishable freight and foodstuffs for human, animal and poultry consumption for destinations which cannot be reached except by lines operating through the Pittsburgh gateway.

THE STRIKE OF A. C. L. CLERKS

The Atlantic Coast Line, to settle the controversy with its striking clerks, decided on Wednesday, November 28, to take them all back notwithstanding the grave injustice which this would work on loyal men who had come to the aid of the company; this at the request of President Wilson. President J. R. Kenly has issued a circular recounting the negotiations with the government at Washington. He says that only 23 per cent of the clerks employed by the company left the service, and that the positions vacated were rapidly and satisfactorily filled.

The circular says that the movement to form the clerks of the company into a union followed the dismissal of a clerk at a Richmond freight office on October 16 on account of unsatisfactory service. Of the clerks at that agency, 36 struck; and during the 30 days following approximately 445 clerks altogether left their work, most of them without notice; and this affected 30 stations. The federal Department of Labor sent a conciliator to the company and, after conferences at Washington with L. F. Post, assistant secretary of labor, and with W. B. Hale, member of one of the committees of the Council of National Defense, a form of agreement was drawn up which, it appears, satisfied the representatives of the government and the railroad, but it seems that it did not satisfy the strikers. After a day or two the government officers reopened the question.

The principal feature of the proposed agreement was that, for the period of the war, the road should abandon its policy of employing no clerks belonging to a union, and that the strikers would be taken back so far as their places had not been filled in a satisfactory manner by new employees. This last was modified to an offer to take back 75 per cent of the men. The agreement with the Department of Labor was drawn up on November 17; there was a conference between the government, the railroads and the strikers in Wilming-

ton, November 22 and 23, and the road again laid the matter before the Department of Labor in a long letter. This letter called attention to the highly incensed state of mind of the loyal clerks, 1,500 or more, who had endured insults and annoyances during the early period of the strike, and who objected to the restoration of the 400 strikers.

The only response, according to the circular, to this statement of November 23 was a telegram from the White House, November 24, asking that as a means of strengthening the confidence of the wage earners of the United States in the good will of employers the company take back all of the strikers who wished to return to their former positions. Mr. Kenly replied to President Wilson that he would yield, if the request were insisted on, but that he felt that the President's suggestion would entail unfortunate results. To take back all of the strikers would impose a grave injustice on the loyal men who had enabled the road to continue its operation uninterruptedly. He asked for opportunity to present the situation to President Wilson in person. On the 27th, the President renewed his request saying, in substance, that his familiarity with the general labor situation in the country was such as to warrant him in placing the special circumstances of the Atlantic Coast Line secondary. President Kenly, then, in deference to the President of the United States, complied with his request.



Photograph from Kadel & Herbirt, N. Y.

So Well Camouflaged That It Almost Spoils the Picture. An Armored Car Used by the French on the Aisne Front. The Gun Operates on a Turret. Its Being Mounted on Railway Trucks Permits of Its Being Readily Moved From One Part of the Battle Front to Another.

OBDUKATE STATES.—How could the Government help the railways more than by letting the States know, for instance, that they could impose "full crews" upon State commerce, but they could not do so to the detriment of national trade? That is a small but heinous and recent example, which shows the obduracy of the States regarding national welfare of the railways.—*New York Times.*

THE VOLUNTARY RELIEF DEPARTMENT of the Pennsylvania Lines West of Pittsburgh, in its 28th annual report, shows the following disbursements for the year ended June 30, 1917: Benefits for accidental deaths, \$78,750; natural deaths, \$273,789; disability through accidents, \$237,482; disability through sickness, \$453,011; operating expenses, \$140,836. The number of accidental deaths was 101; natural deaths, 420; disablement through accidents, 11,363; disablement through sickness, 12,420; total cases of death and disablement, 24,304.

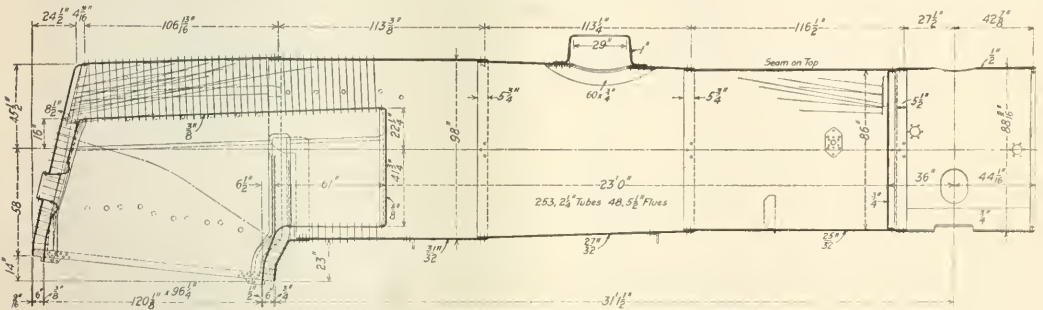
Locomotives of the 2-10-2 Type for the Wabash

Haul 5,000 Tons Over 0.4 Per Cent Grades; Large Boilers Make Possible High Sustained Capacity

THE Wabash has recently received 25 large 2-10-2 type locomotives from the American Locomotive Company. These engines have replaced others of the Mikado type on the Decatur division between St. Louis, Mo., and Chicago. On this division the heaviest traffic is in the north-bound direction, against which the ruling grade is .4 per cent, with the longest single grade four miles in length. The average train load for the 2-10-2 type locomotives north-bound is 5,000 tons, as compared with 3,500 tons for the Mikado type locomotives previously in service in the same territory. This is an increase for the 2-10-2 type of 42.8

per cent has been obtained and the train load has been increased 42.8 per cent.

As a rule, an increase in weight results in a proportionately greater increase in tractive effort. In this case, however, the percentage increase in weight and tractive effort are approximately the same because of the particular attention which has been given to the proportioning of the boiler. It is of the extended wagon top type with an outside diameter at the first barrel course of 87 9/16 in. The largest barrel course has an outside diameter of 98 in. The boiler is fitted with 253 tubes, 2 1/4 in. in diameter, and 48 superheater flues,



Longitudinal Section of the Wabash 2-10-2 Type Boiler

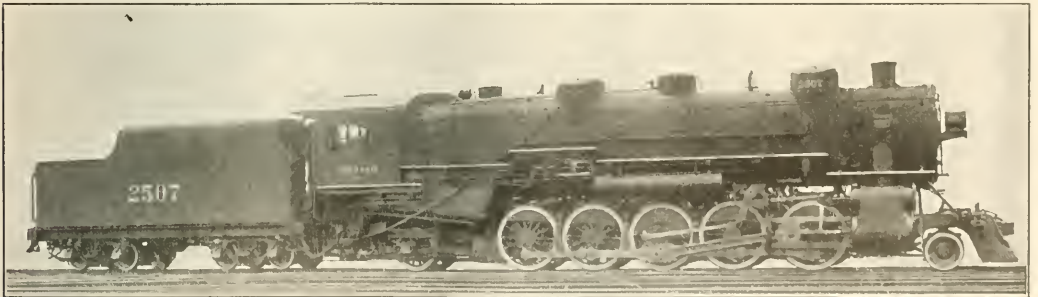
per cent in tonnage and a decrease of 30 per cent in train mileage has thereby been effected. These locomotives have been used on troop trains with very satisfactory results, hauling as many as 30 cars at speeds of 35 miles an hour. The exceptionally large boilers and the mechanical stokers with which the locomotives are equipped have made this high sustained capacity possible of attainment.

The new locomotives have cylinders 29 in. by 32 in. and

5 1/2 in. in diameter. The length between tube sheets is 23 ft.

The firebox has a grate area of 80.2 sq. ft. and is fired by the Street Duplex stoker. It is 120 1/8 in. long and 96 1/4 in. wide and is fitted with a Security brick arch carried on five arch tubes.

The heating surface of the firebox and arch tubes is 379 sq. ft. and the total evaporative heating surface of the boiler

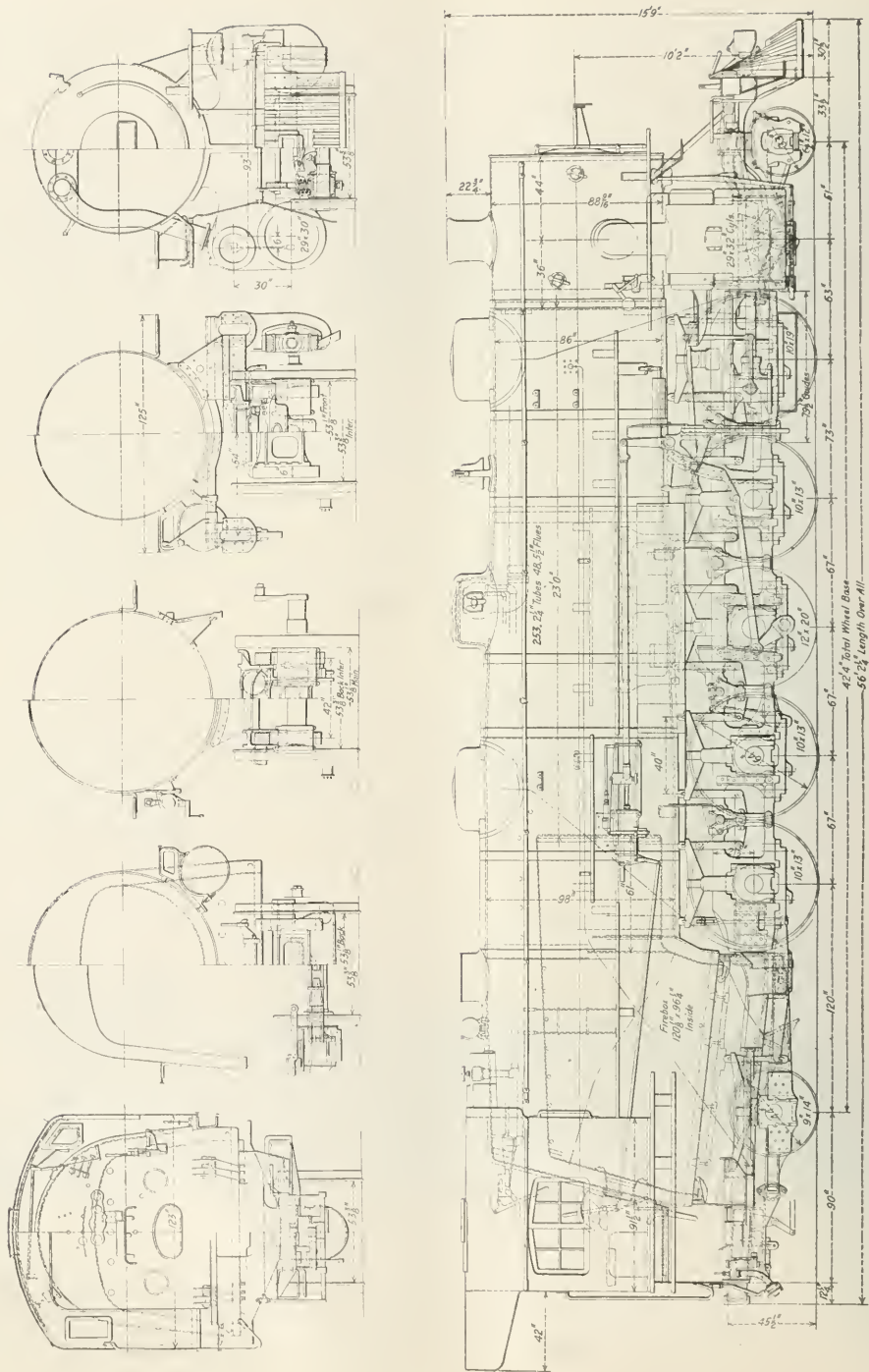


Large 2-10-2 Type Locomotive for the Wabash

a tractive effort of 69,700 lb., with driving wheels 64 in. in diameter. The total weight of the engine and tender is 591,900 lb. The Mikado type locomotives displaced by the new engines, have cylinders 26 in. in diameter by 30 in. stroke and a tractive effort of 50,360 lb. The total weight of engine and tender is 423,800 lb. With an increase in total weight of 39.6 per cent, an increase in tractive effort

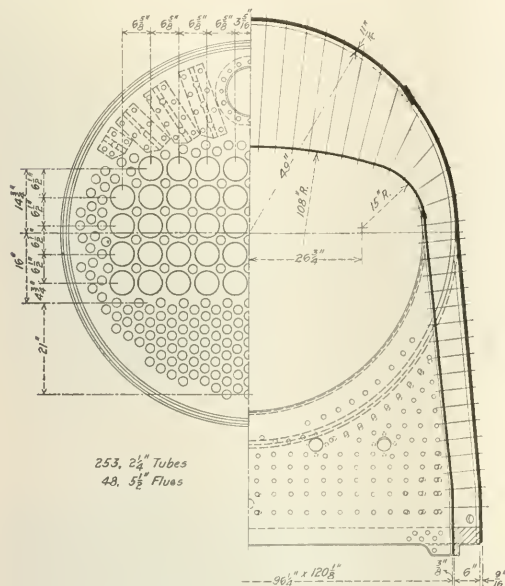
is 5,370 sq. ft. The superheater has 48 elements and a heating surface of 1,129 sq. ft.

According to Cole's ratios, a superheater locomotive having 29-in. cylinders and operating with 195 lb. boiler pressure produces a maximum cylinder horsepower of 2,954 at a piston speed of about 1,000 ft. per minute. On the assumption that each horsepower requires 20.8 lb. of super-



General Drawing of the Wabash 2-10-2 Type Locomotive

heated steam per hour, this locomotive working at maximum capacity requires 61,443 lb. of steam per hour. In accordance with the equated values of heating surface used in Cole's ratios, the firebox, combustion chamber and firebox



Tube Sheet and Cross-Section Through the Firebox

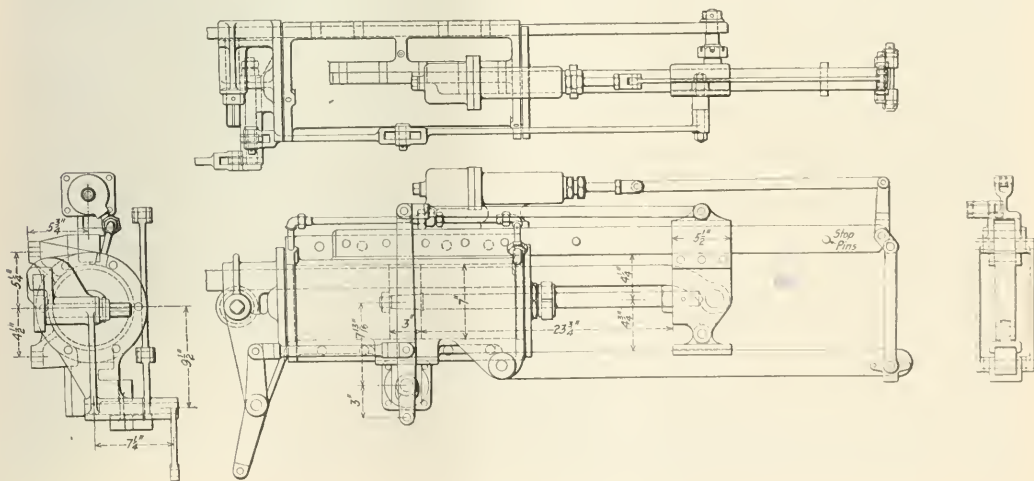
water tubes are rated at 55 lb. of steam per square foot of heating surface per hour. Tubes $2\frac{1}{4}$ in. in diameter and 23 ft. long with $\frac{3}{4}$ -in. clear spacing will evaporate 8.03 lb., and the flues $5\frac{1}{2}$ in. in diameter, having the same clear

The cylinders are of cast iron and both the cylinders and valve chambers are bushed. The back cylinder heads are of cast steel, while the front heads are of cast iron. Steam is distributed by piston valves 14 in. in diameter which are controlled by the Walschaert valve gear.

The power reverse gear is the latest type of Mellin reverse gear, furnished by the American Locomotive Company. This gear is provided with a friction clamp locking device which is actuated by a spring. One of the illustrations shows the gear as it is applied to the Wabash locomotive. The reverse lever connecting rod is attached to the lower end of the rocker arm shown at the left end of the cylinder, while the reach rod is coupled to the crosshead. The gear is operated by means of a rotary valve located below the middle portion of the cylinder; the lapping of the valve is accomplished in the usual manner by a combination lever connected at the upper end with the crosshead of the reverse gear cylinder. At the left end of the cylinder is a rack and pinion device for moving the gear when air pressure is not available.

It will be seen that the crosshead operates on a single bar guide attached to the top of the cylinder. Below the crosshead is a hinged bar connected at the outer end to the fixed guidebar by means of a bell crank and link. The locking of the gear is effected by a spring which, acting through the medium of the bell crank, causes the crosshead to be tightly gripped between the guidebar above and the hinged bar below. The clamping device is so designed that the pressure gripping the crosshead is about eight times the working capacity of the crosshead. When the reverse lever is moved, the clamp is released by means of a small pressure cylinder located in the rear of the spring cage. Through an automatic shifting valve pressure is admitted to this cylinder whenever air is admitted to either end of the operating cylinder. At the completion of the desired motion of the piston in the cylinder, the crosshead is again clamped in position by the release of the air pressure acting against the clamping spring.

The locomotives are fitted with the Woodard engine truck



The Mellin Power Reverse Gear

spacing will evaporate 9.18 lb. of steam per square foot of heating surface per hour. Using these values for the various evaporating heating surfaces, the maximum evaporation is estimated at 62,791 lb. of steam per hour, or 102 per cent of the actual maximum requirement.

and the Cole trailing truck, under a Commonwealth Steel Company's cradle casting. This casting combines the two rear frame slabs, footplate, trailing truck spring yoke brackets, and the trailing truck radius bar fulcrum.

The leading driving axle is fitted with lateral motion driv-

ing boxes and the main axle with long main driving boxes. Among other specialties with which the locomotives are fitted, are the Woodard throttle valve, Radial buffers and Fouldler solid back end main rods.

The principal data and dimensions are as follows:

General Data

Gage	4 ft. 8½ in.
Service	Freight
Fuel	Bit. coal
Tractive effort	69,700 lb
Weight in working order	395,000 lb
Weight on drivers	314,000 lb
Weight on leading truck	28,500 lb
Weight on trailing truck	52,500 lb
Weight of engine and tender in working order	591,000 lb
Wheel base, rigid	16 ft. 9 in.
Wheel base, driving	22 ft. 10 in.
Wheel base, total	42 ft. 4 in.
Wheel base, engine and tender	78 ft. 4¼ in.

Ratios

Weight on drivers ÷ tractive effort	4.5
Total weight ÷ tractive effort	5.7
Tractive effort × diam. drivers ÷ equivalent heating surface*	648.1
Equivalent heating surface* ÷ grate area	85.3
Firebox heating surface ÷ equivalent heating surface, per cent.	5.5
Weight on drivers ÷ equivalent heating surface*	45.6
Total weight ÷ equivalent heating surface*	57.4
Volume both cylinders	24.5 cu. ft.
Equivalent heating surface* ÷ vol. cylinders	281.4
Grate area ÷ vol. cylinders	3.3

Cylinders

Kind	Simple
Diameter and stroke	29 in. by 32 in

Kind	Water	Piston
Diameter	10 in.	14 in.
Greatest travel	7 in.	7 in.
Wheels		
Driving, diameter	64 in.	
Driving, thickness of tires	4 in.	
Driving journals, main, diameter and length	12 in. by 10 in	
Driving journals, others, diameter and length	10 in. by 13 in	
Engine truck wheels, diameter	33 in.	
Engine truck, journals	6 in. by 12 in	
Trailing truck wheels, diameter	44 in.	
Trailing truck, journals	9 in. by 14 in	
Boiler		
Style	E. W. T.	
Working pressure	195 lb. per sq. in.	
Outside diameter of first ring	87 9/16 in.	
Firebox, length and width	120¼ in. by 96¼ in.	
Firebox plates, thickness	Crown, sides and back ¾ in.; tube, ¾ in.	
Firebox, water space	6 in.	
Tubes, number and outside diameter	253—2¼ in.	
Tubes and flues, length	48—3½ in.	
Heating surface, tubes and flues	23 ft.	
Heating surface, firebox, including arch tubes	4,901 sq. ft.	
Heating surface, total	379 sq. ft.	
Superheater heating surface	5,370 sq. ft.	
Equivalent heating surface*	1,129 sq. ft.	
Grate area	6,883 sq. ft.	
Tender		
Water bottom	Cast steel	
Frame	196,000 lb.	
Weight	33 in.	
Wheels, diameter	6 in. by 11 in	
Journals, diameter and length	10,000 gal.	
Water capacity	18 tons	
Coal capacity		

* Equivalent heating surface = total evaporative heating surface ÷ 1.5 times the superheating surface.



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Looking Down from an Aeroplane on the 400 Millimeter French Railway Guns

Huge 400 millimeter guns mounted on specially constructed cars, just arriving at the front. These guns, of long distance ranges, are used to destroy the German entrenchments and forces in the rear lines, while the smaller calibred guns, such as the famous 75s, are used on the front-line trenches of the enemy. These giant guns are operated from the cars on which they are mounted, running on strategic railway lines behind the first-line trenches.



An American Railway Freight Station in the Hills of France. Copyright by Committee on Public Information, From Underwood & Underwood, N. Y.

Railwaymen Get Into Fight at Cambrai

American Engineers Caught Between the Lines Take Up Arms and Win Praise of British Commanders

"THE courageous conduct of a number of American soldiers attracted much attention. They were pioneers and specialists engaged in construction and working on field railroads. When the enemy appeared Friday morning, they exchanged their shovels for rifles and cartridges and fought alongside the Tommies. Several fell gloriously with arms in their hands facing the foe. No man who saw them at work but praises glowingly the coolness, discipline and courage of these improvised fighters." Thus the Havas correspondent at the British front, describing the formidable German attacks before Cambrai on Friday, speaks of the way the American railway engineers behind the British front before Cambrai jumped in to help against the Germans' terrific counter attacks beginning Friday last.

The Associated Press despatches on Saturday, Sunday and Monday featured the work of the American engineers. The first despatch on Saturday told how the engineers were caught between the British and German lines:

"Large numbers of American army engineers working on the British railways in the region of Gouzeaucourt, caught in the German turning movement, escaped by lying in shell holes and prone upon the ground while the British fired over them.

"There they remained until the British were near enough to enable the Americans to join the ranks, when they fought valiantly and played an important part in replying to the enemy.

"The British commanders refer to their gallant behavior with the greatest enthusiasm.

"Americans elsewhere took a busy hand in the fighting and were under hot German shell fire. Numbers of them volunteered for patrol work in the danger zone, and all acquitted themselves finely.

"A British general told the correspondent that he could not praise them too highly. It is reported that several

Americans were captured, but escaped after a few hours and rejoined the British.

"The crew of a train had a narrow escape. The engine driver, who hails from St. Louis, was standing beside his engine talking with a British soldier when the attack started. A shell struck nearby and killed the Briton, but the American escaped.

"Two more shells exploded on either side of the locomotive, and he and the crew 'dug themselves in' in shell holes, and after many hours made their escape. The railway was blown up by the Germans shortly after the Americans hid themselves.

"The engineers were mainly from New York."

An Associated Press correspondent also cabled that he could "recall no previous time when army engineers have undergone such varied and thrilling experiences as yesterday. The latest reports say that several Americans who were actually captured by the Germans escaped after a few hours and made their way back to the British line.

"How many of them spent agonizing hours lying in shell holes with the enemy all about it is impossible to state, but there were a large number."

PROBABLY MEN OF THE 11TH ENGINEERS

The railways engineers who were in the battle were probably members of the 11th Railway Engineers recruited in New York. Their colonel is G. M. Hoffman, a regular army engineer and William Barclay Parsons, a noted New York public service engineer, is now lieutenant colonel. When the regiment was organized, Charles H. McKinstry, a regular army officer, was its colonel, but he has since been promoted to the rank of brigadier-general.

ENGINEERS HELPED IN BRITISH DRIVE AT CAMBRAI

The American railway engineers have been at work behind the British front for sometime. An Associated Press

despatch from the American Army Headquarters in France dated November 28 said:

"American troops have played an important part in General Byng's drive before Cambrai. It is now possible to tell the people of the United States for the first time that American army engineers have had a large hand in the marvelous work which has been accomplished in the way of pushing the vital railways up to the front. The engineers have been laboring on the roads, behind the British lines for nearly four months, and two of the men who were wounded were the first American casualties announced from Washington. The military requirements have made it impossible to mention their presence here before this time.

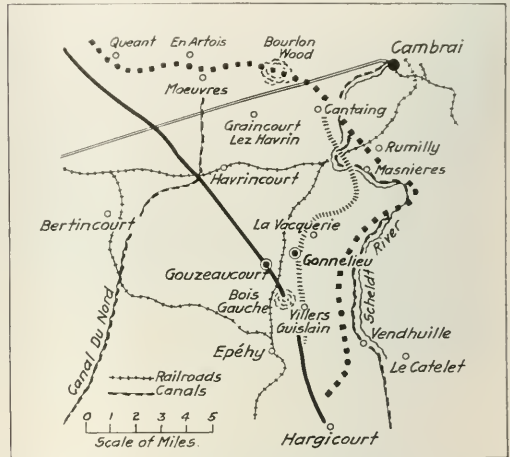
"The speed with which the lines have been laid up through the broken Hindenburg defences during the past week has called forth the highest praise from the British authorities. The Americans have been working in shifts twenty-four hours a day, and no such amount of track has been laid in this region in so short a time before. The manner in which they stood up under the strain has led to their being dubbed the 'force of American athletes,' for these untiring soldiers today are as fit and as willing as they were before the battle began.

"The Americans have for a long time been working under the range of enemy artillery and more than once they have come under heavy shell fire. One of the most striking sights along the front has been that of the engineers laboring coolly at their tracks while great shells were bursting a hundred yards away.

"At one time the Germans cut loose with their guns on a section of the tracks and tore up three miles of rails which had been laid with much labor but they scarcely had finished this bombardment when the twin lines of steel began to creep forward once more. After the engineers had reached a point where they were exposed on the skyline, it was necessary to work at night or on foggy days in order to avoid enemy observation.

"There have been three forces of Americans employed in this region since about August 1. Two of them have been

"The correspondent was talking with three officers today and the only anxiety they expressed about the future was the fear that they might later be compelled to work far back of the lines out of the fighting zone. The engineers love to hear the guns and to get so close to the firing line as military or-



The Salient at Cambrai. The Full Black Line Shows the Original British Position; the Dotted Line the Position Gained After the British Surprise Attack and the Shaded Line Approximately the Ground Regained by the Germans. The Americans Were Engaged at Work Near Gouzeaucourt and Gonnelleu.

ders permit. Some of them had an unusual experience, much to their liking, on the first day of the offensive. The British



British Official Photograph from Underwood & Underwood, N. Y.

A British Engineer Company Following Up a German Retreat

occupied with the operation and maintenance of light railways and the other has been constructing narrow gage lines, over which food, ammunition and material of all sorts are poured to lend support to the fighting forces.

"The correspondent has visited many of these engineers since their arrival and has found them as fit as possible and eager for work. Most of them undoubtedly look forward to the time when they will be able to join the American forces, but just now they are content to do their bit here and to learn valuable lessons in military railroading.

called for volunteer stretcher bearers to go forward to the battlefield and bring in wounded British and Germans, and a large number of the engineers offered their services, which were accepted. They just had finished a hard day's work on the railway, but they gladly undertook the new, arduous and dangerous task and labored through the night getting injured soldiers back to the dressing stations. They were highly complimented by the British for their efficiency in this line of service which was rather a far reach from building railroads."

Railway Problem Viewed From Washington

Government Operation Is Not Desirable; Congestion Is Confined to the East; Question of Priority Shipments

WASHINGTON, December 4, 1917.

THE announcement by the Railroads' War Board of the plan for pooling the facilities of the eastern railroads to the extent necessary to secure a maximum of transportation has aroused a flood of discussion in Washington as to whether it will prove sufficiently effective to prevent a more direct control of railway operations by the government. While much of the prominence given to the idea of government operation may be ascribed to the fact that any possibility of such a radical step is a better newspaper story than any action to be carried out by the railroads themselves, it is also evident that the idea has been persistently cultivated in certain quarters in Washington.

As far as can be learned, there is no great desire on the part of responsible officers of the administration to assume the enormous burden of responsibility that would be involved in the operation of the railroads in addition to the many tasks with which it is now confronted. After the cabinet meeting last week it was reported that the railroad plan had been discussed but that the sentiment was that the government should not attempt to interfere unless it should appear certain that the railroads could not solve the problem themselves. It is not at all difficult, however, for a newspaper correspondent to obtain during a brief call at the office of the Fuel Administration sufficient authority for a statement that the question of the necessity for the government taking over the railroads "is being considered in government circles." Moreover, it is much easier for the Fuel Administration to explain to newspaper men that there would be plenty of coal if the railroads would only furnish enough cars and handle it promptly than it is to explain *all* of the reasons why more coal has not been produced.

The prevailing peculiar psychology as to the powers and capacity of a government seems to lead the same people who criticize almost everything the government has done to assume that any new undertaking of the government in the future will function like clock-work. Under this kind of reasoning, as soon as the railroads admitted that they might not be able to meet all the demands for transportation this winter, there came a general renewal of the suggestion that the government should operate them.

Railroad executives have expressed the opinion that under the plan adopted they can serve the government as well as if they were wearing uniforms, but the opinion has been expressed in some quarters that they would succeed much better if directed by a government transportation director "who knows no more about railroading than Dr. Garfield knows about coal," as one writer put it. The same correspondent said that Dr. Garfield's "success" has been attributed to the fact that he knows no more about coal than the average man who occasionally tends his own furnace; that he glories in the fact and that the President had appointed him for that reason.

If the country would be satisfied with the kind of success in transportation that Dr. Garfield has demonstrated in increasing the supply of coal, it would not be difficult to find a man in Washington who would fully measure up to these specifications.

PLAN NOT IN VIOLATION OF LAW

The answer to the question frequently raised, as to why the railroads had not adopted a pooling plan before, became evident when Fairfax Harrison, chairman of the Railroads'

War Board, felt called upon to issue a statement on November 29 to explain that the railroads are not contemplating a violation of the anti-pooling section of the commerce law. Mr. Harrison said:

"Various statements have been published to the effect that the plan which the railways have adopted to relieve congestion involves a system of pooling which is in violation of the act to regulate commerce. These statements are incorrect. The law forbids the pooling of freight traffic or earnings by competing railways. Our plan does not involve or contemplate the pooling of either traffic or earnings. We have merely arranged for the use of physical facilities in common at places and to the extent necessary to enlarge sufficiently the capacity of the eastern railroads. If the word 'pool' is applicable, what we have partially pooled are the physical facilities.

"The condition we are dealing with is analogous to the flood situation at Dayton, Ohio, a few years ago. It was impossible for certain railways to handle all the traffic which normally came to them. Therefore, they diverted large amounts to railways which were still open. Similarly at the present time certain railways have become so congested that they cannot handle all of the business which is coming to them, and we are utilizing other railway lines to relieve the situation.

"There is no similarity between these measures and the agreements for the pooling of traffic and earnings which are forbidden by the interstate commerce act."

While numerous government officials have told newspaper men that the laws must be disregarded in times of emergency and that they admired the railroads for having nerve enough to disregard them it is apparent that railroad officers do not feel that they can safely depend on such flimsy assurances of immunity.

CONGESTION CONFINED TO THE EAST

Mr. Harrison has also authorized a statement to explain why unusual methods were necessary for the eastern lines.

"The measures adopted in eastern territory apparently have given many persons an erroneous impression regarding the transportation situation in the country as a whole," he said.

"In the west there is no serious congestion, and the railroads are handling the traffic in as satisfactory a manner as could be expected in view of its very large volume. They are not able to furnish all the cars for which shippers ask, but this is largely due to the detention of cars in eastern territory owing to the congestion there which special measures have been adopted to relieve.

"In the Southeast the railways, without serious trouble or delays, are handling the heaviest business ever known in that territory. They could handle a still larger business and our committee anticipates that the government authorities will adopt the recommendation it has made for immediate measures to transfer movement of foodstuffs and other export material to south Atlantic ports." The Board finds that the congestion in the east has been to a great extent brought about by the excessive use of preference orders for Government freight. This is not due to priority orders issued by Judge Lovett, but to routine preference orders issued by many representatives of the various government departments. The number of these routine preference orders has become so large that on some roads they cover the greater part of the freight. This has increased congestion

in yards by causing a large increase in switching movements. Continuing, Mr. Harrison says:

"A constant flow of traffic concurrently produces the best transportation results. We are therefore emphasizing the desirability of reducing the number of preference orders, which, by causing attempts to give expedited movement to so large a volume of traffic, are slowing down the movement of all traffic and thereby defeating the very object sought. We are assured of the co-operation of representatives of the government as respects this matter."

FOOD AND FUEL ADMINISTRATIONS BOTH ASK PRIORITY

What appeared for a time like a disagreement between the government food and fuel administrations as to the relative importance of food and fuel as entitling them to priority in transportation has since been explained to mean that both want priority only over general freight, but so far Judge Lovett has declined to issue a general order. After a conference with representatives of the National Coal Association on November 28, Dr. H. A. Garfield, the fuel administrator, requested Judge Lovett, priority director, to issue an order giving priority in transportation to all railway movements of coal and coke and empty coal and coke cars over general freight. The coal operators had been importuning him to make this request for some time. On November 30, however, Herbert Hoover, the food administrator, entered a vigorous protest with Judge Lovett against the adoption of any policy that would put any commodity, even coal, ahead of the nation's essential foodstuffs, which, in the opinion of the Food Administration, are first in importance as a national necessity. After Mr. Hoover and Mr. Garfield had lunched together on Saturday it was explained that there was no conflict between them.

The request of the Fuel Administration was made after the coal operators had asserted that the country is facing a fuel famine and that shortage of cars is the most important factor in the situation. They were able to refer to the report of the Geological Survey for the week ended November 17 that the mines had produced only 77.2 per cent of their full time capacity and that 15.3 per cent of the deficiency was attributable to car shortage. In a statement regarding the situation the coal operators said:

"The National Coal Association recognizes that the railroads are congested and crowded with freight far beyond anything ever before experienced by them, but this does not change the fact so far as concerns the fuel conditions. The fact remains that we are face to face with a fuel famine. There is relief in sight only through additional supply of cars to run the mines at full capacity and preferential movement of the coal from the mines to the consumers. Bituminous coal operators will certainly run their mines to the limit of production if they are given the opportunity."

Coal has already received greater consideration both by the government authorities and by the railroad than any other single commodity, although without a government order the railroads have been unable to give it absolute priority. The first order issued by the Railroads' War Board after its organization was a direction to give preference in transportation to coal, coke and iron ore, and three out of the four priority orders issued by Judge Lovett have been for the purpose of promoting the movement of coal.

The requests for priority of food and fuel, as well as the general question of priority, were discussed at a conference between Judge Lovett and other government representatives and the Railroads' War Board on December 1, at which the railroad men objected to any more general priority orders. The question was then discussed by the government's interdepartmental war council on Monday, which referred it back to Judge Lovett, and Judge Lovett decided to consider the matter further before issuing an order. On Tuesday Judge Lovett held a conference with the President and is reported to have told him that general priority orders would only complicate the situation and should not be issued, at

least until the railroads have had further opportunity to demonstrate the results of their new plan.

In priority order No. 2 the use of open-top cars for a considerable list of commodities was prohibited, but no order has been issued confining the cars entirely to coal.

Judge Lovett on November 28 cancelled priority order No. 1, which was issued on August 20 to give preference to the movement of coal via the Great Lakes to the Northwest. At that time it was estimated that the requirements for trans-lake bituminous coal would be over a million tons a week during the remainder of the season of navigation, and special efforts have been devoted to keeping up an average movement that would meet that estimate. It is now believed that the requirement has been met and that any additional coal needed in that territory can be furnished by all-rail shipments. The cancellation order was made effective on November 30 and it will result in making many cars available for shipments to the central industrial section and to New England.

Pending action by Judge Lovett, Dr. Garfield telegraphed to Chairman A. W. Thompson of the operating committee for the eastern lines, asking the committee to consider the advisability of giving preference to fuel shipments without waiting for a general priority order. Mr. Thompson replied expressing entire sympathy with the principle and later telegraphed that the committee had advised all interested lines that preference must be given to coal and coke and empty open cars returning to mines to the fullest possible extent consistent with the relief of terminals and junction points. Upon learning of this, Mr. Hoover filed his protest asserting that the necessity of moving livestock and perishables and corn, oats and animal feed-stuffs must be considered as pre-eminent or large amounts of food would be lost. He also stated that the car shortage is a matter for extreme anxiety, especially with reference to coarse grains.

PREFERRED LIST FOR COAL SHIPMENTS

Instead of establishing a list of non-essential industries for the purpose of shutting off their coal supply, the Fuel Administration has sent to coal producers throughout the country a preferred list of consumers to serve as a guide in filling orders, which definitely requests them to give preference to shipments of coal for government orders, railway fuel, household requirements, public utilities, steel plants, coke ovens and munition plants, for a period of 30 days. Operators in Ohio, Michigan, Kentucky, Illinois, Indiana, Alabama, Tennessee, Colorado, and Oklahoma were requested to give preference to government orders, railway fuel, domestic requirements, public utilities and munitions plants, while those in Pennsylvania and Kentucky were requested to give preference also to steel plants and by-product coke ovens. All those in Virginia and West Virginia were asked to give preference to government orders, railway fuel, tidewater shipments for New England, domestic requirements, public utilities and munition plants. The request was not put in the form of a direct order, but the Fuel Administration expects it to be carried out. A communication was also addressed to state fuel administrators suggesting that attention be directed to opportunities for economy in the use of fuel on electric railways, particularly in the reduction of unnecessary heating.

PRESIDENT POSTPONES RECOMMENDATIONS FOR TRANSPORTATION LEGISLATION

No recommendations regarding the transportation situation were made by President Wilson in his message to Congress on Tuesday, as had been expected in some quarters. "Additional legislation," he said, "may become necessary before the present Congress again adjourns, in order to effect the most efficient co-ordination and operation of the railway and other transportation systems of the country; but to that, I shall, if circumstances should demand, call the attention of the Congress upon another occasion."

A New and Novel System of Vessel Unloading

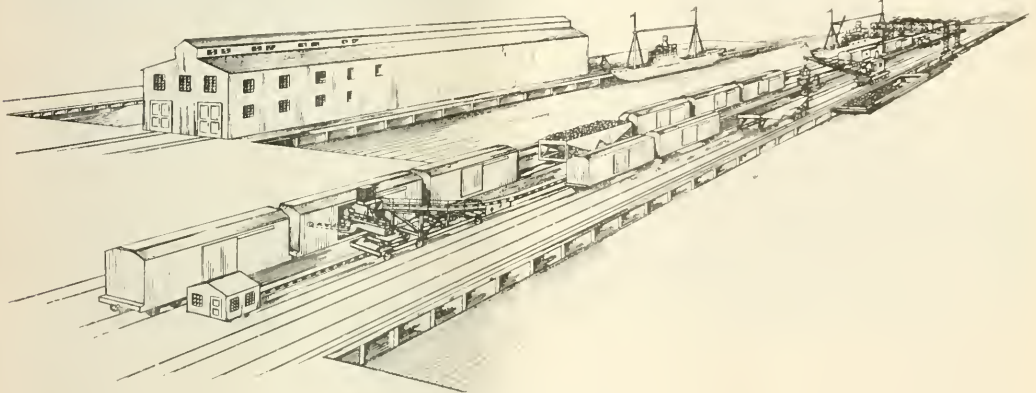
B. & O. Installs Automatic Car Loading Machine
With Electric Weighing Devices on an Open Pier

A NEW and novel system for transferring bulk materials from vessels to cars whereby the usual procedure is reversed and the load is conveyed to the cars instead of requiring the constant attendance of an engine to spot the cars in position to receive the load has recently been installed by the Baltimore & Ohio on pier No. 5 at its Locust Point terminal in the Baltimore harbor. In this way the switching is reduced to a minimum with an appreciable saving in the time of engine crews in addition to releasing the locomotives for other service. The system, which involves an electrically-operated car loader with its belt conveyor and receiving hoppers, was installed to unload ores, sulphur, clays, coal and other bulk materials from the vessels and load them into cars automatically. It loads box or open cars with equal facility. This feature of design is particularly important now because of the acute car shortage as it permits a loaded westbound movement of box cars which previously have been sent light in that direction.

While a pier built to provide three tracks is all that is re-

quired on the center track. The conveyor belt runs through this machine which is motor driven and travels the entire length of the pier. The machine is fitted with a loading arm and an intermediate conveyor between the machine and the arm. The intermediate conveyor is movable in a horizontal plane, having a swing of 270 deg. The loading arm has a horizontal movement through 270 deg. in addition to a vertical movement sufficient to clear the side of the largest open car. With the horizontal movement of the intermediate conveyor it is possible to get the loading arm inside the box car door, and the two movements of the arm permit the load to be placed in any position in the car.

In operation the load may be transferred from the vessel to the hoppers by a gantry, locomotive or ship's crane. The hoppers have a capacity of 20 cu. yd. of materials and each hopper is fitted with a two-speed feeder or conveyor which delivers the materials to the main conveyor which carries them along the pier to the loading machine. By means of this two-speed feeder and an adjustable gate the amount of



Perspective Drawing of the Dock

quired for an installation of this system, there are four tracks on the Locust Point pier. This pier is the open type and is 800 ft. long. It is entirely open to the water on the north and for about 400 ft. on the south. The north, or No. 1 track on the pier is used by cars in loading or unloading materials not suitable for handling through the loading machines and the three remaining tracks are utilized in connection with the conveying system.

The apparatus for this transfer system consists of a receiving hopper, the car loading machine and the conveyor. These are all placed on the center track, leaving the two outside ones on which to place cars the entire length of the pier. The pier affords capacity for 38 cars.

One or more receiving hoppers, mounted on standard trucks and traveling on the center track, can be used with this system. These are so placed as to permit unloading from a number of hatches at one time. The hoppers are motor-driven to allow ready movement from one hatch to the other as may be necessary for unloading the vessels.

The main conveyor, which is a 30-in. belt, extends the entire length of the pier. It is driven by a motor located in a drive house at the land end of the pier. A positive take-up is provided at the water end of the pier to provide for the slack in the belt.

The loading machine is also mounted on trucks and runs

material delivered to the main conveyor is controlled. This feature permits a capacity load to be delivered to the main belt at all times irrespective of the nature of the material and prevents overloading when handling free-flowing materials. From the main belt the materials are delivered to the cars through the loading machine by 20-in. belt conveyors on both the intermediate conveyor and the loading arm.

The operation of the system is electrical and with the exception of the hopper traverse and the speed of the hopper conveyor which must be set at the hopper, it is entirely under the control of one operator in a cabin located on the loading machine. The power is supplied to the system by three wires strung along timber bulkheads which separate the middle track and the conveying apparatus from the outside tracks. A fourth wire interlocks the main belt control and the control on the hoppers. This feature permits starting and shutting down the whole equipment from the operator's cab on the machine.

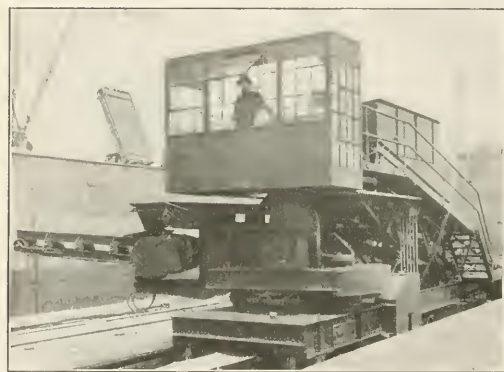
The loader is placed in motion by the closing of a switch in the cabin. By means of a centrifugal control the belts must start in their proper sequence. Those from the intermediate conveyor and the loading machines start first and must reach a certain speed before the main belt can move. The operation can be stopped from any point along the system in case of accident or for any other reason, by wire ropes

which are provided on the bulkheads on either side of the conveyor and which are connected to the main circuit breaker in the drive house. To start again it is necessary to go to the drive house and reset the circuit breaker.

A drum control is provided on the hopper for the traverse and two drum controls on the loading machine, one for the traverse and the other to control the horizontal movement of the intermediate conveyor. The drum control of the hopper is not under the control of the attendant on the machine and must be operated from the hopper itself.

The loading arm is moved to its various positions by hand, the work being done by the man directing the loading of the cars. The horizontal motion is secured by pushing or pulling the arm to the desired position and the vertical movement by a worm, operated through a hand ratchet. The arm is so constructed that the movements are easily made by one man. By this system box cars have been loaded in ten minutes; open or gondola cars may be loaded in less time, governed by the capacity of the unloading facilities.

By means of an electric weighing device which automatically weighs the material moving over the machine, the operator is in absolute control of the car loading. Before loading, the tonnage which shall be delivered to each car is



Head-on View of the Car-Loading Machine Showing the Intermediate Conveyor and the Loading Arm

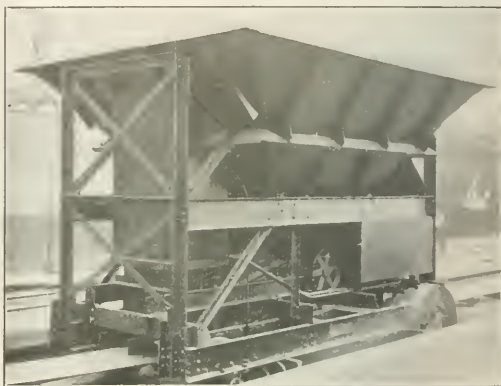
determined; the register is set for one-half this amount by the operator and the loading arm is swung into position to load one end of the car. The conveyors are then set in motion and when the predetermined amount has passed over the machine, a bell is rung automatically as a signal to the operator to stop the operation. The arm is then swung to position to load the other end of the car and the operation proceeds as before. This feature prevents under or overloading of cars and insures a proper distribution of the load over trucks. In addition to this device there is another register which records the total tonnage handled over the system, so that an absolute record of the tonnage is obtained. This weighing device is guaranteed for accuracy to within one-half of one per cent.

The loading capacity of this system is governed by the capacity of the cranes used to unload the ship. The labor saving feature is evinced by the fact that the entire loading operation on the pier can be carried on by two operators.

There was designed as a part of this improvement (but not yet installed) a shuttling-type boom gantry crane for handling not only bulk material, but miscellaneous merchandise freight as well. This gantry is provided with a traverse along the length of the pier with a shuttling movement of the boom, sufficient to allow reaching the off-side of the vessel's hatch, making possible the unloading of boats on either side of the pier.

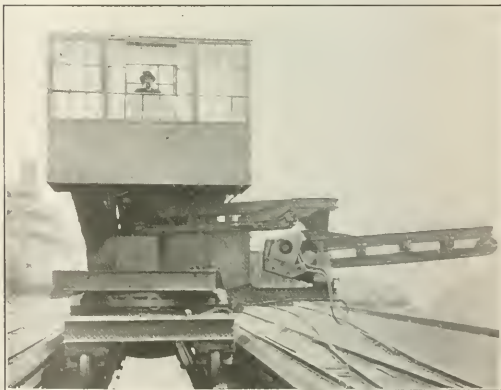
To unload bulk material a clam shell type of bucket would be used, the motor for closing it being built in the head of the bucket, permitting the bucket to be removed, and allow the hoist to be used for the unloading of merchandise or miscellaneous freight. The present unloading operation is carried on by locomotive and ship's cranes.

An important feature of the system is the readiness with



The Receiving Hopper

which it may be installed on existing structures, as any pier of sufficient size and of sufficient strength to carry the locomotives and cars may be utilized. In the installation described above, which is the first of its kind, an existing pier was used and yards already in service provided the storage capacity for the loaded and empty equipment. The main advantages are a reduction in the cost of operation by the replacement of men by mechanical contrivances and entire



Side View of the Car Loader. The Automatic Weighing Device Is Contained Within the Steel Shelter Back of the Operator's Cabin

elimination of the cost of switching engines for spotting cars.

The system was designed and patented by Francis Lee Stuart, president, International Conveyor Corporation, New York, and formerly chief engineer of the Baltimore & Ohio. The Baltimore & Ohio constructed the improvement under the direction of H. A. Lane, chief engineer; M. A. Long, assistant to the chief engineer; W. S. Bouton, engineer of bridges; J. S. Davis, electrical engineer; J. T. Wilson, district engineer, and F. C. Thornley, consulting engineer.

The Depreciation of Railroad Property*

A Clear Exposition on Value and Depreciation, Including a Number of Interesting Original Suggestions

By G. C. Hand

Secretary, Kansas City Southern.

DEPRECIATION and value are facts inseparably related. Depreciation is the subsidence of value. The amount of depreciation is the change which a declining value undergoes in a given interval of time. Intelligent consideration of the subject, or its fruitful discussion, is postponed to a decision of the controversy with respect to value.

VALUATION

Physical value is affirmed by one party and denied by another; commercial value is alleged by the second and disputed by the first: and thus the issue is joined.

Whatever the angle of approach, and whatever the argument advanced, the conclusion is inevitable that value is either physical or commercial, or in part physical and in part commercial. It is necessary to differentiate between the thing valued, which is substantive, and the value assigned, which is attributive.

The commercial and the physical standards of valuation are distinct—the one economic and the other uneconomic. They are quantitatively and qualitatively opposed, and therefore in mutual contradiction.

Of two contradictories, one is true and the other false. No intermediate between them can be true. From the falsity of one, the truth of the other follows. From the truth of either, the falsity of the other may be inferred.

The doctrines of equitable election and of legal estoppel preclude the assertion of claim by or on behalf of a party both under and against the same state of fact, principle of equity, or rule of law.

Value is the measure of wealth, the degree in which property exists, expressed in terms of wealth subsisting in a different form. It proceeds from utility, and is the resultant of the algebraic sum of the forces of demand and supply. In form, it is a statement of equivalence; but, since equivalence cannot properly be affirmed of things essentially unlike, and because the content of wealth is the only attribute usually or necessarily common, value is in substance an equation.

The import of value is that the terms of the equation—the thing valued and the concrete thing employed to express value—are mutually convertible without deficit or remainder. When this is not feasible, the affirmation of value is untrue. Predicated of property, but employed in another significance, value is a misnomer. The fallacy of ambiguity is to be avoided.

The value of a railroad is the present worth of the annuity created by the periodic returns of net revenue, in enjoyment or expectancy, funded at the prevailing rate of commercial profit. The elements of utility and appropriation, demand and supply, together with resulting price, are here present.

Although there may be as many potential values as there are distinct uses and separate demands, there can be but one value effective in the same place and at a given time. Value is unique.

The suggestion of "other values and elements of value" is unscientific and unintellectual. Going-concern value, for example, is not the difference between commercial value and cost of reproduction, but the divergence between value re-

sulting from the primary demand and that consequent upon the highest subordinate demand: between transportation value and scrap or dismantlement value.

The proof is conclusive. A railroad in operation and producing net revenue has a value greater than if in a static condition, neither used nor useful. A property yielding 2 per cent. on cost of reproduction when capital commands 6 per cent, is worth less than reproduction cost. According to hypothesis, going-concern value is then a negative quantity. But value is either zero or a positive quantity, never negative.

Physical value is a meaningless collocation of terms. If value were a physical fact, the track-mile, with a fixed quota of equipment and appurtenances, would be its appropriate unit. But the track-mile is merely quantitative, and not accurately expressive of magnitude, while value expresses both quantity and quality.

Stated in terms of itself, it conveys no intelligence. In order to bring it into relation to an extraneous standard, the constituent elements and the standard itself must first be reduced to a common denominator. When equivalence to other property is asserted, economic quality is introduced, and value assumes a distinctively commercial character.

Physical value, as its proponents understand and intend to be understood, is the commercial value of physical property, ascertained in such manner as wholly or in some part to exclude commercial factors of determining effect.

It adopts the principles of economic science, but denies their reasonable application and legitimate force. It yields reluctant cognizance to the forces of demand and supply, but it ignores effective demand consequent upon the transportation use, and proceeds upon the premise of demands which ceased to be influential upon the conversion of materials to such use, and which are thereafter in suspense. It proclaims financial equivalence, but disclaims the mutual convertibility of things declared in substance and effect to be equal.

When the forces and nomenclature of economics are admitted to the terms of the problem, they must be accepted in their positive, as well as in their negative, consequences and implications.

There is no logical escape from the conclusion that a railroad is either an end or a means to an end. It cannot be both. Nothing finite is a means to itself. If an end, it depreciates in the ratio of physical exhaustion, but not otherwise, and is not normally liable to appreciation. Function must be totally ignored. As a means, it appreciates or depreciates according to the manner and degree in which it accomplishes the end whereunto it is appointed.

The value of property must be ascertained with reference to the capacity for and performance of a productive service, or in total disregard of those considerations. Physical value cannot be impeached upon functional grounds, nor can a commercial value be impugned for physical reasons, unless upon the failure of a material agency in the discharge of its office.

It is judicially decided that the constituents of value are at least four in number, including: original cost, and cost of reproduction; revenues and expenses, and the amount and market value of outstanding stocks and bonds.

The concept of physical value is realized in original cost or cost of reproduction. As constituting a test of value,

original cost, or actual investment, is rejected by the courts upon the ground that the expenditure of capital may have been wasteful or extravagant. It has no determining effect, and is at most accorded a discretionary consideration.

Waste and extravagance occur, if at all, in the adaptation of means to an end, and must be understood in their relation to the object of railroad construction. Investment is wasteful or extravagant when it fails to produce an instrumentality capable of meeting the competition of rivals, of rendering a service in request for a reward not in excess of its reasonable value, and of yielding a profit to the owner; that is, by reason of an insufficient demand for service, or an excessive supply of it, and the consequent inadequacy of price. The qualification is economic, and irrelevant to physical value.

Revenues and expenses constitute the subject-matter of operating income, credit and debit, leading to a balance which represents the net operating revenue or a net operating deficit.

Net revenue is the cause, of which the aggregate market value of outstanding stocks and bonds is the effect, and is properly to be regarded in conjunction with it. The value of securities outstanding is the base, whereof net revenue is the percentage, and the ratio of return is the rate. It is value resulting from the use of property, and varying with the profitability of that use.

Present value is not necessarily co-extensive with legitimate value. After half a century of limitation in disregard of value, or with regard to a false concept of value, present value is probably a remainder.

With original cost eliminated, and net revenue merged into security value, the issue is so narrowed as only to include cost of reproduction and the amount and market value of stock and credit obligations.

Both the statute and decisions limit the application of fair value to such property as is devoted to the public convenience; that is, to property used and useful. The law ignores mere physical existence. Instrumentality is affirmed, function is asserted, and the emanation of value from productive service clearly implied. Thus physical value is excluded by antecedent condition.

Cost of reproduction derives a verbal but negative plausibility from the economic truth that price (pecuniary value) tends towards such cost. But price seldom reaches that level, and its coincidence with reproduction cost is accidental and temporary. Before that stage is reached, the marginal producer is eliminated, supply is curtailed, and the tendency of price is to advance. The intervening margin is variable, and the relation of price to cost of production inconstant.

The importance of reproduction cost consists in the indication which it affords concerning the liability to competitive construction, in its effect upon the course and duration of returns.

Again the argument is economic in character, and not germane to physical value.

A new competitor will not enter the field with an old and depreciated plant. Cost of reproduction *less depreciation* is not responsive to the question of value. Cost of reproduction is an empirical finding, incapable of exact proof or scientific demonstration, and concerning which rational minds equally well informed may and do differ radically. It is not an ascertained fact, but usually a disputed opinion, advanced in advocacy of the cause of a party. The opportunity which it affords for an abuse of discretion is virtually unlimited.

Cost of reproduction is alleged in avoidance of commercial value, and must in the nature of the case differ from it in a substantial manner and to a material degree. It is a non-commercial value, not definitely related to commerce, and unadapted to serve as the basis for its reasonable regulation.

Cost of reproduction is nowhere else recognized as the criterion of value, and it is therefore discriminatory. Fairness does not consist with discrimination.

Cost of reproduction is an intermediate between contradictions, barred by the law of excluded middle.

Actual investment and cost of reproduction are alike in kind, and differ only in degree according to the lapse of time. Actual investment is cost of reproduction in the past tense. Reproduction cost is actual investment assumed as of the present time. Both are values resting upon demands no longer effective. The reasoning which warrants the rejection of either, precludes the acceptance of the other.

A new line of railroad, pending the establishment of commercial relations, is not lawfully entitled to allege cost of reproduction as the test of value. But at that time actual investment is identical with reproduction cost, as nearly as the latter can be ascertained.

When the event demonstrates that a line of road has been unwisely located, cost of reproduction is accorded no greater respect than actual investment. Indeed, reproduction cost may well exceed actual investment, quite apart from the question of depreciation.

The title of reproduction cost to rank as value is actually challenged by reason of the rarity of population, the insufficiency of traffic, the presence of competition, and the inefficiency of operation. Population is insignificant except as it is translated into traffic. Traffic is demand for service in visible manifestation. The service which a particular carrier is capable of providing is its contribution to supply. Service offered by other agencies is competitive supply. Efficiency affects the quantity and quality of supply.

Each fact alleged, every law invoked, is both approbated and rebated.

The demand for and supply of transportation service, now renounced in order to justify physical value, are now weapons employed in the furtherance of an assault upon its integrity.

Cost of reproduction, as already observed, is a pseudo-value, dependent upon arrested demands. It is asserted, denied when greater than value resulting from effective demand, and reasserted with damaging qualification when less than value consequent upon efficient demand.

Before exhaustion occurs, it is affirmed that useful life is the test of value, and denied that value is in the ratio of physical existence to reproduction cost.

After exhaustion takes place, it is denied that useful life is the criterion of value, although indefinitely prolonged, and affirmed that value is in the proportion which unexpired physical existence sustains to reproduction cost: subject, however, to adequate traffic, immunity from injurious competition, and to a suitable degree of efficiency; that is, to the forces of effective demand and supply.

Efficiency and inefficiency, the sufficiency and the insufficiency of traffic, are what might be termed continuing functions. They are opposite aspects of the same fact, lying respectively above and below zero, and differing solely in degree. The location of zero is relegated to the discretion. When negative, they are properly alleged in derogation of value. When positive, and abundant in extent, their efficacy to produce an augmentation of value is wrongfully denied.

Contrary to reason, and in antagonism to law, the advocate of physical value asserts claim to the benefits of both the physical and the commercial standards, but disavows the pains and penalties of either; and he does so in the ascertainment of reasonable value pursuant to law.

But the value of property results from the use to which it is put and varies with the profitability of that use, present and prospective, actual and anticipated. There is no pecuniary value outside of that which results from such use.—Cleveland, Cincinnati, Chicago & St. Louis Ry. Co. v. Baekus, 154 U. S. 459, 445.

In the absence of a fixed standard of value, rate regulation is arbitrary, and private property is exposed to predatory invasion. The recognition of two or more standards marks a departure from standard. The effect and presumptive purpose of a plurality of standards is to discriminate. An act of confiscation is not mitigated, and not divested of its pernicious character, because it is evasively accomplished by fiat of special and destructive definition.

DEPRECIATION

Value fluctuates directly as appreciation, and inversely as depreciation. Value expired, during the term of its existence, is one in origin and substance with value remaining unexpired. An accepted standard of value is obligatory as a basis upon which to reckon depreciation.

Original value is equal to depreciated value plus depreciation. The sum of unlike quantities is nondescript. Depreciated value is original value minus depreciation. The difference between unlike quantities is alien to either.

In view of commercial value, or of physical value modified by "other values and elements of value," neither original cost nor cost of reproduction affords a tenable basis of depreciation. In contemplation of reproduction cost, original cost is similarly disqualified.

Original cost is not co-extensive with value. Depreciation is a change in value. Therefore original cost does not afford a rational basis for the ascertainment of depreciation.

Cost of reproduction relies for support upon the considerations underlying original cost. Because of this, and inasmuch as reproduction cost is challenged by reason of economic disability, depreciation is not the proportion of such cost corresponding to physical depletion; nor, to state a distinct fact, is it equal to the present cost of necessary repairs and renewals.

Value is not proportionate to physical existence, nor is its variation commensurate with any change in physical extent or duration. Property used and useful, although in a state of depletion, possesses value, or at all events is capable of possessing it. A plant not used nor useful, although greater in physical extent and superior in physical quality, is destitute even of physical value. A positive quantity is greater than zero. It follows that depreciation—that is, the expiration of value—is not in the ratio of expired physical existence to any principal sum. Still less does it sustain a fixed relation to physical existence expiring, but never permitted to expire.

The contribution to value made by repairs and renewals will be less than, equal to, or greater than, their current cost. If less than cost, the conversion of liquid assets into fixed property has the effect, not of neutralizing depreciation of the property in its entirety, but of producing it. When equal to cost, they neither produce appreciation nor prevent depreciation, and their postponement involves no dereliction. Unless greater than cost, repairs and renewals will not normally be made.

The cost of deferred maintenance is the sum necessary to overcome depreciation resulting from physical exhaustion; but such cost does not necessarily reflect its extent as a function of value. Depreciation is equal to the current cost of postponed repairs and renewals, plus the loss in productive efficiency during inactivity.

Presuming the average life of ties to be 10 years, for example, the combined life remaining unexpired in each series of that number will, upon the lapse of a few years, be the quotient of 9 plus 1, or of 10 plus 0, divided by 2; and depreciation will amount to 50 per cent of cost, less the value of scrap material recovered. The salvage of ties is a negative quantity.

After a period of adjustment more or less prolonged, this will be broadly true of all elements of property other than land.

In the orderly course of events, this alleged depreciation occurs during the period of development; when it is held that the carrier is entitled to reimbursement, but when, upon failure for any reason to exercise it, the right lapses; when title to a fair return is in suspense, and when reimbursement is probably impossible; when cost of reproduction does not constitute the test of value, and when depreciation is disproportionate to it.

This is the highest state of physical excellence possible to

attain without a waste of capital, in the form of labor and materials, so flagrant as to defeat title to fair remuneration, and to vacate the claim of reproduction cost to represent value. Neither upon the performance of its conditions, nor upon a failure to perform them, is the equivalence of reproduction cost to value acknowledged. Thus the theory of physical value is self-destructive.

At the present time locomotives, cars, and certain classes of materials, are quoted at advances of from 100 to 300 per cent within three years. When these conditions prevail, it is possible for so-called depreciation to exceed original cost, or cost of reproduction as of an antecedent date, notwithstanding a residuum of useful life; while salvage may well reach a sum equal to or in excess of either cost.

The decisions give express recognition to the potentiality of appreciation. But in the circumstances here described appreciation cannot occur until, within the life of the least durable material, advances in the wages of labor and the prices of supplies approximate 100 per cent, and never in normal conditions. As renewals are made at increased cost, the supposed appreciation diminishes to a corresponding extent.

Appreciation and depreciation cannot both be ascribed to the same property, or any component part of it, at a given time. Appreciation or depreciation is the difference between two values. Present value cannot be at once greater and less than value at a focal date in the past.

It is the province of capital to provide plant and equipment in a condition for operation. It is the function of expenses to wield the instrumentality and maintain it in a condition for continuous operation. It is not incumbent upon, nor is it permitted to, the expense account to perpetuate a condition of newness.

At the time when repairs and renewals are necessary and economically possible, depreciation is said to be matured. Previous to that time, it is popularly described as accrued. Depreciation is an item of operating expense, antecedent to the question of profit. Upon maturity, the operation which neutralizes it and restores the original condition, occasions a charge to operating expenses, and it is actually so made, without effect upon accounts representing the cost or value of fixed property.

In its credit relation, it affects working capital through the media of vouchers, pay rolls, and the material account, subject to reimbursement from revenues in excess of operating expenses, including depreciation as a part thereof.

At an inchoate stage, and pending maturity, depreciation cannot be so charged as to involve a credit in diminution of property value.

Anticipated charges to the income account, such as accrued interest and taxes, might with equal reason be deducted from the value of property.

A railroad is a means to an end. While efficiency is maintained, an instrumentality suffers impairment, not from inherent causes or defects, but from the lapse of the office or its performance by other agencies; that is, from lack of traffic, the inferior quality of traffic, or the pressure of competition.

When repairs are punctual and adequate, and renewals are in proportion to the average life of materials, operating expenses have fully discharged their obligation to the property, there is no failure on the part of a material agency in the performance of its function, a condition of undiminished capacity is perpetually maintained, and existing depreciation, if any, results from causes other than physical exhaustion.

The depreciation here alleged is of the accrued variety. The distinction between accrued depreciation and matured depreciation is purely fictitious, and without foundation in fact. Depreciation is the difference between two values, let it be repeated, and its maturity is in the same ratio as its accrual. The fallacy of ambiguous terms is plainly evident.

Accrued depreciation, falsely so called, merely points the time when depreciation will occur, in the contingency that operating expenses fail in the discharge of the obligation devolving upon them. Inasmuch as depreciation is an element of expenses, it is necessary to conclude that upon the performance of such obligation depreciation is neutralized. Neither reason nor law admits the imposition of impossible conditions.

The effect and legitimate purpose of recording accrued depreciation is to equalize operating expenses, the occasion for which seldom arises in railroad accountancy.

Accrued physical depreciation rests upon the incomplete exhaustion of material elements, and is independent of the perpetuity of useful life. Functional depreciation, that is, obsolescence and approaching inadequacy, predicated upon the expiration of useful life, is independent of physical existence, extent or duration. They are mutually incompatible, and not at once capable of rational justification.

It is important to differentiate between an element of property and a unit of property. The element is related to the unit as the atom to the molecule. The unit is an integral part, capable in itself of performing a transportation service, and of possessing a transportation value. Although the element may be indispensably necessary, the contribution which it makes to value is undetermined and indeterminate.

Neither value, appreciation nor depreciation, can be allocated to constituent elements, any more than it is possible to decide which leg of a tripod is most essential to its stability. Each must be ascertained with reference to an integral part. Rails and ties, locomotives and cars, are not integral parts.

A line of railroad otherwise complete, but without locomotives, or having but one rail, or lacking one length of rail in each mile of track, is neither used nor capable of use, and not admitted to the inventory of property which is the subject of fair value. The locomotive and the rail, or length of rail, are under a like disability. Value other than for purposes of dismantlement is not attributable to either set of elements apart from the other. Whether physical or commercial, value is in abeyance until the component elements are combined into a unit, complete in itself, capable of producing service, and of response to demand.

The franchise is a condition precedent to use or usefulness. But certainly the advocate of physical valuation can ill afford to assume an attitude which would impute all or any part of value to an intangible right.

Depreciation, in its application to fair and reasonable value, raises no embarrassing question. It is ascertainable in its entirety by a simple and direct mathematical process. The problem derives its origin from physical value, in relation to which it is insoluble.

A single problem involving two or more unknown quantities is incapable of solution. The question of depreciation introduces three quantities, of which two being known, the third can be deduced. It presents itself in two aspects, viz.:

First, given original value and depreciation, to find depreciated value.

The analysis of depreciation is directed towards the end of synthesis. The purpose is to determine the aggregate amount of depreciation, which in turn has for its object the ascertainment of depreciated value by subtraction. But since value is not proportionate to physical existence, because depreciation is not in proportion to physical exhaustion, and inasmuch as depreciation cannot be allocated to constituent elements, analysis and synthesis are alike impossible. The proposition presumes the conclusion in the process of reaching it, and admits of no solution.

Second, given original value and depreciated value, to find depreciation.

The terms of the proposition furnish the desired result, to which depreciation is merely corollary, and not a matter of direct concern.

PRACTICAL PATRIOTISM AND TRANSPORTATION*

By Howard Elliott

Inspector of Transportation, Los Angeles and Salt Lake, Los Angeles, Cal.

Co-operation, like patriotism, is something more than a state of mind. The girl who says, "I love you, Mother," and then sits down to read the latest novel while mother does the dishes and scrubs the floors, is minus the divine spark of love which is active rather than latent. And the man who preaches patriotism from the housetops, uncovers at the sight of Old Glory, is the first to rise at the sound of the "Star Spangled Banner," but who fails to buy a Liberty Bond, declines to unload his freight cars quickly, refuses to economize on food and fuel, or to do anything affirmatively to help his country in time of need, is but a shade superior to the traitor who gives aid and comfort to the enemy.

Here are a few ways in which the citizen can help the railway, and by so doing, help the country, in these perilous times:

1. Load and unload cars the day they are spotted. If you regard demurrage as a get-rich-quick scheme of the carriers, cheat them out of some of their riches by handling your cars within the free time. The agents will rise up and call you blessed.

2. The upper berth of a freight car is used only part of the time. Please fill your cars top and bottom. Encourage your customers to buy in carloads instead of less than carload lots. This makes heavier car and train loading, reduces the car shortage, and saves fuel on the locomotives.

3. Purchase upper berths in sleeping cars. They are 20 per cent cheaper, the ventilation is better, there is less noise, less jarring, less chance to have your toes stepped on, the springs are better, there is more privacy, more room to stretch, more evenness of temperature, and you are performing an act of patriotism by helping the railway make every sleeper do double duty. A lady who had been almost persuaded to take an upper said to the ticket agent, "But I'll have to get up before I go to bed." "Very true, madam," replied the resourceful agent, "but the advantage is that the porter takes steps to put you to bed."

4. When you make a shipment by freight or express, pack it as securely as though it were destined to a foreign port, write the address as though it were to be read by a one-eyed man in candle light. See that tags are fastened securely. Erase all old marks. A shipment can't talk, and in case of two addresses, someone will have to guess which is right. Often the guess is wrong. If there are two stations of the same name in the same state, show the county. Help "make shipments expressly safe," a slogan I have just invented and which I am going to donate to some of my express company friends if they want it. The Salt Lake Route's ratio of loss and damage payments to gross freight revenue is less than four mills. This is as good as any road's anywhere, but railways nowadays are not trying for individual records. We want to win a war, not a skirmish, and for that reason we have pooled our resources and our ideas so that we may be able to "do more with less."

5. When the next legislature convenes, say to your senator or representative, "This is no time to pass restrictive railway legislation. If you must introduce some measures affecting common carriers, put in some repealers on the senseless car limit, extra crew and valuation bills. Try to put through an anti-trackwalking law and an act requiring drivers of vehicles to stop before crossing railroad tracks at grade. Such a program will conserve man power and resources."

*Abstract from an address before the Commercial Board of Los Angeles, Cal., on October 24.



Fig. 1. An Electric Escalator Acts as a Speed Boss.

Handling Freight Faster With Fewer Men

By Using Electric Trucks One Road Moved 60 Per Cent More Freight With 42 Per Cent Less Labor

By F. C. Myers

The Society for Electrical Development, Inc.

ONE day in July, 165 men were busily engaged in handling the LCL freight at one of the larger freight transfers. The men were so numerous they got in each other's way. On the next day, when electric truck service was started, 48 men were discharged. At the same time the freight was handled faster and with less congestion. Since the introduction of electric trucks the tonnage handled through this shed has increased 500 tons a month and the force has not been enlarged.

At another terminal one afternoon in August 30 team trucks were waiting to unload at 4 P. M. At 4:30 there were 32 trucks still waiting. The last truck backed up at 6:19 and it was 6:30 P. M. before all were unloaded. During this time only 3,875 packages were handled. One week later, when electric power had replaced the hand trucks, 19 trucks were waiting to unload at 4:00 P. M. At 4:30 the number had increased to 22 trucks. All trucks were backed up at 5:15 and the last one unloaded at 5:45. Forty-five minutes were saved and 5,350 packages were handled. The results given are from actual observation by the writer. It should not be understood that power trucking apparatus is recommended for every terminal or transfer point. Each case must be considered on its merits as conditions will determine what equipment best meets the requirements. There is no one remedy for all freight hauling problems any more than there is one medicine that will cure all the ills of the human family.

To talk about labor shortage seems futile, but the indications are that the real shortage has not yet arrived. Millions of men may be called into the government service before

the end of the war. The men left at home to do the work will be the defectives, the old and the young. This means inefficient workmen and more and more dependence must be placed on mechanical aid. The men that are left will be in great demand so that wages, which are high now, will go still higher. Where the end will be no man is bold enough to prophesy.

At the same time manufacturers are constantly increasing their output, which is another way of saying that shipments are steadily increasing. The 100,000,000 people of the United States will continue to live and require the necessities of life. Our allies and our army across the sea and in the training camps must be fed, clothed and housed. The burden that is falling on the railroads is enormous and will increase. How are they to handle the situation, limited as they are, in labor, in equipment and space for expansion?

This problem will not end with the war. The enormous wastage of men and material that is going on cannot be replaced in a day or a year. Cities, yes, countries, must be rebuilt and the burden of transportation will be heavy for many years.

Wonderful results are being obtained by heavier loading of cars and by urging shippers not to delay in loading and unloading shipments. Locomotives are being operated to the limit and trains are moving as rapidly as coal and trackage will permit. There is still room for heavier loading. But there is greater room for improvement in loading and unloading methods and in handling freight quickly and economically at transfer points and terminals.

The efficiency of human labor depends primarily on two

things. The physical condition of the labor and the mental attitude with which the work is tackled. Men of the class obtainable for truckers and freight handlers do not usually take the best care of their physical condition. Their mental attitude is one of absolute non-interest. They do the work because they must and only do as much as is necessary to hold their jobs, or to make a "stake."

Much of this trouble can be overcome and freight movement facilitated. Making the work easier is one method and to make the work easier machinery and power must be used for lifting and moving freight. Some development has taken place along these lines and some of the railroads have made great improvements, but much is yet to be done, as at many terminals freight is still handled just as it was when the railroads were first built.

FUNDAMENTALS OF PROBLEM

The fundamentals of the freight handling problem are few and simple. Freight is moved either horizontally or vertically. The hauls are either short or long. The package either



Fig. 2. Portable Electric Conveyors Pile to the Roof and May Be Placed at the Most Convenient Point

vary greatly in size and weight or they are uniform in size and weight. When considering the solution of freight handling problems these fundamentals should always be borne in mind.

Lifting and lowering freight from one level to another is increasing in importance because of the increasing number of double decked freight houses. Ramps have been used from time immemorial. It is not uncommon to see four or five men struggling to push a truck up a ramp, then walking to the lower level for the next truck load. With reasonably good floors one man can move a truck horizontally where several men are required to lift it up the ramp. In order to increase the number of men on trucks going up ramps extra men must be employed or they must be taken away from regular trucking work. Ramps usually increase the labor cost out of proportion to the material being moved or else delay the regular work.

The old two-wheeled hand truck, with its "husky" on the handles is the most familiar figure wherever freight is to be loaded or unloaded or transferred from one carrier to another. This method is slow and unreliable. Wherever lifts are necessary mechanical means are available for doing the work and should be employed. Inclined elevators or escalators, (Fig. 1) can be used. These machines are electrically operated, so that power is consumed only when they are being used. They have a large capacity, because of the steady stream of trucks that can be kept moving upward. They travel at a uniform speed and thus act as a "speed boss" for the truckers. They can be designed to travel in either di-

rection or the direction of travel can be reversed so that they can help truckers to bring freight down as well as to lift it up.

Under ordinary conditions, a 10 or 15 horsepower electric motor will provide all the power necessary to operate the inclined elevators or escalators. The current consumption will therefore be approximately 11 kilowatts an hour when working to full capacity. With a power rate of 5 cents per kilowatt hour, the maximum cost of current will be 55 cents an hour. As full load conditions will seldom maintain except for a few minutes at a time, the cost will be materially less than this. Also there is no cost for power when the elevator is not in use. Under present labor conditions the wages of two men for an hour will about equal the cost of electric current, but the difference in the amount of freight that two men can lift as against the amount that one of these elevators can lift is beyond statement.

LEVELING DEVICE FOR ELEVATORS

Vertical elevators are well known and largely used. There has recently been a development in this equipment that is worthy of note. A micro-leveling device has been produced that automatically maintains the floor of the elevator level with the floor from which the freight is being taken or onto which the freight is being placed. The time required for properly stopping the elevator and adjusting it as the load becomes heavier or lighter to facilitate truck movement out of the door is eliminated as is also the need of struggling to move trucks when the height of the elevator floor changes. Elevators are now proportioned to suit the style of trucks to be used and with capacities suited to the loads to be handled.



Fig. 3. Electric Trucks May Be Operated by Cheap Labor

Portable inclined elevators (Fig. 2) will be found economical in some locations, for instance, where quantities of material are to be lifted from one level to another at different points in a freight house, but where the quantities are not sufficiently large at any one point to warrant the expense of a permanent installation. Another case would be where freight is to be lifted or lowered from cars into boats at different points, or where large quantities of material must be handled from teams directly into cars which cannot be placed on team tracks or boats. These portable elevators consume approximately the same amount of electricity as the stationary equipment, depending on the kind and amount of material to be handled.

The horizontal movement of freight offers a big opportunity to save time, money and man power. Each time packages have to be lifted on or off a truck, time and human energy is consumed. Time is lost each time that a truck has to wait to unload. Congestion on platforms is caused by the man handling of freight and the inability to move it as fast as

it arrives. This condition applies also to car unloading. Every time that a car has to wait for truckers a delay is experienced that increases the cost of freight movement and ties up investment that should be working.

ELECTRIC TRUCKS

A man with a two-wheel truck is usually a liability these days. Even though wages are high, men are difficult to get and they cannot work fast enough or long enough to do the work required. Machinery can work continuously if properly attended. Electric trucks are "fool proof." They can be operated by the most ignorant labor (as shown by Fig. 3), and almost the only way they can be wrecked is by deliberate intent. They can be operated in approximately the same space as the old two-wheel truck. Their capacity can be made anything desired.

Two types of electric trucks are available. Carrier trucks, Fig. 3, and tractor trucks, Fig. 4. Carrier trucks carry the load just as the usual automobile truck carries its load. The tractor trucks draw the load just as the locomotive draws a train of cars. Both of these types have their applications and neither of them will be found economical under all freight transfer conditions.

Carrier trucks are especially adapted to work where they must be driven, loaded and unloaded by the same man,



Fig. 4. One Man With an Electric Tractor Truck Can Haul Half a Dozen Loaded Trailers

or wherever material is to be moved to scattered locations in such small quantities that it would not pay to have gangs of men to load and unload it. Carrier trucks can be run directly into cars for loading and unloading. They can be used economically where the loads can be handled quickly. It has been found that the use of one of these trucks for only a few hours a day may save more than liberal interest charges on the investment. For example, carrier trucks are being economically used for handling baggage, express and mail at passenger stations. The driver loads and unloads them and the loads are delivered to and received from trains standing at any of the platforms. More baggage is moved in one load than several men could move on the old style hand truck and the trip is made at the rate of from 5 to 8 miles an hour, where men pushing a loaded truck would hardly average $2\frac{1}{2}$ miles an hour even for a comparatively short distance.

Ordinarily, a carrier truck will either release for other work or eliminate from the payroll five or six men. Instances have been known where the force of truckers has been reduced 40 per cent and where the investment paid for itself in four months. If one truck will eliminate four men drawing \$3 a day the payroll will be reduced \$12 a day. Counting 300 working days in the year, the reduction on the payroll will be \$3,600, which is 6 per cent on \$60,000, an attractive saving when it is remembered that the truck costs approxi-

mately \$2,000 and that it can be operated for about \$1 a day of 10 hours.

Tractor trucks have their special field of utility. A tractor can draw a heavier tonnage than a carrier truck of equal battery capacity can carry, other conditions remaining equal. Tractors are useful where freight can be collected at some central point in the freight house and then delivered to the cars or teams. They can be used wherever loading and unloading gangs can be employed. The tractors are usually operated by two young men or boys, one to do the driving and the other to attend to the coupling and uncoupling of the trailers. The more continuously the electric trucks are operated the greater will be the saving because this part of the system represents the major investment. This is important because the overhead charge operates continuously.

OPERATING DATA

The following data has been taken from the files of a large railroad. On a short haul 24 men with hand trucks handled 49,881 lb. of freight in two hours. At the same place, under the same conditions and with the same class of freight, a tractor and trailer, with 10 men, handled 73,097 lb. of freight in $2\frac{1}{4}$ hours. The amount of freight handled was increased 68 per cent. The number of men were decreased from 24 to 10 and the length of time in handling the freight was only increased one-quarter hour. The labor charge in the first case, at 30 cents an hour, was \$14.40. In the second case it was \$6.75. The net saving in labor alone was \$7.65, but 23,216 lb. more freight were moved. At this rate for an eight-hour day with the truck, 259,904 lb. of freight will be handled by 10 men, against 199,520 lb. with 24 men, providing the 24 men could keep up the pace throughout the entire day, which is not likely. Actually under the old system each man handled 1,049 lb. of freight an hour. With the trucks each man handled 3,248 lb. of freight an hour. As the length of haul increases, the advantages of the electric truck increase, due to its greater speed.

The writer recently saw a tractor perform. A large piece of machinery, which on skids would just slip through the door of a car, was to be loaded. Of course, a truck of any kind was impossible. Eight men with pinch bars were trying to pinch the machine along the platform with the usual delays and slow movement. It was suggested that the platform ahead of the skids and the skids themselves be greased and the machine pushed into the car. Under these conditions a tractor did the work in a few minutes, and all the men but two were released for other work. The time saved cannot be computed in this case, but it would not take many such operations for the truck to pay for itself.

Other means of handling freight are available and each has its peculiar application. A movable loop has recently been developed for moving freight from loading platforms into storage or to team stands. The special claim made for this system is that the overhead trolleys travel from a suspended track, which occupies no floor space. Aisles are reduced to the minimum and goods can be piled up close to the ceiling. The carriers travel in one direction only and by means of the movable ends of the track the distance of travel can be made as short as is consistent with the length of travel necessary. Also by moving the loops the entire floor space is covered and available for storage.

Gantry cranes, traveling cranes and traveling hoists can all be used advantageously under certain conditions, especially where the freight to be handled is heavy and bulky. Conveyors are especially economical where the packages are uniform or so nearly so that one type of conveyor can be used advantageously for a large proportion of the work. These conveyors are, however, usually specially designed so that unless large amounts of similar freight are to be transferred the investment will not be warranted.

For general application the industrial truck of either the

carrier or tractor type will be found to have the widest application. They can be operated anywhere, up or down grades, do not require trackage, low class labor can be employed to drive them, the batteries may be charged during the idle hours of the truck or reserve batteries may be installed and the discharged batteries charged while the truck is operating, so that 24-hour operation is possible. The labor charge connected with freight handling is greatly reduced when handled electrically on account of the fewer men required and the larger amount of freight handled without a corresponding increase in time.

IMPROVED SANITATION AT OUTLYING POINTS

One problem of railway operation which has received little attention is that of sanitation at railway stations, round-houses, shops and other buildings housing railway employees, where no local sewerage system is available. In most such cases the requirements are so limited that the expense of a sewerage system would be unjustified even if the problems of water supply and outfall could be solved readily. The primitive substitutes for sanitary plumbing

is on a basis of 15 persons to each unit, with a tank having a capacity of 125 gal.

A number of railroads have installations of this system, particularly in the east. The Albany Southern, the Buffalo, Rochester & Pittsburgh, the Baltimore & Ohio, the Boston & Maine, the Lehigh & New England, the Maine Central, the Mobile & Ohio, the New York Central and the Philadelphia & Reading, are using this type of toilet in stations, signal towers, crossing watchmen's houses and other buildings that cannot be connected with a sewer. The Lehigh & New England has applied the system to its shops at Pen Argyl, while the Pennsylvania Railroad, the Lehigh Valley, the Delaware & Hudson and the Baltimore & Ohio have installed it in various maintenance camps, the first named road alone having 750 units in use in its camps.

The photograph shows a Kaustine toilet arrangement for a crossing watchman on the Philadelphia & Reading in a case where the watch house is not large enough to accommodate the installation. A better plan, where the size of



Kaustine Installation in a Separate Building for a Crossing Watchman

and sewerage in common use are unsatisfactory and apparently incapable of proper maintenance. The same conditions apply to railway labor camps except that the situation is usually more aggravated because of the larger number of men to be provided for.

In view of this situation considerable interest is attached to a sanitary system now on the market known as the Kaustine waterless toilet system, which provides for the chemical sterilization of the sewage matter by a chemical known as Kaustine, accompanied by a system of ventilation. The Kaustine toilet has the general appearance of a water toilet with a white china bowl, seat and cover. The bowl is attached to an Armco iron antiseptic tank, containing the active chemical which is designed to dissolve the solid matter and act as a thorough germicide. The contents of the tank is rendered harmless and drained off into the ground without fear of any contaminating effects.

The systems can be made to accommodate the requirements of the particular situation, whether large or small passenger stations, signal tower, shop, camp, etc., modifying the installation according to the number of persons to be accommodated. The antiseptic tanks are generally buried in the ground to prevent freezing. Each tank is equipped with an internal valve for emptying; this valve is commonly connected with a four-inch tile. A large disposal bed is unnecessary and under usual operating conditions the tank requires emptying and recharging about twice a year. This

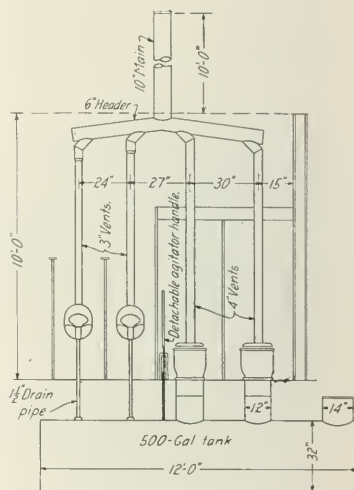


Diagram for a Small Installation

the building permits, is to partition off part of the shanty for a toilet room.

An installation of this system consists of a relatively small number of parts and is said to be simple in application. The equipment is manufactured by the Kaustine Company, Inc., Buffalo, N. Y.

GERMAN RAILWAY OPERATIONS IN OCCUPIED TERRITORY is the subject of an article in a recent issue of the London Daily Mail, which says that at the beginning of September, 4,000 locomotives and 155,000 cars were employed in Belgium, Serbia, Roumania and Courland.

EMPLOYEES' INSURANCE BENEFITS ON THE B. R. T.—The second year of the Group Insurance Contract, made by the Brooklyn Rapid Transit Company with the Travelers Insurance Company for the benefit of the employees of the system, ended September 15 with a total of 6,010 employees insured. The premium contributed by the employees during the year amounted to \$34,965.85, while the benefits derived by the beneficiaries of deceased employees amounted to \$66,000 or within \$2,430.98 of the total premium received by the Travelers Insurance Company. Beneficiaries of deceased employees therefore received \$31,034.14 more than the amount of premium contributed by the employees.

French Railroads Must Have Higher Freight Rates

War Conditions Cause Enormous Increases in Expenses;
Serious Deficits; Fifteen Per Cent Advances Proposed

From *Economiste Français*, September 15, 1917

AMONG all the industries railroad operation is the only one in which the net cost has not stopped increasing while transportation rates have remained the same. And this state of affairs is not entirely due to war conditions. In the years preceding the war the prices of coal and metallurgical products, of which the railroads consume vast quantities, had already been raised to a very noticeable degree. According to the index numbers fixed by the Statistical Office of France (*Statistique Générale de la France*), which cover over 25 materials used in industry, if the average basal index number calculated on the years from 1901 to 1910, and assumed to be equal to 100 is compared with the index number of the same materials for the first half year of 1914, the index number is 113.3, that is to say, the average increase is more than 13 per cent in four years.

In spite of the fact that these averages are only approximately correct it may be assumed that the price of coal and products of the metal industries, among the 25 products which served as a basis for this calculation, have increased to a still higher figure. The price of coal, indeed, has increased at a much higher rate. The statistics of the mineral industry for 1914 give the average price per ton of coal at the mouth of the mine. After having fluctuated between 10 and 11 francs in the years 1890 to 1898 it began to increase and after some fluctuations it went beyond 15.50 francs in 1912, continuing its rise in the following years.

Railroads consume vast quantities of coal. Before the war their consumption of that commodity was nearly 10 million tons, that is, 15 per cent of the total coal consumption of France, which had mounted at that time to nearly 61 million tons. And all this can give only an approximate idea of the rise in the cost of coal, for the prices paid by the railroads were much greater than these average prices, since they were obliged to import foreign coal for their use.

INCREASES DURING THE WAR

Since the war these prices, as everyone knows, have increased enormously, as have the prices of metallurgical products, engines, rails and hoisting apparatus. The Paris-Lyons-Mediterranean Company, which spent in 1913 a little more than 55 million francs for its fuel, has seen that expense pass 170 millions in 1916, an increase of more than 200 per cent. The Paris-Orléans Company, which in 1913 spent 34 million francs for its coal, spent 91 million francs in 1916 for this one item. The amounts expended for coal in the two years compared, 1913 and 1916, have been for the other companies respectively: from 11 millions to 30 millions for the *Compagnie du Midi* and from 30 million francs to 100 millions for the State Lines. And during the present year this expense will be increased at least 30 per cent.

In the case of metallurgical products the increase in cost is also great. The price of rails has gone from 180 francs per ton before the war to 560 francs per ton in 1916; that of screws from 310 francs in 1913 to 1,225 francs in 1917, and bolts have risen in the same proportion. Even ties have doubled in cost and today cost 10 francs instead of five. A locomotive that cost 35,000 francs in 1913 now costs 145,000; a freight car with brake costs 17,300 francs instead of 5,000 francs.

As in the case of coal we must expect a still greater increase in the prices of all these products in 1917,

an increase that we know must be very great indeed.

To these expenses for supplies must be added the increases in salaries and wages of employees beyond those received before the war; expenditures for pensions since the passage of the law establishing them; and also the losses resulting to the railroads from the weekly rest day, the stricter regulation of working conditions and other improvements in the service for the benefit of the personnel. Since the war these expenses have advanced greatly because of increased difficulties in operation.

DEFICITS SHOWN BY THE RAILROADS

All this is indicated by the figures which show the operating deficits. Figures, which were issued from the office of the Minister of Public Works on July 16, show these results in the following table:

DEFICITS RESULTING FROM THE OPERATION OF THE LARGE RAILROAD LINES IN 1916 AND THE PROBABLE DEFICITS IN THE YEAR 1917

Railroad	Deficits in millions of francs			
	In 1916	In the 1st 4 months of 1917	Evaluation for 1917	Increase for 1917
État	150.5	234	234	83
Nord	97	51	138	41
Est	49	27	73	24
P. L. M.	33	45	100	77
Paris-Orléans	24	..	46	22
Total	353.5	123	591	247

From 353½ millions in 1916 the deficits will increase, according to estimates made by taking the first four months of the year as a base, to 591 million francs in 1917, that is, 247 millions more than in 1916.

The only remedy, the economical remedy, to apply to this state of affairs was an increase in rates for transportation. When a manufacturer finds that his cost of production is increasing and finally exceeds the selling price of the articles he manufactures, he raises the selling price. Railroad companies are not to be classed under the ordinary heads; they have not the liberty of making their rates. The concessionary companies work under a monopoly law and it seems very difficult for them to make any changes. This law of monopoly provides that rates shall be fixed by agreement with the State lines, the State lines having the deciding voice in the matter.

In view of the financial results shown by the operation of our railroads, especially since the war, results that we have just summed up in the table, the government proposed a measure having for its object an increase in the rates of transportation on the large systems. It is none too soon. One could even think that the government might have instituted this reform, which was known to be necessary even during 1916. From May 22 of this last year the companies and the management of the State Lines have begged for an increase in rates. The deficits resulting from railway operation must be provided for in the budget as the government is responsible for deficits and it is certainly not the proper time to allow the expenses of the budget to increase when they can be provided for in a normal way.

GENERAL ADVANCES IN RATES IN EUROPE

We are the very last of all countries to come to this reform. It has been forced upon nearly all the European countries and even in the United States by reason of a general rise in prices. Many of them came to it before the war. Since then, the terrible conflict which has overturned economic life, not only in the belligerent countries but in the

neutral as well, has forced an increase in rates in every country. In Italy the rates increased twice in 1911 and another time, shortly before the war, in July, 1914, have been raised twice in 1916. Since 1912 Switzerland has been proceeding with increases in passenger tariffs; she continued it in 1914, 1916 and 1917, and at this time she is preparing to do the same with freight rates.

In Russia rates have been undergoing increases since 1902. In 1915 receipts from taxes on railroads produced 50 million rubles and in 1916 75 million rubles. A new increase of 15 per cent went into effect on January 1, 1917. At that time it was decided that the war tax should cease at the end of 1917. Now they are not only retaining this tax but the Minister of Finances recently proposed to the provisional government a tax on travelers and their baggage. It seems that the tax placed upon travelers before this one did not bring forth any serious complaints. It is now proposed to raise the present tax by 50 per cent, from which increase a supplementary yield of 75 million rubles is expected. The minister even asks for an increase in the tax on freight. In 1916 that tax yielded 143 million rubles and the proposed increase will bring, according to his estimate, 70 millions more.

In Holland certain passenger rates were increased in 1909 and freight rates in 1916. In Norway the same thing took place in 1913, 1915 and 1916. Sweden followed her neighbor during the last three years. In Germany the policy of exceptional tariffs was abolished and they are now about to raise the rates on the Prussian state railroads. According to the *Vossische Zeitung*, Herr von Breitenbach, minister of railroads, submitted to the Railway Council a project for increasing passenger rates 10 per cent. This famous system, which the advocates of government operation of railroads boast of as having made such great financial yields, has thus at last become a charge on the Prussian treasury. In Austria-Hungary freight rates were recently increased 30 per cent. England has also vastly increased her passenger rates. Finally, in the United States, freight rates began to increase in 1914 and continued upward in 1915; passenger rates were treated in the same way in 1916 and it is now announced that over there they are working out new increases. This series of examples might be continued by adding to the list Canada and Argentina in America and Denmark in Europe.

Let us recall briefly that in 1892 the government abolished the supplementary taxes placed on the payments for seats, on account of the necessities of the budget, as a result of the war of 1870-71 and did entirely away with the proportional taxes on fast freight shipments of packages, perishable foods and live stock. A clause in the agreements of 1883 had obliged the companies, in case the state should reduce the taxes on railroads, to put into effect on their side a proportional reduction in the cost of passenger transportation; but no agreement was entered into with respect to freight rates. Nevertheless, in 1892 the companies consented to notable reductions in freight rates. In fact, and especially in the case of fast freight, the transportation charge was reduced in France to an extremely low point, a point which could not be lowered much further. Altogether, railroad rates in France may be considered as very advantageous in comparison with those in the majority of countries, even in industrial countries where a denser movement of trains gives more traffic and higher receipts per mile. In France the railroads are operated by their companies in the most economical manner possible, as is shown by their operating ratios.

An increase would have taken place even if the war had not broken out and for this very great reason it is today impossible to avoid it. The rise in prices before the war, as we have said, would have brought on this reform for the good of the state, for two reasons: On account of the payments which it must make to guarantee the interest and on account of the needs of its own lines, whose working is so very expensive. So there could have been no opposition from

the government to the project which the government has just proposed. It is true that the syndicates of agents have been protesting against an increase in rates. They are afraid that the public will not see cause for such increases in the improvements in service and in the advantages which have been accorded to them for several years. It cannot be denied that expenses of this kind contribute heavily to the expenses of operation. Nevertheless, it must be admitted that in numerous cases increases in salaries have raised the cost of production and obliged the employer to raise the selling prices. To argue the contrary would be a sophism of the kind that one can read into the professions of political candidates who have recently been promising increases in the salaries of officeholders and reductions of taxes to the taxpayers, all at the same time.

ADVANCE OF 15 PER CENT PROPOSED

Let us now look at the government bill for raising rates and see what it consists of. The fundamental feature is very simple. An increase of 15 per cent would be made in transportation rates on the main lines and on the two Paris belt lines, under the following conditions: The increased rates can exceed the maximum rates provided for in the contracts and in the special agreements; they will go into effect on each line five days after the modification has been published by means of posters. Packages sent by post within the country are also subject to the increase. The additional charges on private branch lines can exceed the maximum charges fixed by the contracts with the public.

What will be the effect of this increase of 15 per cent? M. Henry Roy in his report on the subject presents a graphic demonstration. As for the actual price of commodities the increase of 15 per cent will hardly be felt. If 100 kilograms be taken as a unit of weight the increased charge for coal would amount to .095 francs, for steel bars .165 francs, for rails .168 francs, for superphosphates .107, for beef .58 (100 kilos net), for cereals .15 francs. Thus, on a hundred-weight of wheat at 50 francs the increase in the rate would be .003 francs, or 3 millimes the franc.

Other calculations show that the surcharge for coal per ton would be only .92 francs and for commodities coming from Provence to Paris by fast freight the increase would be from 1.5 to 2 centimes per kilogram. In short, if a general average be taken it is evident that if the average rate per kilometer ton in 1912 was 4.20 centimes, the addition of 15 per cent brings it to 4.83 centimes. Up to 1886 the charge was hardly ever below 6 centimes, and in 1897 the rate was at the point to which we are returning by the present reform.

But this is not all. In respect to the relations of the companies toward the state there are additional conditions concerning the increased rate in the agreement which is appended to the proposed law.

Naturally, this agreement repeats that arrangement of the first article of the project which has to do with the 15 per cent increase. The proceeds of the increase ought to permit the state lines to meet their financial obligations as determined by the law of July 13, 1911. The same will be true for the concessionary lines as regards, first, the matter of interest on bonds, dividends on stock, amortization, and second, the payment of their debt.

While hostilities are going on and in the year which follows their cessation a fund will be made of the total increase in the income of the companies which accept the agreement. This fund will be distributed according to the following plan: The operating ratio of each company in 1913, the latest normal year, will be taken as a base. The excess of expenses for each year above the ratio of 1913 will be ascertained for each company and the capital fund will be distributed proportionately to that excess for each one of them.

This system of mutuality will cease after the period of

time indicated above. Each line will then retain the proceeds of the increase which it collects and these proceeds will serve to cover the deficits of the line and to pay off, if they are sufficient, the debt to the state owed by each line through the guaranty of interest. This debt once entirely paid off, the line will keep only three-tenths of the excess produced by the increase and the other seven-tenths will be distributed among the others according to their receipts. The Northern Railway and the Belt lines will not participate in this distribution, which is already known in railway history under the name of "déversoir." These two lines will retain the proceeds of the increase; they will not turn them into the common fund.

PROVISION FOR FUTURE REDUCTIONS OF RATES

Provision has been made for lowering the increased rates. They will be lowered to 10 per cent on all the lines when, after three consecutive years, two lines other than the Belt lines shall have had a surplus to divert to other lines, and the actual increase will be reduced to 5 per cent if two lines have had surpluses to divert two other years in like manner. Finally, they will be abolished if the same condition presents itself in two other successive years.

There is a modification in the clauses concerning the sharing of benefits in the agreements of 1883. According to these agreements the revenues of a system remain with the company up to a certain figure if the debts, in which are included the payments on capital interest and liquidation, are paid off. If this figure is exceeded the state shares with the company. There is no such provision in the new agreement. As soon as there is a surplus, after all debts are paid, it is to be divided between the state and the company. We

must remember that the Northern Railway Company is not in this agreement.

What will be the effect of this increase of 15 per cent? From the point of view of the cost of commodities transported we saw above that it will not have a perceptible influence on their prices, being so small in comparison. Let us note here that in making a uniform increase of rates without changing the bases on which they were fixed, the operation of these rates on prices remains the same as before, no exceptional nor special tariffication being introduced.

As regards the effects of the increase on the receipts of the lines, it has been estimated that they would amount to 300 million francs. Now we have seen above that the deficits in receipts reached 591 millions in 1917, or 600 millions in round numbers. This increase of 15 per cent is then absolutely insufficient during the war. It has not even been suggested that it could cover the deficits of these exceptional years. But in our opinion it is not enough to attain the desired result after the war is over. Surely there will be, let us hope, a redoubling of economic activity, which will increase business and traffic on our railways. Nevertheless, we can not ignore the fact that operating expenses increase with the increase of traffic and operating expenses will continue to increase for many years after the cessation of hostilities. So one must be somewhat sceptical of the optimistic views of the results of this increase of rates. In the previous agreements too much has been expected from future developments, and here again in the present circumstances it seems that too much confidence is being felt. However, it will be necessary to take up the question of railroads on larger grounds after the war, for too many financial problems will then force us to do so.

Immediate Relief Recommended for the Railroads

Interstate Commerce Commission Sends Special Message to Congress. Commissioner McChord for Radical Action

DECLARING that absolute unification in the operation of the railroads during the war is indispensable to their fullest utilization for the national defense and welfare, and that the act to regulate commerce was not designed to meet such an abnormal situation as now exists, the Interstate Commerce Commission on Wednesday made public a special report to Congress recommending that unification of the American railway systems be effected, either by the carriers themselves, with the assistance of the government, or by their operation by the President as a unit during the war, with a guarantee of an adequate annual return. The railroads' proposal that their rates be increased the commission regards as an impracticable solution of the difficulty.

"If the unification is to be effected by the carriers," says the commission, "they should be enabled to effect it in a lawful way by the suspension, during the period of the war, of the operation of the anti-trust laws, except in respect of consolidations or mergers, and of the anti-pool provision of the commerce act. In addition, they should be provided from the government treasury with financial assistance in the form of loans, or advances for capital purposes, in such amounts, on such conditions and under such supervision of expenditure as may be determined by appropriate authority.

"If the other alternative be adopted," says the report, "and the president operates the railroads as a unit during the period of the war, there should be suitable guaranty to each carrier of an adequate annual return for use of the property, as well as of its upkeep and maintenance during operation; with provision for fair terms on which improvements and betterments, made by the president during the period of his operation, could be paid for by the carrier upon

return to it of the property after expiration of that period."

Commissioner McChord filed a separate report, disagreeing with the position of the majority that unification may be effected by the carriers themselves, and declaring that "the supreme arm of governmental authority is essential," either by exercise of the president's authority to operate the roads or by the creation of a single governmental administration control.

In the majority report the commission says: "The act to regulate commerce requires the commission to transmit to the Congress such recommendations as to additional legislation relating to regulation of commerce as the commission may deem necessary. Under this mandate the commission submits the following special report, supplementing its annual report, with reference to transportation conditions as affecting and affected by the war. . . . The railroads of the country came into being under the stimulus of competition; from the outset their operation and development have been responsive to a competition which has grown with the growth of population and industry. This competitive influence has been jealously guarded and fostered by state laws and constitutions, as well as by the federal law. The keenness of rivalry naturally drew to the front those who were quick to seize and resolute to retain every point of vantage for their respective roads. Terminals, if confined to the owner's exclusive use, were not only of strategic importance but profit-yielding assets. Out of competition grew rate wars, pooling, mergers, and consolidation into systems; as well as rebating and other preferential treatment of shippers, which the act to regulate commerce was primarily framed to prevent.

"In that act the congress, accepting the competitive prin-

ciple as salutary, has thrown about it prohibitions against compacts for the pooling of freights or divisions of earnings of different and competing railroads and, while the original act is but the nucleus of the act we now administer, that prohibition has remained unchanged. The original act and the successive amendments were alike framed in times of peace and for times of peace. They looked to protection of the shipper and the public against unjust or unfair treatment by the carrier, and not to protection of the nation and its commerce in time of war by utilization of all the forces and resources of its transportation systems to their fullest extent.

"Since the outbreak of the war in Europe, and especially since this country was drawn into that war, it has become increasingly clear that unification in the operation of our railroads during the period of conflict is indispensable to their fullest utilization for the national defense and welfare. They must be drawn, like the individual, from the pursuits of peace and mobilized to win the war. This unification can be effected in one of two ways, and we see but two. The first is operation as a unit by the carriers themselves. In the effort along this line initiated early in this year they are restricted by state and federal law; and the idea is the antithesis of that which heretofore has controlled their activities. Their past operations have been competitive, although since the Hepburn act, and especially since the Mann-Elkins act, the prescription by this commission of reasonable maximum rates and charges for rail carriers subject to the act and the exercise of its power to require abatement of unjust discrimination or undue prejudice have in great degree restricted that competition to the field of service; but whether or not perpetuation of the competitive influence is desirable under a system of governmental regulation, it is apparent that operation of our railroads as a unit involves the surrender, by each of them, of exclusive use of terminal facilities; surrender, at times, of profitable traffic to other carriers, and acceptance of less profitable traffic with resultant loss of revenue, wherever economy of movement or greater freedom from congestion would dictate that course if the various carriers were in fact one system. The alternative is operation as a unit by the president during the period of the war, as a war measure, under the war powers vested in him by the constitution and those powers which have been or may be conferred by the congress.

"As bearing upon the alternatives thus stated it will be recalled that since the beginning of the war, in 1914, the traffic offered to and moved by the railroads has increased enormously. Prior thereto there had been occasional periods of car shortage, usually restricted in territory; but it may be said that from 1907 down to 1916 the number of cars in the country exceeded the demand. This subject is treated in our annual report. The sudden, unforeseen and unprecedented demand for transportation occasioned by the war placed a strain upon the facilities and equipments of the railroads which they were not and are not prepared to meet. There was created a need for immediate and extensive additions to existing facilities and equipment. This need is coincident with demands upon capital, as well as upon labor, manufacturers and natural resources, such as we have never before known. Important additions and betterments will require new capital.

"The railroads propose essentially that we allow increases in freight rates of such magnitude that their increased earnings will attract investors, by dividends declared or by the prospect of dividends, in competition with securities issued by federal, state, and municipal governments, public utility corporations, and industries organized and operating primarily for gain as distinguished from public service. Some of the latter have yielded large profits since the outbreak of the war.

"An attempt to secure new capital would come at a time when the rising cost of living has made it difficult for those dependent for support upon their earnings to meet their cur-

rent expenses; after the absorption by American capital of two-thirds of the American securities owned abroad prior to August 1, 1914, the railroad securities returned to this country alone amounting to from \$1,700,000,000 to \$2,000,000,000; after financing in this country of loans to our present Allies, and after subscriptions for almost \$6,000,000,000 for Liberty Loan bonds. Even if the railroads have more money, the immediate construction of necessary facilities and equipment could not readily be effected.

"Labor is scarce and the cost of labor and supplies is mounting. Car and locomotive builders are largely engaged in producing equipment needed abroad, both by our Allies and by our own forces. The steel and other materials needed for such construction, as well as the labor, are also needed in other phases of the conflict. Under such conditions and pending the acquisition of such additional facilities and equipment it is indispensable that those now in existence should be used to their fullest capacity; primarily for the uses which are most vitally needed for the country's defense and welfare, but without unnecessary hindrance to the industry and commerce of our people, upon which their ability to contribute toward the success of the war so largely depends.

"The act to regulate commerce was not enacted to meet such a situation. The carriers have the right to demand at our hands, and it is our duty to approve, just and reasonable rates sufficient to yield fair returns upon the value of the property devoted to public use after necessary expenditures for wages, fuel and supplies, reasonable expenditures for maintenance, renewals and betterments properly chargeable to operating expenses, and appropriate depreciation. Measured in dollars, the gross revenues of the carriers during the past and current fiscal years exceed any in their history, but what the dollar will buy in labor, material, and supplies is substantially less.

"We are sensible of the vital and imperative need of the hour that our railroads shall not be permitted to become less efficient or less sufficient. We realize the gravity of a serious breakdown of our transportation facilities. It is unthinkable that this breakdown would be permitted if it could be prevented. Increased charges for carriage, if found necessary to take care of unavoidable increases in operating expenses, would not at this time bring new capital on reasonable terms in important sums. In our opinion the situation does not permit of temporizing. All energies must be devoted to bringing the war to a successful conclusion, and to that end it is necessary that our transportation systems be placed and kept on the plane of highest efficiency. This is only assured through unification of their operation during the period of the war.

"The regulation of security issues of common carriers engaged in interstate commerce should be vested in some appropriate body, as has been recommended in our annual reports. The rights of shippers for reasonable rates and non-discriminatory service under the present jurisdiction of the commission need not be seriously interfered with by such unified control. Some elastic provisions for establishment of through routes would probably be needed."

Commissioner McChord, in his separate report, says that the railroads' war board is the fifth committee which the railroads have had in Washington to deal with the transportation situation since November, 1916. He does not wish to be understood as saying that the carriers' committee has not accomplished results, but he is led to the belief that no voluntary committee can accomplish what the situation demands. The unification needed, he says, is the unification of the present diversified governmental control. If the president does not elect to take over the roads, the authority now vested in the several governmental agencies should be centralized by act of congress.

Commissioner McChord's minority report will be published in full next week.

General News Department

The members and employees of the Interstate Commerce Commission have subscribed funds to present two ambulances to the Red Cross.

The telegraphers of the Philadelphia & Reading have had their pay raised about 6 per cent. It is said that 1,000 employees share in this increase.

W. G. Brantley, counsel for the Southern group, Presidents' Conference Committee on Valuation, has filed a brief and argument of 737 pages in support of the protest of the Atlanta, Birmingham & Atlantic against the tentative valuation of its property made by the Bureau of Valuation of the Interstate Commerce Commission.

The Great Northern has purchased from the Western Union Telegraph Company all telegraph lines along its right-of-way which it had not already owned, amounting to about 3,385 miles of pole lines. The Western Union has made a new contract with the railroad under which it will continue to operate over the Great Northern lines.

The Interstate Commerce Commission has announced a hearing at Washington on January 4 on the application of certain companies for a further extension of the period within which railroads shall be required to comply with the provision of section 3 of the safety appliance act of April 14, 1910, with respect to the equipment of freight cars.

Gold medals bearing the Southern Pacific safety emblem and suitably engraved were awarded recently to the six employees of each division and in each general shop of the Pacific system who, during the year ended June 30, 1917, did the most in furtherance of safety work. C. H. Rippon, piecework inspector of the Sacramento general shops, carried off the first prize for the second successive time.

So far, 193 employees of the Nashville, Chattanooga & St. Louis have enlisted in the army or navy, while 1,449 others are subject to draft. Of the enlisted men, there is one each from the executive, the legal and the purchasing department; five from the traffic, 12 from the accounting and 170 from the operating department; two from the agricultural department and one from the department of safety.

The Southern Pacific Company has recently made extensive additions to its telegraph lines, including a copper wire circuit from Houston, Tex., to El Paso; but in connection with the announcement of this improvement, the company's monthly circular to station agents reiterates the injunction that telegrams should be made as short as possible, and that the wires should not be used for communications which can be sent by letter.

The Erie Railroad Magazine, with its December number, issues a 22-page supplement containing the names of all of the 974 employees of the company now in the army or the navy, or other war service. With each name is given the man's residence, his railroad occupation and whether he is serving in the army or the navy. The cover of the supplement is in three colors, red, white and blue, and bears a representation of a service flag containing 974 stars.

The Commission on Car Service, with the approval of the Railroads' War Board, has directed that the rate of 60 cents a day on interchanged freight cars, which would expire by limitation on January 1, be extended to February 28. The commission has also ordered the cancellation of car service rule 4, which provides that an empty car, at a junction point with its home road, must be delivered to that road, at that point, either loaded or empty.

Action was taken by the United States Fuel Administration on December 3 to provide an increased supply of coal cars and an increased supply of bituminous coal for the Southern Railway and its operated lines. The order provides that coal operators under contract to the Southern and its operated companies shall

fill the fuel contract requirements, in so far as possible, in equal daily quantities. Orders of this character in favor of the Lehigh Valley, the Chesapeake & Ohio and the New York, New Haven & Hartford were noted last week, page 1007.

Newlands Hearing Postponed

The hearing before the Newlands Joint Committee on Interstate Commerce, announced to be held at Washington on December 4, has been postponed at least until December 10.

Southern Pacific Starts Fire Protection Campaign

The Southern Pacific is launching a vigorous campaign of fire protection throughout its system, and the 45,000 employees are being asked to spread the gospel among shippers, warehousemen and others. General Manager W. R. Scott in a circular says: "The responsibility of *feeding* not only ourselves, but our allies, rests largely upon this nation. As all the materials, supplies and food-stuffs necessary for our domestic use, the use of our armies and our navy must be transported over our railways, the necessity for fire protection becomes a patriotic duty. No amount of insurance can replace food and materials that are destroyed."

Industrial Unrest in Great Britain

The Bureau of Labor Statistics, Washington, has issued a bulletin, No. 237, giving a reprint of the report of the British Commission of Inquiry Into Industrial Unrest. The report is presented in eight sections, showing the results of inquiries in eight separate districts of Great Britain. The reports for all the districts emphasize as the leading cause of industrial unrest the fact that the cost of living has increased disproportionately to the advance in wages and that food distribution is unequal. Another cause regarded as particularly serious is the restriction of personal freedom under the Munitions of War Acts, by which workmen have been tied up to particular factories and have been unable to obtain wages in proportion to their skill; in many cases the skilled man's wages were less than those of the unskilled. Dilution of labor and lack of confidence in the Government, growing out of the surrender of trade-union customs and the fear that promises regarding the restoration of pre-war conditions will not be kept, are mentioned. All the reports refer to the lack of co-ordination between Government departments in dealing with labor. Mention is also made of lack of proper organization among the unions, inconsiderate treatment of women as regards wages, delay in granting pensions to soldiers, and inadequacy of compensation under the Workmen's Compensation Act.

Optimism at Ottawa

The Railroads' War Board of Canada, otherwise known as the Canadian Railway Association, is quoted as declaring that the Canadian railways have made a reduction of over 10,000,000 passenger train miles (per annum), which is a greater proportionate reduction than has been made in the United States.

The association further states that "Canada is today getting the best and cheapest railway service in the western world; in spite of car shortage created by the abnormal balance of south-bound over north-bound traffic, in spite of war requirements, higher labor charges, the necessity of importing coal for engines and the lower efficiency of the coal due to lower winter temperatures in Canada, there is a greater degree of efficiency reached in the operation of the Canadian railways than anywhere else in the New World.

"Car shortage is being reduced day by day. The percentage of freight cars out of service for repairs in Canada is lower than the percentage on United States roads and the average cost to the Canadian traveler or shipper is less.

"For the year ending June 13, 1916, the charge for moving an average ton of freight one mile in the United States was 7.16 mills. In Canada it was 6.53 mills. In the United States the

average passenger mile cost the passenger 2.06 cents and in Canada it cost him 1.954 cents. At the same time the Canadian railroads paid more for labor than any of the other roads on this continent."

Railway Regiments' Tobacco Fund

Fifteen more supply companies have made contributions to the tobacco fund for the American railway engineers who have been making history for themselves this last week in France. The following list brings the total to date on Tuesday noon:

American Arch Co., New York (to cover 15 months).....	\$150.00
Chambers Valve Co., New York.....	\$5 a month
Elliott Frog & Switch Co., East St. Louis, Ill.....	10 a month
Fairbanks, Morse & Co., Chicago.....	10 a month
Joliet Railway Supply Co., Chicago.....	10 a month
Kerite Insulated Wire & Cable Co., New York.....	10 a month
Keystone Grinder & Mfg. Co., Pittsburgh, Pa.....	10 a month
Laas & Sponenburg Co., Chicago.....	10 a month
Laconia Car Co., Laconia, N. H.....	10 a month
C. F. Massey Co., Chicago.....	10 a month
Ottensmeyer & Co., Chicago.....	10 a month
Republic Rubber Co., New York.....	10 a month
Steel Car Forge Co., Pittsburgh, Pa.....	10 a month
Union Draft Gear Co., Chicago (to cover 6 months).....	\$60.00
Westinghouse Air Brake Co., Pittsburgh, Pa.....	10 a month

Public Ownership Conference at Chicago

Resolutions demanding the immediate public ownership and control by the federal government of the railroads, the coal mining industry and the telegraph and telephone systems of the nation were passed at the conclusion of the National Public Ownership Conference held at Hotel LaSalle, Chicago, last week. The members of the committee on resolutions included David J. Lewis of the federal tariff commission, J. W. Brown of the United Mine Workers of America, Frank C. Perkins of Buffalo, John C. Kennedy, socialist alderman, Chicago, and Homer Talbot, secretary of the League of Kansas Municipalities. Prof. Charles Zueblin was the chief speaker in favor of government ownership of railways, although he said that existing conditions make it undesirable even to discuss the question of government ownership at this time. He spoke of the necessity of organization and unification to win the war for democracy, at the same time criticizing all concerned for not having made the railroads public property long since.

Railroad Telegraph and Telephone Men Organize for Service in France

Two battalions are now being organized at the Consumers' building, Chicago, for service in the telephone and telegraph departments of the railroads now being operated by American railway regiments in France. The recruiting is being carried on under the supervision of Colonel Leonard B. Wildman, of the signal corps of the regular army. Each battalion will have the following organization: (1) One major (superintendent of telegraph); first lieutenant, adjutant (assistant superintendent and chairman of discipline board); first sergeant, acting sergeant major (chief clerk of office); three privates, attached to headquarters as orderlies and drivers (junior clerks and messengers). (2) Supply detachment—one first lieutenant, supply officer (electrical engineer in charge of supplies); one sergeant, battalion supply sergeant (supplies accountant); four privates, first class, clerks and drivers. (3) Two telegraph companies, each of which will be organized as follows: One captain (division operator); two first lieutenants (assistant division operators); two master signal electricians (one wire chief and one supervisor of signals); seven sergeants, first class (four train dispatchers, one foreman telegraph and telephone linemen and maintainers, one foreman of signals, one instructor and examiner of train rules); 11 sergeants (seven in charge of more important towers and offices; two assistant foremen telegraph and telephone linemen and maintainers; two assistant foremen of signals); 17 corporals (nine towermen and operators, three telegraph and telephone maintainers, five signal maintainers); two cooks; one horseshoer (mechanic); 48 privates, first class (33 telegraphers, six telegraph linemen and maintainers, eight signal maintainers, one barber); 12 privates (five telegraphers, four telegraph linemen and maintainers, three signal maintainers).

The two battalions now being organized in Chicago are headed by Major Frank W. Sherwood, for 19 years in military service, and at one time manager and wire chief on the Western Union

Telegraph Company and an operator on the Chicago & North Western, and by Major P. Kirk Pierce, of Grand Rapids, Mich., superintendent of telegraph of the Pere Marquette. The roster of the officers of the 415th railway telegraph battalion, which is under Major Sherwood's command, is as follows: First lieutenant, E. M. Harding, adjutant, banker at Chicago and formerly agent of the Texas Company at St. Louis, Mo.; first lieutenant, A. E. Manheimer, supply officer; captain, William H. Mann, for the past nine years with Ware & Leland, grain and stock brokers, Chicago and New York, and with previous telegraph experience with the Western Union, the Louisville & Nashville and other roads; first lieutenant, Charles H. Martin, electrician and general wire chief, Chicago & North Western; first lieutenant, Charles S. Pack, train dispatcher, Illinois Central; captain, M. A. Loosley, electrical engineer, with 19 years' army experience; first lieutenant, G. Z. Flanders, trainmaster on the Wisconsin division on the Chicago & North Western; first lieutenant, Robert M. Phinney, assistant engineer, signal department, Chicago & North Western.

The complement of officers of the 416th railway telegraph battalion, under the command of Major Pierce, has not yet been filled. Two similar battalions are now being organized in New York.

Trainmen's Demand for Higher Wages

The brotherhoods of conductors and of brakemen on December 1 presented their request for a general increase of wages to all of the railroads throughout the country in accordance with the previous announcement in the newspapers. The proposed rates for passenger trainmen are as follows:

On runs of 155 miles or less per day: Conductors, not less than 3.5 cents a mile, \$5.43 a day, or \$162.90 a month. Ticket collectors, not less than 3 cents a mile, \$4.65 a day, or \$139.50 a month. Baggage electricians, not less than 2.9 cents a mile, \$4.50 a day, or \$135 a month. Baggage men, not less than 2.5 cents a mile, \$3.88 a day, or \$116.40 a month. Flagmen and brakemen, not less than 2.33 cents a mile, \$3.61 a day, or \$108.30 a month.

The schedule contains the usual provisions for short runs, overtime, etc., overtime in all passenger service to be not less per hour than one-eighth of the daily rate.

The proposed rates for freight service are as follows:

"Through and irregular freight, snow plough and circus trains: Conductors, .053 a mile; flagmen and brakemen, .0381 a mile. For yard crews, the rates contain the usual differences for night work, and are: Conductors or foremen, \$5.30 a day and \$5.50 a night. Brakemen or helpers, \$5 a day and \$5.20 a night. Eight hours or less to constitute a day's work; overtime pro rata; actual minutes to be counted."

Electric Roads Organize to Handle Freight

At the suggestion of Daniel Willard of the Council of National Defense urging the complete co-operation of all transportation agencies during the continuance of the war, the American Electric Railway War Board, recently organized, is planning to assist the steam railroads in the movement of freight. It is believed that the existing facilities of the 40,000 miles of electric roads in the country can be used advantageously as auxiliaries to the steam lines.

A sub-committee on traffic and transportation has been appointed, with a member representing each state, to investigate the possibilities of the electric lines as freight carriers. B. I. Budd, president of the Chicago, North Shore & Milwaukee and the Chicago Elevated Railways and chairman of this committee, states that the electric roads will be of service (1) in moving light merchandise and foodstuffs in and out of large cities for distances of from 50 to 100 miles; (2) in moving freight around congested terminals either in combination with steam roads or with other electric lines; (3) by relieving the steam lines of more short haul passenger traffic, thereby releasing engines and cars for the movement of freight on the steam lines. Electric roads in Ohio, Indiana, Illinois, Wisconsin and Michigan have already federated into a Central Electric Freight Association which is assembling statistics with reference to connections, clearances, rolling stock, rates and routes, to facilitate the movement of freight from one line to another. The American Electric Railways' War Board will have a joint meeting with the Railroads' War Board in the near future to determine how the two classes of carriers shall co-operate in handling freight traffic.

At the present time the Chicago, North Shore & Milwaukee is interchanging freight daily with the Elgin, Joliet & Eastern at Rondout, Ill. The Chicago, Lake Shore & South Bend is handling through freight business between Chicago and South Bend, Ind., daily, a distance of about 85 miles. Arrangements have recently been perfected for the movement of freight from Chicago to Rockford, Ill., about 100 miles, over the Aurora, Elgin & Chicago, the Elgin & Belvidere and the Rockford & Interurban. Illustrative of the service which the electric lines are able to give, freight loaded at Chicago in the evening arrives at Indianapolis the next morning at 9 o'clock. Through freight and passenger services are now in operation between Detroit, Mich., and Columbus, Ohio, about 235 miles; between Detroit and Dayton, Ohio, about 220 miles; between Cleveland, Ohio, and Lima, about 150 miles; and between Toledo, Ohio, and Cincinnati, about 250 miles. The longest through freight and passenger line in this territory is between Terre Haute, Ind., and Zanesville, Ohio, about 325 miles, which the passenger trains cover in 11 hours.

The rates for freight on the electric roads are generally higher than those on the steam roads because the electric lines are not built or equipped to handle freight as economically as are the steam roads.

Shop Crafts Federate to Press Demands

The various shop crafts on the railroads north, south and west of Chicago, including the Chicago & Eastern Illinois, the Illinois Central, the Chicago & Alton and the Wabash, have federated into one body and have distributed ballots among the members to determine what action shall be taken on the following proposed demands: (1) \$5 for a day of 8 hours for machinists, blacksmiths, boilermakers, sheet metal workers and electricians; (2) \$4.50 per day of 8 hours for car men, including pattern makers, cabinet makers, coach and locomotive carpenters, upholsterers, painters, varnishers, letterers and mill machine operators in planing mills; (3) \$3.50 per day of 8 hours for the first 6 months and \$4 thereafter for all other car men; (4) \$3.50 per day of 8 hours for helpers in all crafts; (5) for regular apprentices, 20 cents an hour for the first six months and an increase of 2½ cents per hour for each six months thereafter for the first three years, a 5-cent an hour increase for the first 6 months of the fourth year and 7½ cents for the last six months of the fourth year; (6) helper apprentices to start at the minimum wage for helpers for the first 6 months and to receive an increase of 2½ cents per hour for each six months until the time of apprenticeship has been served; (7) foremen and men employed by the month to receive a minimum increase of \$20 a month.

No member of a shop craft is to receive an increase of less than 10 cents an hour except apprentices. The ballots are returnable by December 10 and a general meeting of the federation will be held on January 4, 1918.

N. Y. C. Freight Tracks in New York City

The New York State Public Service Commission, first district, has begun the preparation of plans for the reconstruction of the line of the New York Central on the west side of New York City from Spuyten Duyvil southward to Canal street, about 12 miles, with a view to ordering the elevation or depression of the tracks at all points where necessary to secure the safety of street traffic.

Certain powers of the New York City government in connection with the regulation of these tracks ceased on December 1 by virtue of an act passed by the last legislature; and the elaborate plan for carrying out the proposed changes, involving many millions of dollars, which was agreed upon between the city government and the railroad company, after several years' costly studies and negotiations, is now, by this action of the legislature, virtually rejected.

In this rejection the legislature carries out the wishes of certain interests in the city, opposed to the city government, whose aim it is to deprive the railroad company of certain rights in its roadbed which it has possessed for seventy years; and to so limit any grants which the city may make, in connection with the proposed changes, that no right of way on or over public property shall be held by the railroad company except on condition that the rate of compensation shall be subject to readjustment every 25 years.

The railroad company, which, at great expense, had made prop-

arations for the proposed changes and which, by the agreement that was made with the city, was to increase its investments in property in the city by some fifty millions of dollars, is expected to oppose, in the courts, the attempt of the state authorities to modify what has been understood to be a perpetual franchise.

Interline Way Billing

The president of the Association of American Railway Accounting Officers has issued a circular dated December 4 in part as follows:

This association, through its appropriate committees and through the individual efforts of some of its members, has for years past strenuously advocated the general adoption of through interline waybilling.

That the action taken by you at the last meeting of the association has borne fruit is evidenced in bulletin No. 42 issued by that executive committee [the War Board] in which an appeal to increase the efficiency of the railroads is made. From it I quote the following:

"Start a systematic, vigorous campaign to provide universal interline waybilling, a study of the operation of which on one large system convinces us will result not only in a large money saving, but in saving 12 to 18 hours' time on cars and the continuous services of one switch engine, handling setbacks account 'no billing,' at each representative terminal."

The part the accounting officer can and should take in this campaign is of prime importance and I am quite sure if we will carefully prepare, based on data obtainable from division superintendents and other officers as well as that available in our own offices, estimates of the possible advantages to be gained from the proposed innovation, the results would go a long way in making universal interline waybilling a possibility.

Let me suggest that we, each of us, endeavor to ascertain estimates of what results would follow if all intermediate inter-road rebilling were abolished. Such estimates should show:

- (1) Clerical costs saved at agencies.
- (2) Approximate saving in car days, because of ability to move cars in continuous movements.
- (3) Approximate saving in switching costs by reason of discontinuance of double movement of cars awaiting revenue way-billing.
- (4) Overcharges are generally reclaimed. If they occur can we not assume that there are an equal amount of undetermined undercharges and would not universal interline waybilling avoid many such? If yes,
 - (a) What saving would be effected by eliminated undetermined undercharges?
 - (b) Could you reduce freight agency cost? If so, how much?
 - (c) What effect would such waybilling have on loss and damage claims? Are not losses occasioned by errors made in rebilling?

The foregoing are some of the things we can look into; there may be others.

After making your estimates, advise your chief executive and your traffic officer of them.

Railroads Not Only Industry Pressed by War Demands

In an address before the Peoria (Ill.) Transportation Club on December 5, R. H. Ashton, president of the Chicago & North Western and chairman of the Central Department Committee of the Railroads' War Board, reminded his hearers that the freight situation is just as unsatisfactory to the railroads as to the shippers. During 60 per cent of the time between the years 1907 and 1916 there were surpluses of freight cars ranging as high as 400,000 cars, and as late as August, 1915, the surplus was 250,000 cars. When our own country became involved in war the railroad managers immediately realized that there would be thrust upon them a gigantic task and they took heroic steps to meet the issue by forming the Railroads' War Board and co-ordinating their efforts, with what wonderful results is well known. Continuing, he said:

"Some people think the results accomplished by the railroads under this one directing body an argument for government ownership, but the vast transportation interests of this country could have done no more nor accomplished any more efficient results if they were owned by the government, or by anybody else. Furthermore, our government at this time has plenty of

vast problems to solve without adding the transportation system to its burden.

"The railroads are not the only industry in the country that cannot meet the demands on it. The farmer cannot produce all the grain and livestock needed to feed our people and our allies. The mines are not producing all the coal required. The steel industry's output is not equal to the demand from the government and private concerns; the railroads are obliged to get along without rails, cars and locomotives which they greatly need. . . ."

A Railroad President's Experiences

The New York American prints a column interview with Charles S. Mellen, former president of the New York, New Haven & Hartford, in which Mr. Mellen gives his views on government ownership of railroads and other things. He says that the managers of roads, the employees, the public and the stockholders are all dissatisfied. All have just grievances, and there is no possible solution except government ownership. Continuing, he said:

"Railroad employees are entitled to more pay. Advances in wages have not kept pace with the increases in the cost of necessities. It is going to take something like the strong arm of the Government to deal with the army of railroad employees. Under Government ownership there will be no more strikes on the railroads than there are in the army and navy, or post office. In fairness to the railroads, let it be said that, while they are restricted as to the amount they can charge for service, there is apparently no roof to the prices they must pay.

"The great government which trains men at West Point and Annapolis for the Army and the Navy can train men to run the railroads. Five years ago I thought the public altogether too impatient. Today I wonder at its patience!

"Why is it that when a man becomes rich in the grocery or banking business nothing else will do but he must become a director in a railroad? . . . I believe the government will make a success of railroading. The Naval Academy at Annapolis and the Military Academy at West Point will continue to turn out men trained in the handling of men. A good place to keep these men busy in times of peace will be the government-owned railroads. I understand very well that one of the stock objections to government ownership is that there will be too much graft. There will be no more in the government service than there is today. Is that a strong statement? Get a list of the railroad directors of America. See how many of them have their friends, and their sons, and their friends' sons, or other relatives, in good positions on the railroads. Many of them have been railroad directors for no other purpose!

"Moreover, the banker who sits on the board of directors of a railroad, who participates in any syndicate controlling the new securities of that road, should be compelled to buy the securities on the terms offered to all other bankers. The terms should never be secret. As it is today, one set of bankers refuses to interfere with the graft of another set of bankers. It is all secret and everything is done under a gentlemen's agreement. I have seen the terms of a certain proposed loan discussed by the board of directors of a railroad, even before the loan itself was authorized. There must be radical revision in our requirements of railroad directors. The director must not be permitted to dodge his responsibility by the plea, when things go wrong, that he depended upon this man or that man; that he employed an expert and trusted him implicitly.

"Two-thirds of the plans and schemes of railroad boards never originate with railroad presidents at all. They originate in the board, and if they are apparently proposed by the president it is because some director with power has asked him to do so.

"Will big railroad men be glad to work for Uncle Sam? Why not? It will be infinitely better than working for a coterie of bankers. Under government ownership there will not be so much politics in the conduct of our railroads as there is today. There will be no more nepotism. There will not be any more graft. I do not apprehend any great difficulty, although it is likely that many railroad presidents will have their salaries reduced. The people will hardly stand for paying their railroad presidents a salary larger than that of the President of the United States. But lower salaries for railroad presidents will not be an unmitigated evil.

"Those who oppose government ownership say the managers of the roads would be susceptible to influence by members of

Congress, or members of the Cabinet. That there will be some influence of this sort is likely true, but it will not be a flea bite to the influence exerted today by railroad directors—directors who do not direct but who, because of their great wealth and the great wealth they represent, have the power to get things through.

"Under government ownership I believe the railroads of the United States will be run with more of an eye to efficiency and with a smaller degree of subservency to one thousand and one masters than is the case today. . . ."

Western Railway Club

The Western Railway Club will hold a meeting on December 17 at the Hotel Sherman, Chicago. W. J. Bohan, mechanical engineer on the Northern Pacific, will present a paper on "The Box Car," and A. M. Schoyer, resident vice-president of the Pennsylvania Lines at Chicago, will speak informally.

American Society of Civil Engineers

The sixty-fifth annual meeting of the American Society of Civil Engineers will be held at the new headquarters of the society, 33 West 39th street, New York, on January 16-17, 1918. Annual reports will be read, officers will be elected for the ensuing year and other business will be transacted.

MEETINGS AND CONVENTIONS

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

- AIR BRAKE ASSOCIATION.—F. M. Nellis, Room 3014, 165 Broadway, New York City.
- AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontious, 455 Grand Central Station, Chicago.
- AMERICAN ASSOCIATION OF DRIVING CAR SUPERINTENDENTS.—H. C. Boardman, D. L. & W. Hoboken, N. J.
- AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, Illinois Central, Chicago, Ill.
- AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York.
- AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Hartman, Room 101, Union Station, St. Louis, Mo.
- AMERICAN ELECTRIC RAILWAY ASSOCIATION.—E. B. Burritt, 8 W. 40th St., New York.
- AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOCIATION.—Fred C. J. Dell, 165 Broadway, New York.
- AMERICAN RAILROAD MASTER TINNERS', COFFERSMITHS' AND PIPEFITTERS' ASSOCIATION.—W. E. Jones, C. & N. W., 3814 Fulton St., Chicago. Convention for 1917 postponed.
- AMERICAN RAILWAY ASSOCIATION.—J. E. Fairbanks, general secretary, 75 Church St., New York.
- AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Next annual meeting, October, 1918, New York.
- AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next annual meeting, March 20-22, 1918, Chicago, Ill.
- AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, 1112 Krider Bldg., Chicago.
- AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—Owen D. Kinsey, Illinois Central, Chicago.
- AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.
- AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st Monday and Wednesday in month, except July and August, 220 W. 57th St., New York.
- AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.
- AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Ancier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January 22-24, 1918, Hotel Sherman, Chicago.
- ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—E. R. Woodson, Room 1116-B, Woodward Bldg., Washington, D. C. Next annual meeting, St. Louis, May, 1918.
- ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Semi-annual meeting with Master Car Builders' Association.
- ASSOCIATION OF RAILROAD CLAIM AGENTS.—Willis H. Failing, Terminal Station, Central of New Jersey, Jersey City, N. J.
- ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago.
- ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—W. L. Connelly, Superintendent of Telegraph, Indiana Harbor Belt, Gibson, Ind.
- ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 75 Church St., New York.
- BRIDGE AND BUILDING SOCIETY.—Association.—C. E. Ward, U. S. Wind & Pump Company, Batavia, Ill. Meetings with American Railway Bridge and Building Association.
- CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert, Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.
- CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.
- CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, 1115 W. 31st St., Chicago.
- CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.
- CHIEF INTERCHANGER CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—W. R. McMunn, New York Central, Albany, N. Y.
- CINCINNATI RAILWAY CLUB.—H. Boutet, Chief Interchange Inspector, Cincinnati, 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 568 Union Arcade Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Traffic Manager, R. F. & P. Richmond Va.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, C. H. & D. Lima, Ohio.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—J. G. Crawford, C. B. & O. R. R., 702 E. 51st St., Chicago. Next convention, May, 1918, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1126 W. Broadway, Winona, Minn.

INVESTMENT BANKERS' ASSOCIATION OF AMERICA.—Frederick R. Fenton, 11 W. Montrose St., Chicago.

MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 15-17, 1918, Chicago.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—A. P. Dane, R. & M., Reading, Mass.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, 1112 Karpen Bldg., Chicago.

PEORIA RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 30 Church St., New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial Annex Hotel, Pittsburgh.

RAILWAY DEVELOPERS' ASSOCIATION.—D. C. Welty, Commissioner of Agriculture, St. L., Iron Mt. & So., 1047 Railway Exchange Bldg., St. Louis. Next annual convention, May, 1918, Houston, Tex.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—J. Scribner, 1063 Monahan Block, Chicago. Meetings with Association of Railway Electrical Engineers.

RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, Office of the President's Assistant, Seaboard Air Line, Norfolk, Va.

RAILWAY REAL ESTATE ASSOCIATION.—R. H. Morrison, Assistant Engineer, C. & O., Richmond, Va.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, N. Y. C. R. R., Box C, Collinwood, Ohio.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 2136 Oliver Bldg., Pittsburgh, Pa. Meetings with Master Car Builders' and Master Mechanic's Association.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 50 Church St., New York. Meetings with Association of Railway Telegraph Superintendents.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Club has been suspended until after the war.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September 17-19, 1918, Auditorium Hotel, Chicago.

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

SALT LAKE TRANSPORTATION CLUB.—R. E. Rowland, David Keith Bldg., Salt Lake City, Utah. Regular meetings, 1st Saturday of each month, Salt Lake City.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—L. W. Cox, N. Y. & W., Philadelphia, Pa.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. R. R., Atlanta, Ga.

SOUTHERN & SEABOARD RAILWAY CLUB.—A. J. Merrill, Grant Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.

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

TRAFFIC CLUB OF CHICAGO.—C. B. Signer, La Salle Hotel, Chicago.

TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7122 Stewart Ave., Chicago. Next annual convention, June 18, 1918, Grand Rapids, Mich.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Gen'l Ag't, Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings bi-monthly, Pittsburgh.

TRAVELLING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio.

UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

WESTERN ASSOCIATION OF SHORT LINE RAILROADS.—Clarence M. Oddie, Mills Bldg., San Francisco.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

WESTERN SOCIETY OF ENGINEERS.—Edgar S. Nethercut, Secretary, 1735 Monadnock Block, Chicago, Ill. Regular meeting, first Monday in month, except January, July and August. Extra meetings generally on other Monday evenings except in July and August.

Traffic News

A total of 1,845,689 troops had been moved by the railroads up to December 2, according to reports received by the Railroads' War Board.

R. S. Lovett, director of priority in transportation, has denied a report that he is contemplating an order shutting off a supply of cars from the automobile industry.

In its first year of operation the Panama Limited, the Illinois Central's 23-hour train between Chicago and New Orleans, was 99 per cent on time. Out of 365 trips ending on November 14, 1917, the train was late only four times. Continuously, for a period of 3½ months it was on time.

Shortage of cars is said to have produced serious congestion in the rice belt of Texas, Louisiana and Arkansas, especially in the latter state. Shippers in Arkansas are said to have still in their warehouses 400 carloads of rice which has been sold, but which the railroads cannot take away.

The Great Lakes Transit Corporation and the Northwestern Steamship Company, acting on the request of the Food Administration, have agreed to operate their vessels until December 12 and longer if the weather conditions permit. A new vessel, just completed at a dock on the lakes, is to carry a cargo of flour direct from Duluth, by way of the St. Lawrence River, to New York City.

In Philadelphia, last week, at a conference of railroad men and merchants, called because of serious complaints of shortage of coal, it was said that that city would need 23,000 tons of coal a day for the next 40 days. The representative of the Pennsylvania Railroad said that 2,245 carloads of freight, some domestic and some for export, consigned to the government, had been unloaded on the ground in and near Philadelphia because of lack of vessels for water transportation.

The governor of Ohio, appealing last week to the Fuel Administration at Washington for transportation relief, reported that three-fourths of the state institutions in Ohio were out of coal; that the manufacturer of airplanes in Dayton had 100 cars of coal stalled on side tracks between West Virginia mines and Dayton; that carloads of coal were detained on nearly every railroad side track in the state, and that at Hobson, Meigs county, such cars had been standing since October 1. The governor further gave specific locations of about six thousand cars of coal said to be stalled on various railroads.

Gradual improvement in the transportation difficulties involving shipments of coal by rail to Detroit and other points in the northern middle west is reported by the United States Fuel Administration. This movement was halted by embargoes placed on western shipments at Cincinnati and other Ohio gateways. The Fuel Administration called the attention of the operating committee of the eastern railroads to this accumulation of coal and the embargo on all coal over the Cincinnati division of the Big Four was at once lifted. The embargo on shipments over the Cincinnati, Hamilton & Dayton was lifted on December 4.

R. S. Lovett, director of transportation priority, on November 29 amended and extended priority order No. 4, issued on November 22, to provide that until further order railroads in Texas, New Mexico, Louisiana, Oklahoma, Arkansas, Kansas and Missouri shall give preference and priority in transportation to all shipments of cottonseed cake, cottonseed meal, hay, rice, straw, hulls and forage for all points in Texas and New Mexico from Texas, Louisiana, Oklahoma, Arkansas, Kansas and Missouri over all other traffic, except livestock and perishables, human foodstuffs, railroad supplies and material, coal and shipments for the government.

According to the reports of the Geological Survey, a slight decrease marked the production of bituminous coal during the week ended November 24. The total production is estimated at 11,260,490 net tons. This was .6 per cent less than the output during the preceding week, but the production for the month remains higher than at any time since early July. Anthracite

shipments amounted to 42,936 cars, the largest mark attained since the week of September 1. During the week ended November 17 representative operators produced 75.5 per cent of their combined full time capacity as limited by the labor forces at present available. Of the 24.5 per cent of what may be termed potential production which they failed to realize, 19.2 per cent was reported as lost for lack of cars. Inadequate transportation, the report says, thus remains the great limiting factor in the bituminous industry.

Food Administration Orders Preferential Movement of All Grain

Through the efforts of the Chicago Car Service Committee of the Railroads' War Board, the Chicago Board of Trade and other organizations, the federal food administration has modified its order requiring preferential movement of wheat, so as to include all grains. A large share of this year's corn crop contains an unusual amount of moisture and is in danger of spoiling unless promptly shipped to the large elevators having facilities for drying the corn. So long as the "priority order" gave preference to wheat shipments, the transportation of corn was necessarily delayed, and an immense amount of corn was in danger of spoiling. In anticipation of a very heavy movement of corn the Chicago Car Service Committee has now appealed to the War Board to order box cars sent West.

Consolidation of European Government Export Functions

France, Italy, England and Russia have established an office at 165 Broadway, New York, to centralize their requests for modification of embargo permits. It is called the "Traffic Executive." This step has been taken, at the request of the railroads' war board, to relieve the railroad embargo offices from the needless congestion resulting from thousands of requests for modification permits, the majority of which are duplications. When permits are desired for traffic consigned to Comptroller Johannet for account of the French government, General Tozzi for account of the Italian government, Connop Guthrie for account of the British government or C. G. Medzikovsky for account of the Russian government, the modification will now be made direct to the "Traffic Executive," who in turn will make application to the railroad company. It is expected that this centralization of authority will tend to relieve the over-burdened railroad and commercial telegraph lines.

Thanksgiving Traffic at Camp Devens

At Camp Devens, Ayer, Mass., for the Thanksgiving vacation, about 20,000 soldiers were granted leave of absence, and the Boston & Maine ran 18 special trains for their accommodation. The furloughs extended from 6 o'clock Wednesday evening until 6 o'clock Friday morning, but in view of the probable scarcity of passenger cars for some of the Thanksgiving traffic, the military authorities consented to let some of the men off earlier; and the special trains from the camp started at different hours from 11 a. m. to 6 p. m. The total number of passengers carried by the road from Ayer station and from the camp for the holiday was 18,117; and of these 14,774 were taken on the special trains within the hours named. Trains were run to Boston; to Troy, N. Y.; Concord, N. H.; Pittsfield, Mass.; Portland, Me.; Providence, R. I.; New Bedford, Mass.; Stamford, Conn., and Bellows Falls, Vt.

Counting now only the mileage on Boston & Maine rails, nine specials were run to Boston, 36 miles; four to Worcester, 28 miles; four to Concord, N. H., 57 miles; one to Salem, Mass., 40 miles; one to Portland, Me., 116 miles; one to Concord Junction, 14 miles, and one to Troy, N. Y., 154 miles. Practically all of the cars for use in these trains had to be run to Ayer from Boston, so that for the engines and for the men it meant 72 miles added to each run. For points on the New Haven and the Boston & Albany the cars were run through—some of them as far as Stamford, Conn. For the longest trip, that to Troy, N. Y., the special left Ayer at 12:45 p. m., arriving at Troy at 5:45 p. m.

The special trains started on their return trips Thursday evening; from Boston between 5:55 p. m. and 3:20 a. m. (Friday); from Concord, N. H., Thursday at 9 p. m.; from Pittsfield, Mass., at 7; Portland, Me., at 8:15; Providence, R. I., at 10:50; Stamford, Conn., at 7:40; Troy, N. Y., at 10 o'clock. The trains from the more distant points were scheduled to arrive at Ayer between 11 p. m. and 3 a. m.

Of all the passengers leaving the camp about 9,000 were carried to Boston, whence a large percentage made use of regular trains to points on other divisions of the Boston & Maine. The entire movement was made without serious delay and without accident.

Railroads Urged to Move Fertilizers Promptly

"Fertilizer isn't usually recognized as a factor in war, but it may prove an important one, nevertheless," says R. H. Aishton, chairman of the Central Department of the Railroads' War Board. "Our own fighting men and those of our allies are looking to this country for food supplies, and so is the civilian population of this and our allied countries. We must produce more food than ever; must plant a larger acreage and should aim to increase the average yield per acre. This means the use of more fertilizer; and notice has been sent to every railroad to provide for the prompt transportation of fertilizer and for the ingredients of manufactured fertilizer, such as phosphate rock, ground limestone, potash, gypsum, certain acids and other commodities. Notice has also been sent to all railroads that, on account of the shortage of leather, where animals are killed on railroads the hides should be saved. Some roads have made a practice of doing this but others have not."

Curtailement of Passenger Service

The Broadway Limited, the twenty-hour passenger train between New York and Chicago over the Pennsylvania, has been discontinued; this at the request of the Pittsburgh operating committee of the eastern roads, to facilitate the better movement of freight traffic.

The New York Central and the Pennsylvania have discontinued the observation cars on all New York-Chicago limited expresses. The same is true of the Empire State express of the New York Central and the "St. Louisan" of the Pennsylvania.

The Pennsylvania announces that on all trains between New York and Philadelphia, which have a Pullman smoking car (hitherto run for the accommodation of passengers holding seats in parlor cars) seats in such cars will henceforth be charged for; that is to say, the passenger paying for a single seat must elect whether he will ride in the parlor car or in the smoking car.

Heavy Passenger Traffic on the Pennsylvania

Except as limitations may be placed on the traffic as a war measure the Pennsylvania does not contemplate any general reductions in passenger service, said President Rea in a statement issued just before the General Operating Committee for the eastern roads ordered the discontinuance of the Broadway Limited.

"Less passenger train service on the eastern railroads, and especially on the Pennsylvania system, would be very desirable," he said, but "the Pennsylvania has about the largest passenger traffic of any railroad in the country. The year 1916 was the heaviest in its history, and passenger revenue for the first nine months of 1917 has increased 18 per cent over 1916, while later returns show that it is increasing at the rate of 30 per cent over 1916.

"Any traveler on this system can see for himself on day and night trains the extraordinary increase in passenger travel, including the heavy family travel to and from camps and to and from Washington on government business. I doubt whether slower and longer trains carrying full loads would materially relieve the tracks and terminals. Therefore, at this time I can see no other course than to continue meeting the abnormal demand for passenger transportation to the best of our ability."

The Philadelphia, Baltimore & Washington, the main line of the Pennsylvania System between Philadelphia and Washington, 137 miles, now earns about one-fifth of the entire passenger earnings of the whole Pennsylvania system. For the month of October its passenger revenues amounted to \$1,384,001; while the total passenger receipts on the whole system for that month were \$5,991,240. For the ten months ending with October, passenger receipts were on the P., B. & W. \$11,038,944, and on the whole Pennsylvania system, 12,000 miles, \$55,031,756. Twelve or fifteen extra sleeping cars are used on the trains from New York to Washington almost every night; and, altogether, the sleeping car service between these two cities requires about 150 cars, not counting those which start from Philadelphia.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The Interstate Commerce Commission has suspended until April 4 tariffs containing proposed increases in rail and lake class and commodity rates.

Procedure Under Fifteenth Section

The Interstate Commerce Commission on December 4 issued a notice to all carriers saying that since the fifteenth section amendment became effective carriers have in some instances filed tariffs containing rates issued in compliance with an order of the commission and also including increased rates or charges not authorized by and having no connection with the commission's order. If such a tariff were accepted by the commission the terms of the amended fifteenth section would not have been complied with. If the tariff were rejected by the commission the order of the commission would not have been complied with.

Aside from the question of orderly procedure important questions of law are involved when a carrier tenders for filing such a schedule, the commission says. It may therefore be doubted if an increased rate or charge filed without approval of the commission would be "in effect." If it would not, the old rate would still be in effect and any departure therefrom would be a violation of section 6 and subject the offender to the penalty fixed therein for violation thereof.

The notice also says that if an increased rate or charge filed without approval of the commission does not lawfully change the previously existing rate or charge, willful failure on part of the carrier to observe the previously existing rate or charge "until changed according to law" would be a violation of the Elkins Act. It is important that the provisions of the amended fifteenth section be strictly observed and complied with, and the commission hopes that neither further admonition nor resort to more drastic action will be necessary in any instance.

Suspension Docket Almost Discontinued

The amendment of the fifteenth section of the commerce law, requiring carriers to secure approval in advance from the Interstate Commerce Commission before they can file a tariff containing an increased rate, appears likely to result in a practical abolition of the suspension docket because proceedings involving increased rates are being settled before, instead of after the filing of tariffs. Since the amendment became effective carriers had filed up to December 1 a total of 2,005 applications for permission to file tariffs containing an increased charge, a very large proportion of them being of a minor character, such as changes to correct errors. The commission had issued orders approving or rejecting the applications bearing numbers up to 146, although, as they are not strictly consecutive, the number of orders that has actually appeared is somewhat less, probably in the neighborhood of 125. Many of these orders, however, covered a large number of applications and many of the applications were made a part of the supplemental advanced rate case. A suspension order was issued on December 4, but before that the last suspension order issued was on November 14, and the latest before that were on October 27 and October 9, whereas formerly there used to be an average of nearly one a day.

STATE COMMISSIONS

The New York State Public Service Commission, first district, has authorized the Long Island Railroad to advance from 2 cents a mile to 2.25 cents a mile its price for mileage tickets; and has disapproved applications for a number of increases in the rates on single trip tickets. The commission declares that the railroad has not shown in sufficient detail the reasonableness of the proposed advances. Commissioner Hervey, who wrote the opinion, says that there will be an increase in revenues in the near future, which the company had underestimated, and that the increase in cost of service may not be so great as is claimed.

PERSONNEL OF COMMISSIONS

Fred W. Putnam, whose appointment as a member of the Minnesota Railroad & Warehouse Commission was announced in the *Railway Age Gazette* of November 16, was born at Red



F. W. Putnam

Wing, Minn., on November 15, 1883. He graduated from the University of Minnesota and completed a course in law at the University of Michigan. Following his graduation from the latter school he returned to Minnesota to enter the office of the state attorney-general. He was later associated with the law firm of Keith, Evans, Thompson & Fairchild, and at the time of his appointment was a member of the law firm of Green & Putnam, of Red Wing, Minn. He was appointed a member of the commission to succeed Charles E. Elm-

quist, who resigned after a service of nine years to become a solicitor of the valuation committee of the National Association of Railway and Utility Commissioners with headquarters at Washington, D. C.

Charles Webster, whose appointment as a member of the Iowa State Board of Railroad Commissioners was announced in the *Railway Age Gazette* of November 16, was born at Waucoma,



C. Webster

Ia., on May 18, 1859. He was first employed as a station agent and telegraph operator at Waucoma, and then engaged in farming and stock-raising. He was for a number of years interested in the construction and financing of telephone companies and also in public utilities in Arizona. At the present time he is president of four chains of lumber yards operating in Iowa, North Dakota, South Dakota and Montana, and is a member of the firm of Webster Brothers, dealing in lumber, grain and a wholesale egg business in Waucoma.

He is also president of the Northwestern Lumbermen's Association, with headquarters at Minneapolis, which has members in the states of Iowa, North Dakota, South Dakota and Minnesota. Mr. Webster is a member of the State Council of Defense of Iowa and was appointed federal fuel administrator before assuming the position of railroad commissioner. He will continue to discharge his duties as fuel administrator as well as those of railroad commissioner.

COURT NEWS

Derailment by Sand on Crossing

A locomotive became derailed at a highway crossing by striking a pile of sand and gravel, and the fireman was injured. In an action against the railroad the evidence failed to show how the sand and gravel came to be there any length of time before the accident. The Minnesota Court held that the rule of *res ipsa loquitur* had no application, as the crossing was not in the exclusive possession or control of the railroad. The evidence did not justify an inference of negligence on the part of the railroad.

—McGillivray v. Great Northern (Minn.), 164 N. W., 922. De- (Pa.), 102 Atl., 141. Decided June 30, 1917.

Contributory Negligence of Pedestrian at Crossing

In an action for personal injury from falling on ice accumulating on a sidewalk at a grade crossing, it appeared that the ice was the only ice in the locality and could be seen for over six feet. Plaintiff could have seen it had she looked, but she failed to do so. The Pennsylvania Supreme Court held that a nonsuit was properly entered on the ground of her contributory negligence. One walking along a traveled highway must observe where and how he is going so as to avoid dangers which ordinary prudence would disclose.—Kleckner v. New Jersey Central (Pa.), 102 Atl., 141. Decided June 30, 1917.

Tort of Intoxicated Railroad Employee

The Vermont statute, P. S. 4506, makes railroads liable for damages which are sustained by reason of an operator, etc., who uses intoxicating liquors as a beverage to the knowledge of any of the officers of the road. The Vermont Supreme Court, in an action for damages due to the defendant railroad's agent shooting the plaintiff holds that as the evidence failed to show that either the defendant's president, superintendent, or one of its directors knew that the agent used intoxicating liquors as a beverage, a verdict was properly directed for the defendant.—Staten v. Central Vermont (Vt.), 102 Atl., 97. Decided October 2, 1917.

"Transportation" of Interstate Shipments of Live Stock

The Texas Court of Civil Appeals holds that, in view of section 1 of the Interstate Commerce Act, defining "transportation" to include services in connection with the receipt and delivery of the shipment, etc., the duty to deliver an interstate shipment of live stock to the commission company to which it was consigned was nondelegable, and where delivery could not be made in the pens of the consignee the duty of transportation was not fulfilled by delivery at the chutes of the stockyard company, which placed them in inaccessible pens having no facilities for feed or water.—Panhandle & Santa Fé v. Phillips (Tex.), 197 S. W., 1031. Decided October 17, 1917.

Directors' Power as to Receiverships

The federal district court in Massachusetts holds that the board of directors of a railroad, with the approval of the majority of the stockholders, has power to initiate proceedings looking to a receivership, by procuring the filing of a bill by a bona fide creditor, the allegations of which are admitted for the company, and there is no impropriety in such proceeding, where the directors act in good faith, solely for the interests of the company, and in view of its duty to the public as a common carrier. The court, however, is not absolutely bound to appoint a receiver. It might refuse to do so if confident that there was no real necessity for such action and that the application was improvidently made. The facts in the present instance indicated that this was not such a case.—Intercontinental Rubber Co. v. Boston & Maine, 245 Fed., 122. Decided February 26, 1917.

Limitation of Two Years for Action Under Federal Liability Act

The federal employers' liability act prescribes a limitation of two years from the time the cause of action arises for bringing action. In an action by an employee brought a few months after the injury the complaint stated a cause of action under the common law and statutes of the state of New York, and stated no fact bringing the action under the federal statute. After two trials had been had, and the case had been carried to the appellate courts by several appeals, and remanded for a new trial, the plaintiff moved for permission to amend his complaint, setting up the claim that at the time of the accident the plaintiff was engaged in interstate commerce and therefore entitled to the benefit of the federal act. This was not done until eight years after the happening of the accident. The New York Supreme Court, Special Term, Erie County, holds that the limitation of two years prescribed by the federal act applied, and a new trial would not be allowed on the amended complaint, as it would state a new cause of action under the federal act.—Kinney v. New York Central, 166 N. Y. Supp., 868. Decided July 1, 1917.

Equipment and Supplies

FREIGHT CARS

THE MOTOR FUEL COMPANY, Sapulpa, Okla., is inquiring for 10 8,000-gal. capacity tank cars.

THE LOUISVILLE & NASHVILLE is inquiring for 300 steel underframes for 50-ton gondola cars.

THE UNITED STATES NAVY has ordered 10 40-ton gondola cars from the American Car & Foundry Company.

THE JOHNSON OIL REFINING COMPANY, Chicago, is in the market for 10 to 50 8,000 to 10,000-gal. capacity tank cars.

THE PENNSYLVANIA EQUIPMENT COMPANY, 1420 Chestnut street, Philadelphia, is in the market for 100 8,000-gal. capacity tank cars for lease.

THE ROMA WINE COMPANY, San Francisco, Cal., has purchased 4 10,000-gal. capacity tank cars from the Pennsylvania Tank Car Company.

THE GENERAL PETROLEUM COMPANY, Los Angeles, Cal., has purchased 4 10,000-gal. capacity tank cars from the Pennsylvania Tank Car Company.

THE POWER GASOLINE COMPANY, Bradford, Pa., has ordered one 8,000-gal. capacity all steel tank car from the Pennsylvania Tank Car Company.

THE UNION PACIFIC order for freight cars as given in last week's issue was incorrect. The company's 3,550 cars were distributed as follows: 1,000 stock cars, American Car & Foundry Company; 1,000 hopper bottom coal cars, Pullman Company; 50 caboose cars, Mount Vernon Car Manufacturing Company; 500 flat cars, Bettendorf Company, and 1,000 drop bottom gondola cars, Cambria Steel Company.

SIGNALING

THE WABASH has ordered from the General Railway Signal Company material for an interlocking plant of 35 levers at Illes, Ill.

THE PENNSYLVANIA has ordered from the General Railway Signal Company a Saxby & Farmer interlocking, 12 levers, for Lalor street, Trenton, N. J.

THE UNION PACIFIC is to install a mechanical interlocking plant at Republican River Bridge; Saxby & Farmer machine, six levers. The material has been ordered from the General Railway Signal Company.

THE MISSOURI, KANSAS & TEXAS has ordered from the Union Switch & Signal Company, to be installed by the railroad forces, a mechanical interlocking for the crossing of the St. Louis-San Francisco at Clinton, Mo.

THE ATCHISON, TOPEKA & SANTA FE has ordered from the Union Switch & Signal Company, to be installed by the railroad forces, a twenty-lever mechanical interlocking for Morris, Kan. The levers will have a c. electric locks.

THE LOUISVILLE & NASHVILLE has ordered from the General Railway Signal Company, to be installed by the railroad company's forces, the material for automatic block signals on its line (single track) from Jackson, Ky., to Oakdale, Ky., 9 miles.

THE GREAT NORTHERN proposes next Spring to erect automatic block signals on its line (single track) from Blackfoot, Mont., to Summit, 34 miles; from Essex, Mont., to Columbia Falls, 42 miles and from Troy, Mont., to Bonner's Ferry, 31 miles, a total of 107 miles. The signals and material for this installation were ordered from the General Railway Signal Company, as noted in the *Railway Age Gazette* of November 2, page 821. The signals are one-arm, upper quadrant, 10-volt direct-current, with the mechanism at the top of the mast. This installation will require about 700 relays, 1,500 lightning arresters, and other materials in proportion.

Supply Trade News

Lewis A. Larsen, assistant comptroller of the American Locomotive Company, has resigned to accept the position of assistant to the president of the Lima Locomotive Works, Inc., effective



L. A. Larsen

December 1, 1917, with headquarters at Lima, Ohio. Mr. Larsen was born at Ridgeway, Ia., in 1875. He received his early education in the public schools of Ridgeway and Decorah, Ia., and Upper Iowa University, Northwestern University and St. Paul College of Law. In November, 1897, he entered the service of the Chicago Great Western as clerk to the master mechanic. He held successively the positions of chief clerk to the superintendent of motive power and chief clerk to the assistant general manager. In 1904 he resigned to accept the position of chief clerk to the superintendent of motive power of the Northern Pacific at St. Paul. In November, 1906, he became associated with W. H. S. Wright, railway supplies, representing the Railway Steel Spring Company, the Pittsburgh Forge & Iron Company and other companies, and in 1907 entered the service of the American locomotive Company. In 1909 he was appointed assistant to the vice president in charge of manufacturing, and July, 1917, was appointed assistant comptroller. For several years past Mr. Larsen has been a special lecturer in the Alexander Hamilton Institute, New York. He has also contributed a number of papers to the railroad magazines.

A Locomotive an Hour

Production records at the Baldwin Locomotive Works are being broken weekly. It is reported that in a recent week about 100 locomotives of various sizes were turned out, and President Alba B. Johnson is authority for the statement that the plant is completing a locomotive an hour.

President Johnson at the recent directors' meeting also said: "During 1916, 1,960 locomotives were made, an average of 160 a month. Large contracts for machining shells were executed and a considerable portion of the force, which ranged from 12,000 to 18,500 men, was diverted to shell manufacturing. All of these contracts except one, for the French Government, were run out during the spring of 1916. The French contract was completed in November. In 1917 the working force was increased approximately to 20,000 men. Locomotive production was largely increased and for ten months ending October 31, 1917, 2,254 were shipped, at the rate of 225 a month. This increase of production will be continued during November, December and the months of 1918.

"While our earnings have been satisfactory, the increase in production and increased cost of materials and labor have demanded a large increase in the amount of working capital as the conditions have been unfavorable for any financing. There has been no alternative but to provide the increased working capital by borrowing.

"Continued increasing activity is likely to require a continuation of all the capital at present employed. The directors have wisely decided that it is inexpedient to increase the loans in order to provide means for dividends on the common stock. At no time in the history of the works has there been so large an amount of business upon the books. All shell business has been transferred to the Eddystone Munitions Company. The work under contract should prove profitable and gives promise of satisfactory earnings during the succeeding year."

Economies Devices Corporation and Franklin Railway Supply Company Merged

With a view to concentrating into one organization two groups of men who have been working along parallel lines in the development of increased efficiency of the steam locomotive, the Economies Devices Corporation and the Franklin Railway Supply Company have been merged into a new corporation, namely, the Franklin Railway Supply Company, Inc.

The officers of the new company will be as follows: J. S. Coffin, chairman of the board of directors; S. G. Allen, vice-



J. S. Coffin

chairman; H. F. Ball, president; Walter H. Coyle, senior vice-president; J. L. Randolph, vice-president in charge of western territory; C. W. Floyd Coffin, vice-president in charge of Eastern and Southern territory; C. L. Winey, secretary and treasurer; Harry M. Evans, Eastern sales manager; C. J. Burkholder, Western sales manager; Hal R. Stafford, chief engineer, and William T. Lane, mechanical engineer.

Joel S. Coffin, chairman of the board of directors of the new company, brings to the new company a wide and

varied knowledge gained from 14 years of railroad work and 26 years in the railroad supply field. He began as a machinist's apprentice and became fireman, engineer and road foreman of engines. Most of this experience was on the Wisconsin Central. He left the railroad to enter the mechanical department of the Galena Signal Oil Company as mechanical expert, was promoted to manager of that department and several years later was elected vice-president. After serving as vice-president for two years, he resigned to accept the vice-presidency of the American Brake Shoe & Foundry Company, which position he held until 1911. In 1902 he organized the Franklin Railway Supply Company, of which he was president up to 1916, when he was elected chair-



S. G. Allen

man of the board. In addition to being chairman of the board of directors of the Franklin Railway Supply Company, Inc., Mr. Coffin is a director in a large number of other corporations. Samuel G. Allen, vice-chairman of the Franklin Railway Supply Company, Inc., is both a lawyer and a business man. He was plunged into business responsibilities immediately after leaving college, and studied law in his spare time. He was admitted to the bar in Warren County, Pa., and practiced for nine years in the oil districts of Pennsylvania. When the

Franklin Railway Supply Company was formed in 1902, Mr. Allen was elected secretary and treasurer, and later became vice-president, and in 1916 was elected president. H. F. Ball, president of the Franklin Railway Supply Company, Inc., has spent his entire business life in intimate contact with locomotive operation and construction. After serving his time in the locomotive and car departments of the Pennsylvania Railroad at Altoona, he entered the drafting room, and two years later entered the service of the Lake Shore & Michigan Southern as chief draftsman. He held successively the posi-

tions of general foreman car shops, general car inspector, mechanical engineer and superintendent of motive power. He resigned from the Lake Shore to become vice-president in charge of engineering of the American Locomotive Company, which position he occupied until 1913, when he left the company to become president of the Economy Devices Corporation.

Walter H. Coyle, senior vice-president of the Franklin Railway Supply Company, Inc., brings to his new position experience gained by many years in both railroad work and the railroad supply field. Mr. Coyle was for 11 years in the service of the Erie Railroad in the mechanical and traffic departments. Upon leaving the railroad he became identified with the Kent Manufacturing Company, and later entered the mechanical department of the Franklin Railway Supply Company. He spent six years in this department, when he was called to New York as assistant to the vice-president and placed in charge of the sales department of the central territory. He was elected second vice-president shortly after, and then vice-president, which position he held up to his election as senior vice-president of the new organization.

J. L. Randolph, vice-president of the Franklin Railway Supply Company, Inc., takes charge of the western territory, with office in Chicago. Mr. Randolph began as a machinist apprentice in the Concord, N. H., shops of the Northern Railroad, now a part of the Boston & Maine. Subsequently he served this road in the capacity of machinist, gang foreman, general foreman, master mechanic and superintendent of shops. He left the railroad to accept a position in the mechanical department of the Franklin Railway Supply Company. Three years later he was appointed sales manager of the Economy Devices Corporation, and in 1916 was elected vice-president.

C. W. Floyd Coffin, vice-president of the Franklin Railway Supply Company, Inc., takes charge of the eastern-southern territory, with office in New York. Mr. Coffin's entire business experience has been in the railroad supply field. After leaving Cornell University he spent five years in the treasury, sales and service departments of the Franklin Railway Supply Company. He was then transferred to Chicago as assistant western sales manager, and

later promoted to western sales manager, which position he held up to the time of his appointment as vice-president of the Franklin Railway Supply Company, Inc.

C. L. Winey, secretary and treasurer of the Franklin Railway Supply Company, Inc., is a man of extended experience both in railroad work and in the railroad supply field. Starting his career on the Pennsylvania Railroad, he spent three years in the motive power department, one year in the maintenance of way and signal department, and two years in the transportation department. He left railroad work to enter the service of the Gal-na Signal Oil Company, and five years later accepted the position of secretary and works manager of the Kent Manufacturing Company. In 1908 he was elected secretary and treasurer of the Franklin Railway Supply Company, which position he held until he was elected secretary and treasurer of the Franklin Railway Supply Co., Inc.

Harry M. Evans has been appointed eastern sales manager of the Franklin Railway Supply Company, Inc., with office in New York. Mr. Evans began railroad work as a call boy on the Erie, and served in various positions in the mechanical, transportation and traffic departments of that road. Upon leaving the Erie he entered the mechanical department of the Franklin Railway Supply Company, as traveling representative. He was promoted to assistant western sales manager, and shortly after was made eastern sales manager, which position he held at the time of his recent appointment as eastern sales manager of the Franklin Railway Supply Company, Inc.

C. J. Burkholder has been appointed western sales manager of the Franklin Railway Supply Company, Inc., with office in Chicago. Up to 1916 Mr. Burkholder's business experience had been entirely in railroad work. He was employed in the round-house of the Pennsylvania Railroad at Tyrone, Pa.; and later was a locomotive fireman. Leaving the Pennsylvania R. R., he became a locomotive engineer on the Union Pacific, and later on the Kansas City Southern. He was in turn promoted to traveling engineer, trainmaster, general road foreman of engines and division superintendent. In 1916 he accepted a position with the Economy Devices Corporation as mechanical representative in the western territory, which position he occupied up to his present appointment.

Hal R. Stafford, chief engineer of the Franklin Railway Supply Company, Inc., has for the past 17 years been active in locomotive development. On leaving college he started as a special machinist with the Schenectady Locomotive Works, shortly afterward was transferred to the drawing room. A year later he took charge of the cylinder and valve division. Eight years later he was made assistant to the consulting engineer in charge of Compound Locomotives. While in this position he helped develop the first Mallet locomotive, the Cole balanced compound and the Cole-Stafford balanced simple locomotive. For some years he represented the American Locomotive Company, conducting road tests jointly with various railroads. When the



H. F. Ball



C. W. F. Coffin



W. H. Coyle



J. L. Randolph



C. L. Winey

Economy Devices Corporation was formed he was appointed mechanical engineer of that company.

William T. Lane, mechanical engineer of the Franklin Railway Supply Company, Inc., has spent his entire business career in the railway supply field. For the past six years he has been constantly in touch with locomotive development. On leaving college he went as an apprentice with the Franklin Portable Crane & Hoist Company. His next position was as draftsman. In the Franklin Railway Supply Company, then Chief Draftsman. In 1915 he was made mechanical engineer.

Axil A. Storm, vice-president of the Pettibone, Mulliken Company, and president of the U. S. Ball Bearing Co., Chicago, died in New York November 29.

L. B. Moses, since 1911 sales manager of the Kettle River Company, Minneapolis, Minn., has been elected second vice-president of the Walter A. Zelnicker Supply Company, and will be in charge of the rail department of the company at its main offices in St. Louis, Mo.

TRADE PUBLICATIONS

OXY-PINTSCH METAL CUTTING.—An attractive eight-page booklet has been issued by the Pintsch Compressing Company, 2 Rector street, New York, describing the model "C" Oxy-Pintsch cutting equipment furnished by this company. This booklet sets forth the advantages of Pintsch gas for metal cutting and contains a brief description with illustrations of the various parts of its complete outfit. This includes an oxygen pressure regulator, high and low pressure Pintsch gas regulators, the use of which depends upon whether the gas is drawn from flasks or from low pressure service pipe lines, and the cutting torch.

DOWN AND BACK—A RAILROAD STORY.—A book of 52 pages, 5½ in. by 8 in. in size with 7 illustrations. In this book, issued by the Pneumatic Scale Corporation, Ltd., Norfolk Downs, Mass., in the interest of its pilferproof collapsible steel container, Sam tells of his and Bob's departure into the express business, very successful at first, of their unsuccessful experience with weak containers and of their deep seated desire for a stronger package as exemplified in the container made by the Pneumatic Scale Corporation. Bob and Sam, in the interesting story that Sam tells, entered upon the express business because they realized the waste of having to go to town for Old Man Sanborn's general store, that is going with an empty wagon and returning with Sanborn's supplies, while the nail-mill truck went with a load of nails into town and came back empty. Then, as time went on they had to figure out classifications for charges, and finally got up against a rule prohibiting the return of empty containers free of charge and against the weaker containers that as a result were made so weak that they barely lasted out the trip, let alone a return. It got so, says Sam that "It don't take much of a sneeze to make the average shippin' case collapse, anyway." Previous to that almost the only trouble they had had was with oil. As the new grocer said the day they delivered him a couple of barrels of sugar, "He didn't object to the sugar tastin' of oil, it kind of gave it a new flavor, but he did object to findin' that barrel of oil we brought had soaked up so much sugar." The story is interspersed with many other such touches and its author finds opportunity to bring up many of the other difficulties resulting from frail containers, theft, loss and damage, difficulty of loading cars to capacity with goods in frail containers, etc. References from articles in some of the technical magazines, from court cases and decisions, etc., inserted in the pages show Sam's bases in serious fact. On the whole, the book is well gotten up and takes an honorable position among trade publications of this character.

ITALY NEEDS 800,000 TONS OF COAL to run its railroads, munition factories and war industries. Italy's coal supply is so short that during the past summer more than one thousand square miles of forests were cut for use as firewood and in the preparation of charcoal. More than 500,000 tons of lignite was mined, both wood and lignite being used at present industrially, also on slow trains and switch locomotives. It is impossible to use such material for passenger trains, which have been under great pressure for months due to military movements.

Railway Construction

FRANKFORT & SHELBYVILLE ELECTRIC.—Surveys are now being made to build an electric line from Frankfort, Ky., west to Shelbyville, 19.7 miles. The headquarters of the company are at Louisville Trust building, Louisville, Ky.

HOUSTON, RICHMOND & SAN ANTONIO INTERURBAN.—This company was organized to build from Houston, Texas, west to San Antonio, 186 miles, surveys have been made from San Antonio east via Gonzales for 100 miles and from Houston west to Brazos river, 30 miles, and grading work has been completed on 30 miles. E. Kennedy, president, Houston.

KETTLE VALLEY.—This company will build a line from Princeton, B. C., south along the Similkameen river to Copper mountain, about 14 miles. The line will serve copper mines owned by the Canada Copper Corporation. Contracts for grading and bridge work will be let the early part of this month. The work involves about 50,000 cu. yd. of grading per mile, of which 40 per cent will be solid rock; it will have a maximum grade of 2.2 per cent and maximum curvature of 14 deg. One bridge will be built over the Similkameen river, a number of trestles will be constructed, and four tunnels will be bored totaling in length about 1,200 ft. The construction of the bridges and trestles will involve the use of 2,000,000 ft. b. m., of timber. A. McCulloch, chief engineer, Penticton, B. C.

LEHIGH VALLEY.—The Lehigh Valley, the Pennsylvania and City of Newark, N. J., are jointly building a steel and timber temporary bridge over the Lehigh Valley and Pennsylvania tracks at Bay avenue, Newark, to eliminate a grade crossing. The Lehigh Valley carried out part of the work with company forces and Henry Steers has the contract for the Pennsylvania's share of the work. The total cost of about \$75,000 is to be paid jointly by the railroads and the City of Newark.

NASHVILLE, CHATTANOOGA & ST. LOUIS.—This company is building with its own forces the extension from Coalmont, Tenn., to new mines of the Tennessee Consolidated Coal Company at the head of Mill creek. The grading is about 80 per cent completed and six miles of track has been laid. The work involves handling about 28,000 cu. yd. to the mile 80 per cent of which is rock work. There will be two stations on the line which is being built to carry coal. (January 19, p. 124.)

INCREASED PASSENGER RATES ON MEXICAN RAILWAY.—The Secretary of Communications and Public Works has authorized the manager of the Mexican Railway, in compliance with the petition made by the company, to put into effect, beginning on November 1, 1917, the 25 per cent increase in the passenger rates. The proceeds of this increase, as in the case of the one granted to the Mexican Electric Tramway Company, is destined for the benefit of the Federal Treasury.—*Commerce Report.*

FRENCH PLANS PROGRESSING TO MAKE PARIS A SEAPORT.—Consul General Thackara at Paris reports: Periodical agitation has arisen since the seventeenth century in favor of uniting Paris with the sea in a way so as to render the connecting river or canal navigable to ships of large size. Since the flood of 1910 the problem has acquired a fresh interest. But the outbreak of the present war has caused the scheme to present itself to municipal and national authorities as one of capital importance, inasmuch as the inadequate port facilities and means of communication have militated strongly against the revictualing of the Paris region on reasonably favorable terms. On December 30, 1916, the city council invited the prefect of the Seine to prepare "a technical, administrative, and financial prospectus for the realization of the port of Paris," at the same time requesting the Provincial Government to "constitute a committee with the object of studying the organization and the financial régime to be applied to the port of Paris." The prefect of the Seine on March 23, 1917, reported progress along these lines. Preliminary studies were made by government commissions appointed on February 9, 1910, and January 14, 1911, respectively. On the basis of these the investigation is continuing.

Railway Financial News

CANADIAN PACIFIC.—Preliminary returns of gross earnings for November show that a new high record for any month in the company's history has been established. The weekly statements for November give a gross of \$14,942,000, and it is probable, when the usual adjustments are carried, the monthly statement will top \$15,000,000 by a good margin. The previous high record for a month was \$14,733,774.

CHICAGO & ALTON.—See Missouri Pacific.

MICHIGAN CENTRAL.—The Illinois Public Utilities Commission has summoned the Michigan Central management to appear before it, December 11, in Chicago, to show cause why it issued \$4,000,000 notes and other securities without the commission's authority.

MISSOURI PACIFIC.—Negotiations are under way between the managements of the Chicago & Alton and Missouri Pacific for the rental of ninety miles of track of the latter road by the former. The stretch of track desired is that between Kansas City, Mo., and Norton.

NEW YORK & PENNSYLVANIA.—This road, which operates between Canisteo, N. Y., and Ceres, 56 miles, has been sold to Gustave Benjamin, of the Benjamin Iron & Steel Company, Buffalo, N. Y., for a price in the neighborhood of \$350,000. The road will be junked unless people who live along the line raise sufficient money to buy it from the new owner.

OKLAHAWKA VALLEY.—The Florida Railroad Commission is conducting hearings at Ocala, Fla., on the petition of this company to cease operations and discontinue the line. The road extends from Ocala, Fla., to Palatka, 54 miles. Officials of the company showed that the road is operating at a great loss, the deficit this year being over \$18,000.

PENNSYLVANIA RAILROAD.—The directors of the Pennsylvania Railroad Company and of the Pennsylvania Company have agreed, subject to the consent required from some of the state commissions, to transfer the leases and other operating agreements of the western lines, now held by the Pennsylvania Company, to the Pennsylvania Railroad Company. The latter company will then directly operate the lines now operated by the Pennsylvania Company, and the present experienced organization west of Pittsburgh, will continue to conduct the operations of the western lines, in the name of the Pennsylvania Railroad Company. The Pittsburgh, Cincinnati, Chicago & St. Louis Railroad Company is not included in the foregoing arrangement. All of the capital stock of the Pennsylvania Company is owned by the Pennsylvania Railroad Company, and all of its bonds are guaranteed by the latter company. Under the plan suggested, the capital stock of the Pennsylvania Company will ultimately be surrendered and cancelled, excepting such amount as may be deemed essential to preserve the charter of the Pennsylvania Company, until it is decided to dissolve it.

The Pennsylvania Company was incorporated under the laws of Pennsylvania in 1870, with the powers of a holding company as well as a railroad company, to take charge of the management and development for the Pennsylvania Railroad Company of the several lines west of Pittsburgh leased or owned by the latter company, notably the Pittsburgh, Ft. Wayne & Chicago, the Erie & Pittsburgh, the Cleveland & Pittsburgh and various other lines. Following the policy pursued by the Pennsylvania Railroad Company, the Pennsylvania Company is now to be taken over by the former company, to eliminate unnecessary duplication and to give its lines the additional strength and credit of the parent company, i. e., the Pennsylvania Railroad Company.

See also editorial elsewhere in this issue.

WASHINGTON, POTOMAC & CHESAPEAKE.—A petition has been filed in the Circuit Court at Hyattsville, Md., for the dissolution of the charter of this company, whose tracks extend from Brandywine, Md., to Mechanicsville, a distance of 21 miles.

Railway Officers

Executive, Financial, Legal and Accounting

J. P. Pelham has been appointed acting auditor of the Alabama Northern with office at Atlanta, Ga., vice W. E. Hix, resigned.

Charles H. Ewing, general manager of the Philadelphia & Reading, has been appointed vice-president, with headquarters at Philadelphia, Pa.

Announcement is made by the Pennsylvania Railroad that in connection with the change in the status of the lines of the northwest system (see Financial News) the vice-presidents, officers and employees of the Pennsylvania Company have been appointed to similar positions with the Pennsylvania Railroad Company, effective January 1, 1918, and will discharge the same duties as those now performed for the Pennsylvania Company in the management and operation of these western lines. The titles of the new vice-presidents are now as follows: J. J. Turner, senior vice-president, with general supervision over all departments of the western lines; E. B. Taylor, vice-president in charge of finance and accounting; D. T. McCabe, vice-president in charge of traffic; G. L. Peck, vice-president in charge of operation; Benjamin McKee, vice-president in charge of real estate and purchases. They will continue to be located in the company's general office at Pittsburgh.

Operating

J. B. Hutchinson, Jr., who has been appointed superintendent of the Tyrone division of the Pennsylvania Railroad, with headquarters at Tyrone, Pa., as has already been announced in these columns, was born on March 3, 1876, at Bristol, Pa., and was educated in Princeton University. While attending college he worked for the Pennsylvania Railroad during his summer vacations, and on January 1, 1898, was appointed rodman. In April, 1899, he was transferred to the office of the principal assistant engineer at Altoona, Pa., the following November he was made assistant supervisor on the West Penn division, and in 1900 he was transferred to the Pittsburgh division. He was promoted to supervisor on the West Penn division in 1901, and in 1905 was transferred to the Middle division in the same capacity. In January, 1910, he was appointed division engineer of the West Jersey & Seashore Railroad and three years later was transferred to the Williamsport and Susquehanna divisions of the Pennsylvania. He was appointed division engineer of the Monongahela division on February 11, 1914, and in September, 1916, was transferred to the Pittsburgh division in the same capacity. In April, 1917, he was promoted to assistant superintendent of the Pittsburgh division and on October 25 was made superintendent of the Tyrone division, as above noted.

W. T. Peyton has been appointed assistant general superintendent of the Fort Worth & Denver City and the Wichita Valley Railway, with office at Fort Worth, Texas.

E. L. Hill, an assistant in the engineering department of the Erie Railroad at New York, has been appointed assistant to general manager, with headquarters at New York.

J. C. Clark has been appointed assistant to the general manager of the Oregon Short Line, in charge of safety first work, with headquarters at Salt Lake City, Utah, effective November 26.



J. B. Hutchinson, Jr.

Homer Whitlock, train despatcher on the Peoria & Eastern division of the Cleveland, Cincinnati, Chicago & St. Louis, has been promoted to assistant trainmaster at Springfield, Ohio, succeeding H. B. Perry, who has enlisted in the army.

P. N. Place, superintendent of the Scranton division of the Delaware, Lackawanna & Western, with office at Scranton, Pa., has resigned, and F. J. Lawrence, trainmaster at Scranton, has been appointed acting superintendent, with headquarters at Scranton.

F. M. Falck, assistant general manager of the Philadelphia & Reading, has been appointed general manager, with headquarters at Philadelphia, Pa. A portrait of Mr. Falck and a sketch of his railway career were published in the *Railway Age Gazette* of April 20, 1917, page 857.

John Sesser, whose appointment as assistant general superintendent of the Great Northern, with headquarters at Great Falls, Mont. was mentioned in these columns on October 26, was born



J. Sesser

at Plantation, Hilo, Hawaii; 1901 to 1902, resident engineer on the Chicago, Milwaukee & St. Paul, and for a short time during the latter part of this period chief engineer of the Iowa & St. Louis; 1902 to 1907, he was resident and locating engineer with the Chicago, Burlington & Quincy, locating and constructing a 60-mile extension from Centralia, Ill., to Herrin, and as engineer maintenance of way of the Missouri district. From 1907 to 1908 he was vice-president of the W. A. Kenly Company, Chicago. In December, 1909, he entered the service of the Great Northern as trainmaster, and in April, 1910, was promoted to assistant engineer maintenance of way of the system. In July, 1913, he was promoted to superintendent of the Kalispell division, with headquarters at Whitefish, Mont. In October, 1915, he was transferred to the Missabe-Superior division, with headquarters at Superior, Wis., which position he held until his appointment as assistant general superintendent, central district, effective October 20.

M. B. Lamb, assistant superintendent of the Chicago, Burlington & Quincy, with headquarters at Dayton's Bluff, Minn., has been promoted to superintendent, with headquarters at Hannibal, Mo., succeeding J. H. Aydelott, who has been transferred to Omaha, Neb., as superintendent of the Omaha division. G. L. Griggs, division superintendent at Omaha, Neb., has been transferred to the Alliance division, with headquarters at Alliance, Neb., succeeding W. M. Weidenhamer, resigned. O. C. Hibbs, trainmaster at Galesburg, Ill., has been promoted to assistant superintendent, with headquarters at Dayton's Bluff. The above changes were effective December 1.

Traffic

J. L. Bacon has been appointed commercial agent of the Central of Georgia, with office at Albany, Ga., vice W. F. Brown, promoted.

John S. Talbot has resigned as general traffic manager of the Evansville & Indianapolis and the office of general traffic manager has been discontinued.

F. A. Adams, chief clerk in the freight department of the Rock Island Lines at Fort Worth, Texas., has been appointed assistant general freight agent, with headquarters at Chicago.

E. J. Dowie, special agent in the industrial department of the New York Central, has been appointed industrial agent, with headquarters at Cleveland, Ohio, effective November 22.

W. E. Lowes, assistant general passenger agent of the Baltimore & Ohio, has been appointed general passenger agent of the system with headquarters at Baltimore, Md. He began railway



W. E. Lowes

work as a call boy and messenger in the superintendent's office of the Indianapolis & Vincennes, now a part of the Pittsburgh, Cincinnati, Chicago & St. Louis. He later served as telegraph operator and station agent of the Indianapolis, Cincinnati & Lafayette, now a part of the Cleveland, Cincinnati, Chicago & St. Louis. He was subsequently freight claim clerk and chief clerk of the freight department of the Pittsburgh, Cincinnati, Chicago & St. Louis at Indianapolis, Ind., and then became advertising agent of the Cleveland,

Cincinnati, Chicago & St. Louis, at Cincinnati, Ohio. In 1897 he went to the Baltimore & Ohio as advertising manager and in 1910 he was made assistant general passenger agent, from which position he is now appointed general passenger agent of the Baltimore & Ohio system, as above noted.

W. T. LaMoure, general freight agent of the Boston & Maine, has been appointed freight traffic manager, with office at Boston, Mass., to succeed the late A. S. Crane. Mr. LaMoure was born



W. T. LaMoure

at Worcester, N. Y., and was educated in the public school of his native town. He began railroad work in 1882, as a telegraph operator on the Boston, Hoosac Tunnel & Western, now a part of the Boston & Maine. In 1885 he was appointed station agent at Petersburg Junction, N. Y. One year later he was transferred to Valley Falls, and then became agent at Johnsonville, when the Boston, Hoosac Tunnel & Western was consolidated with the Fitchburg Railroad. In 1892 he was appointed freight agent of the Fitchburg Railroad, at

Troy, N. Y.; three years later he was transferred to Boston as chief clerk of the local freight office, and two years later became local freight agent in charge of the Boston freight terminals of the Fitchburg Railroad, and continued in that position after the Fitchburg was leased to the Boston & Maine. In 1907 he was appointed foreign freight agent, and in January, 1914, was appointed assistant general freight agent of the Boston & Maine. In July, 1915, he became general freight agent, which position he held at the time of his appointment as freight traffic manager of the same road, as above noted.

R. S. Clark, commercial agent of the Tennessee Central, has been appointed assistant general freight agent, with office at Nashville, Tenn., and A. E. Yardley, commercial agent at St. Louis, Mo., has been appointed assistant general freight agent,

with office at Nashville, Tenn. The commercial agencies at Chicago, St. Louis, Mo., Atlanta, Ga., and Knoxville, Tenn., have been abolished.

Archibald Fries, freight traffic manager, eastern lines, of the Baltimore & Ohio, with headquarters at Baltimore, Md., has been appointed assistant general freight manager in charge of freight traffic of the system. He was born on February 27, 1864, and was educated in the public schools at Cincinnati, Ohio. He began railway work in 1880 as an entry clerk on the Ohio & Mississippi now a part of the Baltimore & Ohio System in the transfer station at Storr's, Ohio, and subsequently served consecutively as cashier and chief clerk at the same place. From January, 1890, to November, 1897, he was successively chief clerk, rate and claim clerk, accountant, chief clerk and acting manager of the Continental Fast Freight Line; then to October, 1898, he was chief clerk in the general freight department of the Baltimore & Ohio Southwestern. In October, 1898, he was appointed general agent at Cincinnati, and in January, 1899, he became assistant general freight agent of the same road. From March, 1911, to January, 1913, he was also assistant general freight agent of the Cincinnati, Hamilton & Dayton. In January, 1913, he was appointed general freight agent of the Sharpsville Railroad; the same year he was appointed general freight agent of the Baltimore & Ohio at Pittsburgh, Pa., and on October 15, 1916, was appointed freight traffic manager of the eastern lines, with headquarters at Baltimore, and now becomes assistant general freight manager, as above noted.

Walter B. Calloway, general passenger agent, eastern lines, of the Baltimore & Ohio, with office at Baltimore, Md., has been appointed passenger traffic manager. He was born on December 28, 1873, at Harrison, Ohio, and was educated in the public schools at Home City, Ohio, also at Wabash College, Crawfordsville, Ind. He began railway work in September, 1891, as office boy in the freight claim department of the Cleveland, Cincinnati, Chicago & St. Louis, and subsequently served consecutively in various positions in the passenger department of the same road. He was then division clerk in the general passenger department of the Cincinnati, Hamilton & Dayton and later was chief rate clerk in the general passenger department of the same road. In January, 1901, he was appointed advertising manager of the same department and from June, 1902, to August of the following year, was assistant general passenger agent of the Cincinnati, Richmond & Muncie. He later served as general passenger agent of the Chicago, Cincinnati & Louisville, and from November, 1904, to December, 1905, he was assistant general passenger agent of the same road and the Cincinnati, Hamilton & Dayton. He was then to March, 1911, general passenger agent of the C., H. & D., and later served as assistant general passenger agent of the Baltimore & Ohio



A. Fries



W. B. Calloway

Southwestern and the C., H. & D. until September 1, 1911, when he was appointed general passenger agent of the same roads. In the fall of 1916 he was appointed general passenger agent of the Baltimore & Ohio, eastern lines, with headquarters at Baltimore, Md., and now becomes passenger traffic manager, as above noted.

O. P. McCarty, passenger traffic manager of the Baltimore & Ohio, with headquarters at Baltimore, Md., has been appointed general passenger representative, and Golden Shumate, assistant general freight agent, with headquarters at Baltimore, has been appointed general freight agent. A portrait of Mr. Shumate and a sketch of his railway career were published in the *Railway Age Gazette* of March 16, 1917, page 470.

Engineering and Rolling Stock

E. S. Pearce has been appointed mechanical engineer of the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Beech Grove, Ind., succeeding W. E. Ricketson, promoted.

T. S. Davey, shop superintendent of the Erie at Buffalo (N. Y.) car shops, has been appointed master mechanic in charge of engine terminals at Croton, N. J., and L. C. Fitzgerald, car foreman, succeeds Mr. Davey.

W. W. Lemen has been appointed superintendent of the motive power and car departments of the Denver & Rio Grande, with headquarters at Denver, Colo., vice W. J. Bennett, resigned, and W. O. Cook, general road foreman, has been appointed assistant superintendent motive power and car departments, with headquarters at Denver, Colo. (Burnham station). The office of general road foreman has been abolished, but the duties of the position have been assumed by Mr. Cook.

J. A. Delaney, master mechanic of the Rio Grande division of the Texas & Pacific, with headquarters at Alexandria, La., has been transferred to Big Spring, Tex. W. H. Keller, master mechanic at Big Spring, has been transferred to the Ft. Worth Division, with headquarters at Ft. Worth, Tex., relieving G. W. Deats, who has been appointed traveling supervisor of fuel and oil. W. L. McMurry, an engineer on the Ft. Worth division, has been appointed supervisor of fuel on the Rio Grande division, with headquarters at Big Spring, Tex.

R. E. Lee, acting manager of the mining and fuel department of the Chicago, Rock Island & Pacific, has been appointed manager of the mining department with jurisdiction over mines and mining operations, with headquarters at Chicago. The purchase, inspection and distribution of the company fuel will be under the jurisdiction of F. D. Reed, general purchasing agent. C. T. Winkless, superintendent of fuel, is transferred to the purchasing department, reporting to Mr. Reed. The conservation of fuel used in locomotives, stationary plants and pumping stations will be under the supervision of the mechanical department. The operation and maintenance of coal chutes will be under the jurisdiction of the transportation department and directly in charge of the division superintendent. The above reorganization became effective December 1.

Purchasing

H. M. Dewart has been appointed assistant purchasing agent of the Central Vermont, with office at St. Albans, Vt.

Railway Officers in Military Service

H. B. Perry, assistant trainmaster of the Cleveland, Cincinnati, Chicago & St. Louis at Springfield, Ohio, has enlisted in the army.

OBITUARY

David L. Middleton, commercial agent of the Lehigh Valley died from heart disease in his office in New York City on November 30.

Alexander S. Thweatt, general eastern passenger agent of the Southern Railway system, died on December 4, at his home in New York, at the age of 56.

Clinton White, former railroad commissioner of Massachusetts, died at his home in Melrose, Mass., November 25, at the age of 73. Mr. White was appointed a member of the railroad commission in 1901 and continued on that board, and its successor, the Public Service Commission, until 1915.

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Volume 63

December 14, 1917

No. 24

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Slacker "is a useful expression designed to describe a person or institution derelict or negligent in the discharge of certain duties toward his government or country," says C. M. Larson, engineer of the Railroad Commission of Wisconsin, in a letter printed elsewhere in this issue. Mr. Larson objects strongly to applying it to states that, prescribing by law a two-cent passenger rate on intrastate business, place the burden of unprofitable passenger service rendered to its citizens on the citizens of other states. It is the merest quibble to say that Wisconsin permits charging a higher passenger rate for roads earning less than \$3,500 gross per mile. The Illinois Central, which heads Mr. Larson's list, operates about 100 miles in Wisconsin and runs two passenger trains each way each day over this mileage. The out-of-pocket cost of operating these trains, together with maintenance of way expenses and maintenance of passenger equipment expenses, would amount to over \$2,000 per mile, leaving less than \$1,500, even with three-cent passenger fares, for operation and maintenance of freight trains and equipment and interest charges. Even Wisconsin cannot get blood out of a turnip and need take no credit to herself for that fact. One of the vital needs that is being brought home by the war to every thinking man in the country is the necessity of an adequate and evenly developed transportation system. Two-cent-passenger-fare state legislation has done much to render this impossible, but past selfishness does not make a state a slacker; it is continuance in this attitude in the face of a national crisis that makes an "institution derelict . . . in the discharge of . . . duties towards its . . . country."

Derelict in the Discharge of Its Duties

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Fairfax Harrison, chairman of the Railroads' War Board, has issued a bulletin to the railroads suggesting that during the period of heavy passenger traffic the use of official and private passenger cars should be limited in order to relieve overburdened passenger trains and that no such cars be handled, either in free or pay service, except for the accommodation of railroad officers when traveling on necessary railroad business. This is a matter which ought not to require sug-

gesting more than once. The Interstate Commerce Commission in its decision in the five per cent rate case made a similar suggestion to the railroads as a measure of economy. It is especially pertinent at this time when not only passenger traffic is heavier than ever before, but the railroads are overtaxed in almost every direction and are straining every nerve to handle the necessary traffic of the country. After the roads have done everything they have felt possible in the way of reducing unnecessary passenger service, particularly branch line and local service, it does not help them in the eyes of the public to handle any more private cars than necessary. Of course, there is a sharp distinction, which the public does not usually appreciate, between the official car which is the railroad officer's traveling office, and which is indispensable on many occasions, and the private cars used by various persons who can afford to pay for them or who are allowed free transportation, including the families of directors and officers, and who use them for the sake of luxury and exclusiveness rather than for business reasons. Everyone who has accompanied railroad officers on important trips, for example, knows that their cars are in no sense "private" but are as much a workshop as the office at headquarters and not only enable the railroad man to keep up his office work while on the road but are often occupied by a dozen or more people who ride a short distance with him for conference. Such cars are just as necessary in these times as in any others, if not more so; but the same facts do not apply to the private cars whose use by the occasional parasites on the railroad organization are responsible for the public criticism of all so-called "private" cars.

If our freight trains could be run at 12½ miles an hour where now they are run at 10 miles an hour, the cars would be one-fifth less time on the road and "there would be one-fourth more cars available for service at all times." This remarkable bit of economic wisdom comes from the Honorable William C. Adamson, representative in Congress, and putative author of the "eight-hour law" for trainmen. It is found in an interview in the New York Tribune of December 2. Mr. Adamson has resigned his seat in Congress and is to take a government position in New York City to which President

Mr. Adamson and His Law

Adamson, representative in Congress, and putative author of the "eight-hour law" for trainmen. It is found in an interview in the New York Tribune of December 2. Mr. Adamson has resigned his seat in Congress and is to take a government position in New York City to which President

Use of Private Cars In War Time

Fairfax Harrison, chairman of the Railroads' War Board, has issued a bulletin to the railroads suggesting that during the period of heavy passenger traffic the use of official and private passenger cars should be limited in order to relieve overburdened passenger trains and that no such cars be handled, either in free or pay service, except for the accommodation of railroad officers when traveling on necessary railroad business. This is a matter which ought not to require sug-

Wilson has appointed him; and this interview may perhaps be intended as his farewell address to the people of the country. The fact that freight cars average only about two hours a day on the road (spending the other 22 hours in yards or shops) reduces his calculated increase in car supply about 90 per cent, and makes in his pleasing picture a slight dent which, evidently, he had not thought of. That an increase in speed of trains would reduce the income seriously, because of the necessary lightening of the load, is another fact; and this would neutralize the remaining ten per cent of the supposed savings. This, also, the congressman may have forgotten, though he has been told it often enough. Mr. Adamson's interview indicates that he is a victim of misplaced confidence. He got his law passed (ostensibly) to aid the trainmen in getting shorter hours, but he finds now that "the railroads, every one of them, have agreed with the employees to run the same hours as before. . . . They seem to forget that the operating officers and the employees are compounding a felony." It must be truly depressing to find that the trainmen are as wicked as the capitalists whom they work for. In one little item of the interview there is a bit of light; Mr. Adamson has told President Wilson that there is no need of an investigation by the Goethals committee concerning the operation of the "eight-hour" law. The facts are well enough known already. This ought to mean a saving of government money. Mr. Adamson has varied troubles. He says "In San Francisco I found myself sitting next to a railroad president at a banquet, and he began sniping at me with complaints about the eight-hour law. I asked him if his road had ever paid any attention to it, other than paying the men overtime, and he admitted it had not." Sniping is, indeed, an underhanded method of calling a congressman to account. Such tactics are in marked contrast to the above-board methods of the trainmen when they sat in the Congressional galleries with their stop watches in their hands, on the occasion of the passage of the Adamson law.

The report of the Committee on Railroad Securities of the Investment Bankers' Association of America contained a suggested form for a standard railroad annual report to stockholders. The form combines the good features to be found now in various companies' reports and contains some suggestions for information to be given to stockholders which so far as we know no company is now including in its annual report. In one particular at least, however, the information called for is not as complete as it should be. This is in regard to depreciation. The form suggested for annual reports calls for a statement of the rules and rates which the company used to determine the amounts charged to operating expenses for depreciation, which is good so far as it goes. A specific statement should also be included showing the percentage of the original cost which has been written off through depreciation for each class of equipment. It is, of course, now possible to make a rough estimate by comparing the total credit through depreciation with the book value of the equipment as shown on the balance sheet, but a statement showing specifically the percentage of cost of locomotives, of freight cars, of passenger cars, etc., which has been written off would be of great value. The practice of different roads in regard to the method of figuring depreciation of equipment when partial renewals are made, etc., is in many instances very complicated, and while the companies have to stand ready to justify whatever system they use before the Interstate Commerce Commission, this does not help the layman stockholder to form an opinion as to how ample depreciation charges are. Furthermore, a company ought to state in its annual report specifically whether the amounts charged for depreciation are set aside or are used in the purchase of bonds for sinking fund or of

new equipment, or as is now generally the case, simply a part of general assets, no more readily available for use in buying new equipment than are any of the other general assets. If a board of directors had to state specifically that the average years in service of all their locomotives was 20, and that only 25 per cent of the original cost of these locomotives had been written off through depreciation, and that this depreciation was a book charge only and that if new equipment had to be bought next year funds would have to be borrowed to pay for it, it would have a salutary effect in preventing such a condition from existing.

THE IMPENDING GOVERNMENT CONTROL OF RAILROADS

AT the time this editorial is being written the railroads of the United States are passing through the most important crisis in their history. The determination as to whether they shall continue to be operated under the direction of the Railroads' War Board or their management shall be delegated to some government officer or board is entirely in the hands of President Wilson. The indications are that control of operation through some government board or official will be undertaken.

It is worth while at this time when the fate of the railroads during the war is hanging in the balance to inquire, first, why serious consideration is being given to government operation and, second, what results, if any, probably can be secured under government operation which could not be obtained under private operation directed by the Railroads' War Board.

* * *

If the government assumes control it will not be because the railroads have "broken down" or because the War Board has failed. The railroads have handled this year 15 per cent more freight business than they did last year, and during the first six months after our country entered the war they handled 50 per cent more business than in the same months of 1915. That does not indicate any "break down." The same facts which show that they have not broken down also demonstrate that the Railroads' War Board has not failed. It was appointed to operate the railways as a single system in order to enable them to handle the maximum practicable business.

Commissioner McChord, in his dissent from the special report on the railroad situation which the majority of the Interstate Commerce Commission sent to Congress last week, tried to show that the Railroads' War Board had not succeeded in operating the railways as a single system and that no voluntary railroad committee could do so. The evidence he cited in the case of the War Board is the measures adopted to relieve the congestion in eastern territory. But this was trying to prove that the War Board was not doing the very thing the evidence he cited showed it was. Nobody, we suppose, assumed last April when the railways agreed to operate as a single system, that all the measures necessary to carry out this plan would be adopted instantly. It was to be expected that needed measures would be adopted as conditions showed the need of them. This is what has been done. First, box cars were pooled. Next all freight handled in connection with the construction of the cantonments was divided between the different railways and moved over the lines of least resistance. Next, the same principles were applied in the handling of troops and of supplies for the troops. Finally, when the congestion developed in eastern territory further measures were adopted to apply the same general principles. The effort of the War Board has been to pool railway equipment and service, *in so far as necessary*, to move the maximum traffic.

In order to handle more traffic it will be necessary to secure still greater co-ordination in the operation of the

facilities of the various railways, and this, sooner or later, will make desirable and even necessary the use of methods not conforming to existing laws. For this reason, as the *Railway Age Gazette* began pointing out editorially some weeks ago, and as the Interstate Commerce Commission pointed out in its special report to Congress last week, the suspension of the Sherman anti-trust law and the anti-pooling law is extremely desirable. Furthermore, railway equipment is being worn out, and if efficiency is to be maintained and increased, the least that must be done is to let the roads get enough new facilities to replace those being worn out. But because the War Board has not done everything at once—because to enable it to secure the greatest efficiency it is desirable that certain laws be suspended, and that means be provided for enabling the railways to maintain and enlarge their facilities—it does not follow that the Railroads' War Board has failed. On the contrary, it has done wonders.

The government has created various agencies in Washington to deal with new conditions resulting from the war. The *Railway Age Gazette* asserts, as a result of careful observation both in Washington and elsewhere, that the Railroads' War Board, up to the present, has accomplished far more in the direction of helping win the war than any agency which the government itself has created since this country entered the war. And yet it is now proposed to set aside the Railroads' War Board, or at least subordinate it.

* * *

Why is this step probably going to be taken? The reasoning which has prevailed in Washington runs as follows: The operation of the railways should, in the interest of the highest efficiency, be left in the hands of their present managers. But the laws which interfere with securing their greatest efficiency should be suspended or repealed and the government should in some way help the railways to provide the facilities which they require for replacements and to increase their capacity, and should give them its support in one form or another in securing the earnings and the new capital required for this purpose. Now,—so this reasoning runs—as long as the railways are left to the management of their own officers Congress will refuse to suspend restrictive laws or to enact any legislation for the purpose of giving them loans or guarantees of any kind. Therefore, the government, in order to get Congress to do its duty in the matter, must assume control of operation.

The Railroads' War Board has met this argument by saying, in a statement to Senator Newlands, that the railroads do not at present ask a suspension of the Sherman anti-trust law or the anti-pooling law, and that they will not need government loans or guarantees if the Secretary of the Treasury and the Federal Reserve Board will co-operate with them in raising new capital on the railways' own credit. The railways would welcome suspension of restrictive laws and the aid of government loans or guarantees if these things could be secured without throwing the whole railroad question into the maelstrom of politics; but their managers feel that they can work out the problem of securing maximum efficiency without the suspension of the laws or government loans, and that it would be better for the country to let them do this than either to throw the whole railroad question into Congress or to appoint a government railway administrator.

Why does the belief prevail that Congress, in spite of the fact that the Interstate Commerce Commission has practically recommended it, will refuse to suspend restrictive laws or give the railways any financial aid, direct or indirect, so long as the railways are left in the hands of their own managers? We have asked that question in Washington within the last few days of many people, and a great majority have made the same answer. That answer has been "politics." We have made the interesting discovery that business men, government people and newspaper correspondents in Washington have the poorest opinion of Congress which obtains

in any part of the United States. Down there they always assume that under any and all conditions, in dealing with any and all questions, Congress will be governed, not by public considerations but solely by political considerations. The reasoning there about the railway situation is that Congress would not think it good politics to leave the railways in the hands of their own managers and at the same time give them any assistance by the suspension of restrictive laws, by loans or otherwise. But, it is argued, the railways must be given some kind of government help. Therefore, there must be created some government authority to supervise their operations so that Congress can be induced to give them the necessary aid. All of which is not very complimentary to Congress; but, as already said, it is the reasoning that is prevailing in Washington.

Of course, the doctrinaire advocates of government ownership do not reason thus. They believe that the adoption of government operation would result in an increase of efficiency and thus bring government ownership nearer. But the number of persons who reason thus in Washington seems to be small. It is generally understood that President Wilson himself is opposed to government ownership; and that even though he should decide in favor of government operation he would regard it merely as a war measure, to be abandoned at the end of the war.

* * *

Since some form of government operation or at least of government supervision of operation seems probable, the question naturally arises as to what will be gained and what will be lost by it. The Railroads' War Board has publicly gone on record with the opinion that government operation could not result in any increase in the efficiency of the use of existing railway facilities which could not be secured without it. The ablest railway managers in the country have for months devoted all their energy and ability to operating the existing facilities with the greatest practicable efficiency. To assume that any railway officer, merely because he was clothed with governmental authority, could accomplish more than they have is absurd, and to suppose that any man without experience in railroad management, even though clothed with governmental authority, could accomplish as much as they have, is equally absurd.

There is very great danger that the adoption of government operation will result in a serious reduction, rather than in any increase, of railroad efficiency. Railway officers, no matter how patriotic, are likely to feel disappointment and chagrin if the government takes control. It tells them, in effect, that they have failed and that the government does not trust them. The effect may be to impair, and even seriously impair, the official morale. A government railway administrator, if free from restrictive laws and enabled to raise and spend money where the railway managements have been unable to raise and spend it, might be able to do some important things which the railway managements have not been able to do. But any advantages which might result from these things would not be secured for months, while the effects of the impairment of the official morale would be felt at once and might easily continue to be so serious as to more than nullify the effects of all that a government administrator could do.

If the government should assume control of operation, it might limit or perhaps even prevent the impairment of official morale by adopting one or the other of two alternatives. It might appoint as the government railroad administrator an eminent railway executive whose ability and experience would inspire the confidence of railway men. Or it might appoint a railway administrator who was not a railway man, but with the understanding that, while he would exercise the authority of the government in so far as might be necessary, he would leave the actual operation of the railroads in the hands of the existing organizations. If the government

should appoint as the railway administrator a man without great experience and demonstrated ability in railroad affairs, and he should attempt to supplant the existing organization in the management of the railways, there would result a serious demoralization.

Unfortunately, our experience with government regulation has not been such as to encourage the hope that a government administrator, unless he were an experienced railway officer, would show the needed self-restraint and good judgment. The present railroad situation is due ten times as much to faults of railroad regulation as to faults of railroad management; and the effects which have been produced by the wrong kind of railroad regulation should serve as a warning which would prevent the adoption of government railroad management of the same misguided and destructive kind.

* * *

However, no matter how unwise railway executives and other railway officers may think that the adoption of government management may be at this time, no matter how unwise they may think the kind of government management adopted is, their duty will be clear. The country is involved in the greatest war ever known. Its future is at stake, and the outcome of the war will depend largely upon how railway executives and railway officers generally continue to do their work. The responsibility and burden of carrying on the war so far as this country is concerned rest chiefly upon one man. President Wilson, in carrying this responsibility and burden, ought to have, and if he is to bear them successfully, must have, the loyal and energetic support of every American citizen. He has done his best to settle the question of railroad management in that way which will most effectively promote the interests of the country. Once he has decided the matter, "Ours not to reason why, ours but to do and die," should be the motto of all railway men.

It was all right before the United States entered the war for people to discuss whether it ought to enter the war. Once it had entered, the first duty of every citizen became that of helping to make its participation in the war a success. So it is all right to discuss the desirability of government operation until it has been adopted. Once it is adopted, however, it will become immediately the first duty of every railway man to do all that is possible to make government operation a success. Nine railway men out of ten believe that the adoption of government operation is unnecessary and a mistake. But it is as much the duty of citizens to help prevent mistakes on the part of the government from having bad effects, as to help prevent the mistakes from being made. The one great object of all at present should be to help win the war; and whether the railways are under private management or government management the one way in which railway men can contribute most toward helping win the war is by contributing all they can toward efficient railroad operation.

FEDERAL LOCOMOTIVE INSPECTOR'S REPORT

THE report of the chief inspector of locomotive boilers to the Interstate Commerce Commission reflects to some extent the condition of the power on the railways in this country. While the percentage of locomotives found defective has increased from 47 per cent in 1916 to 54.5 per cent in 1917, the power throughout the country is believed to be in as good condition as it was at the end of the last fiscal year. The increase in number of defective locomotives shown is largely due to the fact that many roads have placed in service a considerable number of old locomotives which, under ordinary conditions, would have been scrapped and replaced, and they have done this without paying sufficient attention to their condition. The number of classified defects relating to the boiler and its appurtenances is found to have increased over last year a much greater amount than

the defects to the other parts of the locomotive and tender. This also is due primarily to the fact that old locomotives have been placed in service without proper inspection.

A careful examination of the detailed report of defective locomotives found on the individual roads shows that many roads have materially improved the condition of their power over last year, while some have not as good a record as last year. This is evidence that, as the chief inspector says in his report, the power can be properly maintained even under the present exacting operating conditions. He calls attention to the necessity for careful supervision of repairs made to locomotives, and this cannot be emphasized too strongly, for it is practically the only way by which a road may be sure of its power. An engine failure under the present traffic conditions is far more costly than under ordinary conditions, and it is far better to hold a train for a good locomotive than to send it out with one that is liable to fail and cause delays to many other trains. The running repairs must be carefully made and all repairs should be thoroughly inspected to see that they have been made properly.

The number of locomotives inspected this year was less than last year, owing to the fact that the inspectors in this department have at times been used on Interstate Commerce Commission business other than locomotive inspection. An abstract of the chief inspector's report to the Commission is published elsewhere in this issue.

BUY IN HASTE AND REPENT IN LEISURE

WITH a condition confronting the railroads under which performance is of much greater importance than economy, at a time when there is an extreme shortage of labor, great impetus has been given to the demand for labor-saving equipment of all kinds. Under normal conditions machinery designed to save man power is installed only after investigation clearly demonstrates the economy of the installation, but at present the prime condition imposed is that the equipment will bring about an increased production per man. Under such circumstances it is to be expected that the lack of careful study of the possibilities of such equipment which has retarded its application during normal times is now almost sure to result in its unwise and therefore disastrous use in certain cases unless preventive measures are taken before the damage has been done.

Take the case of the freight house truck. The relative merits of the two-wheel and the four-wheel truck commonly used in handling freight have been discussed so frequently that further mention seems almost superfluous. The advantages of the four-wheel truck in saving man power and reducing freight house costs under the usual conditions, whether used with tractors or without them, have been demonstrated repeatedly where care has been taken to secure equipment suited to the local situation and to modify the operating methods to meet the limitations of the new equipment. Notwithstanding this, trials with the four-wheel truck in certain cases have resulted in their subsequent abandonment for one of two reasons; either the situation was one to which the trucks were not suited or their trial use was not conducted intelligently.

Personnel is important. The right man should direct an investigation of this kind and in the right way. Before the work is taken up, this man should be fully convinced of the merits of the plan himself, and unless he is entirely in sympathy with it he cannot or will not overcome the obstacles to success. Selection of the equipment is also important; a duplication of the trucks used successfully in some other house will not necessarily be the proper solution in the case in hand. Other features that endanger or may prevent the success of the new installation include failure to redistribute the labor to secure the best results under the new conditions. Success may demand an entire change in the method of

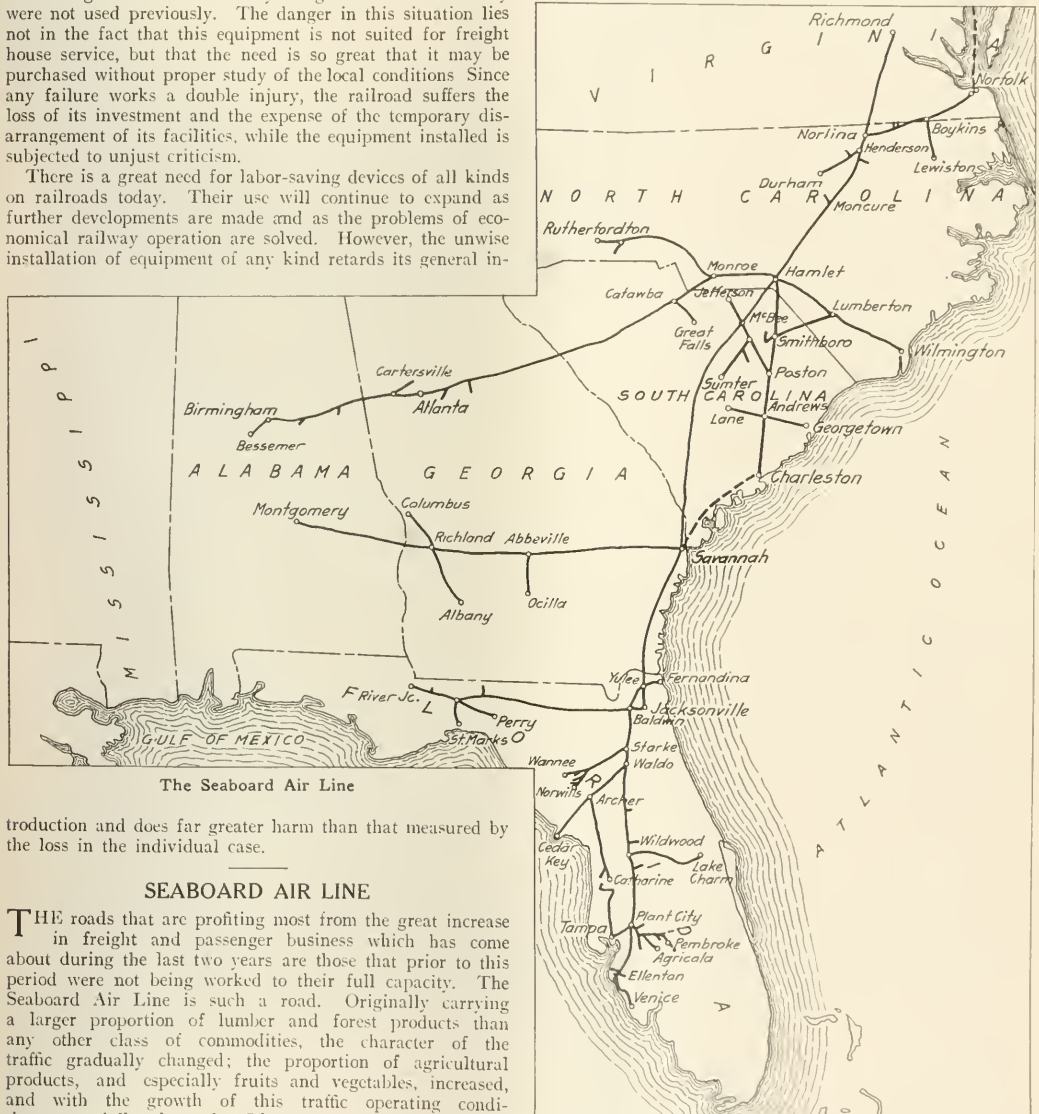
checking or routing the freight through the house. In more than one case failure has resulted from the reluctance of some individual to depart from long-established standards. These and other difficulties, usually surmountable if properly studied, have, in certain instances, prevented the installation of new equipment in the past.

Under press of the prevailing need for reducing the congestion in terminals, the four-wheel truck and the tractor are now being introduced in many freight houses where they were not used previously. The danger in this situation lies not in the fact that this equipment is not suited for freight house service, but that the need is so great that it may be purchased without proper study of the local conditions. Since any failure works a double injury, the railroad suffers the loss of its investment and the expense of the temporary disarrangement of its facilities, while the equipment installed is subjected to unjust criticism.

There is a great need for labor-saving devices of all kinds on railroads today. Their use will continue to expand as further developments are made and as the problems of economical railway operation are solved. However, the unwise installation of equipment of any kind retards its general in-

In the calendar year 1915 the total tonnage of freight carried by the Seaboard was 8,920,000 and the freight density (ton-miles per mile of road) 434,000. In the calendar year 1916 the total tonnage carried was 10,496,000 and the density 543,000.

Of the total tonnage carried in 1916 over 35 per cent was manufactures, comparing with less than 34 per cent manufactures in 1915. In 1916 the products of agriculture were



The Seaboard Air Line

roduction and does far greater harm than that measured by the loss in the individual case.

SEABOARD AIR LINE

THE roads that are profiting most from the great increase in freight and passenger business which has come about during the last two years are those that prior to this period were not being worked to their full capacity. The Seaboard Air Line is such a road. Originally carrying a larger proportion of lumber and forest products than any other class of commodities, the character of the traffic gradually changed; the proportion of agricultural products, and especially fruits and vegetables, increased, and with the growth of this traffic operating conditions materially changed. The plant, however, with the exception of equipment, was at no time being worked to anywhere near capacity. Within the last few years a further change has taken place in the character of the traffic handled by the Seaboard. The proportion of manufactures carried has been increasing and a larger traffic in heavy loading commodities, such as stone, sand, etc., has developed.

12.89 per cent of the total tonnage, and 1915, 16.72 per cent. Products of mines furnished 24.65 per cent of the total tonnage in 1916 and 23.26 per cent in 1915. With the change in character of traffic in recent years there has taken place a change in operating methods. Competition and the character of traffic had led to the use of high speed, compara-

tively light locomotives for freight service, with fast schedules for freight trains and, of course, high ton-mile costs. Within the last few years, however, heavier locomotives have been put into freight service, the average trainload greatly increased, and what are generally understood to be modern scientific methods of railroading have been applied. In 1911 the average freight trainload of all freight, including company, was 251 tons; in 1916 it was 400 tons. There was a big increase in 1916 over 1915, the average trainload of all freight in 1915 being 337 tons.

The management has replaced Pacific type locomotives in freight service with Mikados and has now ordered 26 locomotives divided between Mallets and Santa Fe type. Difficult as it has been to get deliveries of equipment, the Seaboard expects to receive these heavy locomotives within the next few months.

In 1916 the Seaboard earned \$26,184,000, an increase of \$3,544,000 over 1915. Expenses and taxes amounted to \$18,743,000, an increase of \$2,137,000, leaving an increase of \$1,402,000 in operating income, the total operating income in 1916 being \$7,429,000. A part of this increased income was offset by a debit of \$144,000 for hire of equipment as against a slight credit in 1915 on this account and an increase of \$290,000 in interest charges. The amount available for interest on the income bonds was \$2,862,000 in 1916 and \$1,805,000 in 1915. The full 5 per cent on these bonds calls for \$1,250,000, which amount was paid in both years, leaving a surplus in 1916 of \$1,612,000 as against \$555,000 in 1915.

In 1916 the Seaboard had not yet begun to feel the full force of the increase in operating costs which has since hit all railroads so hard. In the nine months of the present calendar year total operating revenues amounted to \$21,940,000, and since the winter months are the busiest ones for the Seaboard, this will mean between one and two million dollars increase in gross over 1916 for the year. Total operating expenses for the nine months were \$15,579,000. The increase in expenses has been large but had not up to the end of September entirely offset the increase in gross, operating income being \$5,361,000 for the nine months ended September 30, an increase over the corresponding nine months of the previous year of \$242,000.

Besides the economies that may be expected to follow the placing in service of Mallet and Santa Fe locomotives, the opening of the new line which the Seaboard has built from Charleston, S. C., along the edge of the sea coast to Savannah, Ga., will permit of very considerable economies in operation. A glance at the map will show that this new line, which it is expected will be completed during the present calendar year, will give the Seaboard two lines from Hamlet, N. C., to Savannah, Ga. Grade revision work has been done on the line from Hamlet to Charleston so that the new through line to Savannah will have a maximum 0.5 per cent grade and a maximum curvature of 3 deg. This maximum grade and curvature hold good for the entire line from Hamlet, via Charleston, to Jacksonville, Fla. The new line will permit of an increase in trainloading between Hamlet and Savannah of over 127 per cent.

Considerable other grade revision work is being done, and that between Raleigh, N. C., and Sanford will permit of considerable economies. When the work now in progress is completed on the line from Sanford, N. C., to Hamlet, two pusher grades will have been eliminated and a maximum .5 per cent northbound and .8 per cent southbound grade will have been established. In 1916 a total of \$2,027,000 was spent for additions, betterments and extensions to road and a net of \$172,000 to additions to equipment. At the end of the calendar year the Seaboard had \$2,385,000 cash, exclusive of special deposits with fiscal agencies and trustees, and no loans and bills payable except a nominal amount—

\$44,000—coming under this classification. The Seaboard is carrying on its balance sheet \$5,234,000 discount on funded debt, comparing with \$10,878,000 carried on the balance sheet as of June 30, 1916. During the six months June 30 to December 31, \$5,273,000 discount on bonds sold in previous years was charged off through profit and loss, leaving a surplus to profit and loss at the end of the calendar year of \$5,796,000, comparing with a profit and loss surplus of \$8,057,000 as of June 30, 1916.

The Seaboard depends entirely on colored labor for maintenance of way gangs, and the movement of negroes into the North has caused a shortage of section labor comparable to the shortage due to the lack of newly landed immigrants and the demand for industrial labor in the East, and the demand for farm and industrial labor in the West. During 1916 \$3,188,000 was spent for maintenance of way, an increase of \$557,000 over the previous year. Maintenance of equipment cost \$3,910,000, an increase of \$635,000 over the previous year. The following table shows the percentage of each class of expenditures to total operating revenues:

	1916	1915
Maintenance of way.....	12.17	11.62
Maintenance of equipment.....	14.93	14.46
Traffic expenses.....	3.47	3.47
Transportation expenses.....	33.07	35.02
General expenses.....	2.90	3.32
Total, including miscellaneous.....	66.96	68.44

The following table shows the principal figures for operation in the calendar year 1916 compared with the calendar year 1915:

	1916	1915
Average mileage operated.....	3,452	3,409
Freight revenue.....	\$18,211,895	\$15,434,241
Passenger revenue.....	5,348,979	4,781,523
Total operating revenues.....	26,184,487	22,640,876
Maintenance of way and structures.....	3,187,544	2,630,459
Maintenance of equipment.....	3,909,974	3,275,144
Traffic expenses.....	907,086	785,581
Transportation expenses.....	8,660,088	7,928,829
General expenses.....	758,373	750,915
Total operating expenses.....	17,531,907	15,494,595
Taxes.....	1,210,691	1,111,381
Operating income.....	7,428,999	6,026,677
Gross income.....	7,889,431	6,429,784
Net income.....	2,862,011	1,804,802
Interest on adjustment (income) bonds.....	1,250,000	1,250,000
Surplus.....	1,612,011	554,802

NEW BOOKS

Street Railway Fares. By Dugald D. Jackson, professor of electrical engineering and David J. McGrath, research assistant in electrical engineering at the Massachusetts Institute of Technology. 155 pages, 58 illustrations, 6½ in. by 9½ in., bound in cloth. Published by McGraw-Hill Book Company, Inc., 239 West 39th street, New York.

The contents of this book comprise data collected and conclusions reached in a research on electric railway traffic and fares, which research has been performed at the Massachusetts Institute of Technology. The data on street railway traffic and fares were broadly investigated for many years back, and were carried up to the present. The subdivisions of the main problem taken up comprise the major factors of street railway traffic, which influence the cost of carrying the average passengers and the manner in which these factors affect the practicability of making long hauls for five cents in ordinary street railway service. The data points strongly to certain limitations in regard to fares and hauls, which are intimately associated with the density of traffic, measured either in revenue passengers carried per car-mile run or passengers carried per year per mile of main track. The more important subdivisions of the subject dealt with have been treated in separate chapters, and it is believed that this subdivision of the chapters will make the book more valuable to students of street railway problems.

Letters to the Editor

MOTOR FREIGHT TRUCKS ON HIGHWAYS

AMARILLO, TEXAS.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Referring to your editorial on "Highways Helpful to Railways," November 30, page 967.

In the Southwest it is questionable if motor freight trucks are helpful for following reasons: Many improved highways have been built parallel to railways to serve the larger towns. The work is financed by bonds, ultimately paid for by taxing property in the district, largely paid for by the farmers and railways. The carriers for hire on these good roads do not participate in either cost of construction or maintenance; in fact, very often no provision is made for maintenance.

When good roads are built, traffic is concentrated on them and they are soon cut up and become as bad as before and additional taxes are needed for maintenance from property owners. Jitney passenger lines and motor truck freight lines have not paid any taxes in many cases, though the last session of the Texas legislature passed a law taxing them about one million dollars. This is not enough, because taxes on other property have been increased about 50 per cent. The expense of finishing most highways in this district with a surface that will bear heavy trucking is prohibitive.

However, motor trucks can help railways by short hauls to relieve cars for long hauls, especially in intra-city switching movements; the main point to consider is that all motor carriers for hire should be properly taxed to bear their share of maintenance of highways by a special tax.

AVERY TURNER.

ELIMINATE UNNECESSARY VALUATION DETAILS

RICHMOND, VA.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

In the *Railway Age Gazette* of November 30 I read with much interest the editorial on "The Valuation Department and Exemptions." From my own organization 14 men have entered military service. With one exception, all are from my engineering force, and all are fine fellows—men whom I wanted to keep. Only two were drafted. One is now with one of our engineering regiments somewhere in France. The majority of the rest are holding commissions in the infantry and artillery. They should all be attached to our engineering forces. This depletion of my force leaves me short-handed with vacancies that are hard to fill, especially engineers and draftsmen.

The editorial referred to makes the depletion of valuation forces a plea for the discontinuance of the work of Federal valuation, and in that plea there may be reason. But to me there is in addition a strong plea for a revision of the methods now followed in this work, probably necessary under the Valuation Act, so as to get away from a lot of useless, burdensome and costly details that have no relation whatever to the great and sole object in view in this work—the ascertainment of "Value," of "Final Value." It may be that the ascertainment of "Final Value" is solely a judicial procedure. I leave that question to the lawyers.

I might say much on this phase of Valuation work, but it may be best to "let sleeping lions lie," because if I were to start to talk about a revision of this whole matter, I would begin with the very Act itself, an act that has loaded the Interstate Commerce Commission, as well as the carriers,

with a heap of useless, costly work. An Act lacking in constructive statesmanship, burdensome with irrelevancy, and distractingly indefinite.

It may be that the work must go on as it is going on, because of the mandate of the Act. But, while this great work of valuation is important, yet, if it is interfering with the great, paramount duty of our Nation today, then it should be stopped. I leave that question open, although there need be no interference.

I would not plead for the cessation of the work. There are good reasons why it should not stop. But I do plead for common sense in doing the work. Is it too late?

JAMES P. NELSON,
Valuation Engineer.

A QUIBBLE OVER A QUESTION OF DUTY

MADISON, WIS.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

On page 952 of your issue of November 23, 1917, you have published a map which purports to show the rates which each state permits the railroads to charge for passenger fares. A certain area on the map covering eleven states is colored black and these states have been designated "slack-rate states."

Before considering the fundamental fault that inheres in this analysis due to drawing conclusions from insufficient data, we are constrained to pause to consider the taste displayed by the use of this term as employed in this case. The word "slack-rate" has come to have a well defined and opprobrious meaning in the English language. It is a useful expression designed to describe a person or institution derelict or negligent in the discharge of certain duties toward his government or country. Phrase makers who attempt to enlarge the meaning of the term so that it may cover any person, establishment or institution against which they desire to inveigh, do much to rob the term of its usefulness in the particular emergency in which our country is involved. A specific term capable of nice use may become a general and meaningless expression through popular attempt to use it to cover situations to which it was not intended to apply. More particularly is the word robbed of its effectiveness when it can be shown that it was employed through no desire to make use of its descriptive force, but was maliciously used to secure the impeaching effect of the opprobrium it was originally designed to convey.

Though no explanation is given on or in connection with the map as to the basis for the figures indicating fares permitted in each state, the actual facts with respect to the state of Wisconsin, at least, dispute the correctness of the data shown thereon.

Under the laws of Wisconsin a railroad whose gross receipts amount to \$3,500 per mile per annum is not permitted to charge more than two cents per mile for passenger fares. Railroads whose gross earnings are less than \$3,500 per mile per annum may charge higher fares. Schedules of passenger fares on file with the railroad commission of Wisconsin show that many railroads in this state charge three, four and even five cents per mile for passenger fares.

The following list shows the rates of fares charged by certain of these railroads:

Illinois Central	3 cents per mile
Duluth, South Shore & Atlantic	3 cents per mile
Green Bay & Western	3 cents per mile
Wisconsin & Michigan	3 cents per mile
Stadley, Merrill & Phillips	3 cents per mile
Wisconsin & Northern	3 cents per mile
La Crosse & Southeastern	3 cents per mile
Fairchild & Northeastern	4 cents per mile
Mineral Point & Northern	5 cents per mile
Hillsboro & Northwestern	5 cents per mile
Other small railroads	5 cents per mile

It is true that the railroads which operate a large proportion of the mileage in the state are affected directly or indirectly by the so-called two-cent-fare law, but the above

figures show that any statement that all passenger fares are on a two-cent per mile basis in Wisconsin is erroneous.

C. M. LARSON.
Engineer, Railroad Commission of Wisconsin.

FRICION DRAFT GEAR IN SERVICE

CHICAGO, Ill.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I have read with interest the article on friction draft gear by Professor Louis E. Endsley, which appeared in the *Railway Age Gazette* of November 16. The author states that there are three things that draft gears may do.

1—Produce slack in starting trains. 2—Control slack in the movement of trains. 3—Reduce the impact force in the switching of cars.

The author dwells on the third item extensively, considering principally the results shown by testing machines. This is very interesting and instructive, but I desire to present a few observations dealing with the first two items.

In determining what is the best draft gear in train service we should not be governed entirely by laboratory tests, as they do not represent service conditions. With the individual gear a high resistance with a low recoil shows the best results. In train service a high resistance and a high recoil are absolutely necessary to prevent slack action. The stored energy from the draft gear should be sufficient to release the gears throughout the train. Slack action caused by the non-release of the draft gear must be eliminated to avoid shocks in train service. In the report of a committee of the Air Brake Association appointed to investigate slack action in long passenger trains the following statement is made:

"From 1½ to 8 in. of slack between cars has been noted in handling trains, the average being about 2 in. per draft gear. It is evident from the investigation that draft gear generally is inadequate for present heavy passenger service. Draft gear failures occur universally in starting and stopping trains."

An investigation of freight trains should be made along similar lines. It is my opinion that friction draft gear with its increased travel and low recoil increases slack action because it has not sufficient stored energy to return to normal position after being closed by sudden jerks or thrusts or after creeping under the tractive force of the locomotive. After the gears have been in service for some time the parts wear and lose their resistance. To satisfy yourself of the fact go out in any yard when tonnage trains are pulling out and you will find 90 per cent of the draft gears stretched to the limit of their travel by locomotives with tractive efforts of less than 70,000 lb. If we were to increase the draft gear travel to 4 in. we would have more slack than ever before. The increased movement of 2 in. over the spring gear would add 8 in. between each two cars, half of which would be slack.

The conclusions which I have reached after numerous tests and observations of draft gears are as follows: No draft gear, spring or friction, has sufficient stored energy when closed to return to its normal position in a tonnage train, when the engine is working at its full capacity; any draft gear that remains closed from the tractive effort of an ordinary locomotive is useless as far as train operation is concerned. A 4-in. travel is no better than a 2-in. travel if the spring remains closed. A friction draft gear with a long travel and a low recoil does not have time to return to normal position before a reaction takes place. Such gears increase slack and shocks, as the distance between the closed position and the normal position of the gear in train service is lost motion or slack. Due to the factors of time and travel the reverse action is different in train service from that shown in the drop testing machine. In the testing machine the gear has but one action, namely, closing when force is applied, while in train service there is a double action. Any draft

gear, spring or friction, should have at least 100,000 lb. stored energy when closed, in order to release half way under the strain of an engine with a tractive effort of 50,000 lb. This would reduce slack action.

I agree with the author that cars should not be thrown together in yard service at speed exceeding four miles an hour. Switching service is, however, a secondary issue, since it can be controlled. The operation of cars in road service must be made as nearly fool-proof as possible. Under present conditions it is not a question of having sufficient coupler travel to start trains, but it is a question of having an engineer who can start without shock or breaking the train in two, due to excessive travel. The whole matter resolves itself into two questions, namely, Shall we increase the travel and also the shock? or Shall we increase the recoil, thus reducing the slack that produces the shock? The present Master Car Builders' standards of coupler travel are sufficient and should not be changed or departed from.

H. C. PRIEBE.

WHY NOT REGULATE THE COST OF PRODUCTION

RIVERSIDE, Cal.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Being very much concerned about the labor situation in general, and filled with a desire to give my views some publicity, I am writing you and while I am not anxious that you publish my letter, I would like to see some expression given covering the ideas, as I feel there is a public need of fairness in regulation.

While I understand from the press reports that the federal government is beginning to fix maximum prices on commodities, wheat and coal in particular, nothing appears to have been done towards regulating the maximum cost of production. Assuming that the maximum prices that may be asked for wheat and coal are based on the present cost of production, what is going to be the result when the farmer or the miner is obliged to increase the wages of the employees? How can these producers be expected to continue production at a loss? In our business, the maximum selling price of transportation is substantially fixed while the price of labor is not fixed and the result is that we are forced to lose money on many properties. The losses of a railroad are widely distributed and, the corporation being large, the burden can be borne for some time, but what of the farmer and the miner and perhaps others; will they not curtail service under such conditions and, as a result inflict hardship on the country at large?

Since the draft law has become operative whereby the young men of our country are forced into the service of the government at a maximum wage fixed by the government, and in view of the fact that industrial success is necessary in carrying on the war, it seems to me that the government could well provide by statute that the wages effective as of a given date in any line of industry should not be increased without governmental consent during the period of the war, or something to that effect. There is no reason, and I am thinking of the constitution of the United States, why one class of American citizens, of draft age, should have their work and wages fixed by the government, and on the other hand and, at the same time, allow other American citizens to stay at home and dictate what they shall get or even whether they shall work so long, particularly, as their work is in any way of interest to the public at large. In other words, it seems to me that in all fairness maximum pay in industrial lines must be fixed, or an army of industrial workers formed. Surely this government is big enough and strong enough at this time to protect the public interest by preventing extortionate wages being demanded.

W. J. BOHON,
General Manager, River-de, Rialto & Pacific.



"Over-There." All Aboard for "Somewhere-Else in France." Copyright by Underwood & Underwood, N. Y.

Another Day With the Railwaymen in France

The Engineers Continue to Be Headliners in the Day's News. Eleven Suffer Serious Wounds at Cambrai

AS if not to be outdone by the railways at home in the way of getting feature headlines in the public press, the railwaymen abroad are doing their best to make feature news for the cables from overseas.

FIRST LOCOMOTIVE FROM HOME

"It was welcomed with open arms" is the expression the New York Evening Sun's staff correspondent uses in a copyright despatch to tell of the arrival of the first American locomotive in France. Cabling on Monday from his station with the American Army in France, he says:

"Immense American hogback engines, the joy of the Yankee railroadman, are now drawing trains of ammunition, also supplies and wounded soldiers back to the French front.

"The railroad engineers who took over the French strategic railroad during September received their first locomotive from home recently. It was welcomed by them with open arms.

"It was a sort of personal victory for the locomotive. Cheering Americans lined the tracks along which the big machine had a kind of triumphant progress. One engineer, describing the scene, said:

"The greatest thing of all was that bell. I never paid much attention to engine bells at home, but this one sounded like music when that chu-chu came down the track!"

"French locomotives do not use bells, so the American machines must be shorn of that musical adornment, for at the French front the bell is the signal of a gas attack. If French soldiers heard that engine bell they would all don gas masks.

"Our engineers have been under fire again. German artillery is dropping shells all around the barracks of one detachment. No damage has been suffered.

"The Americans have been picking up the shell fragments for souvenirs. Engineers report that they are handling without a hitch more traffic than ever passed over these railroads before."

BELGIUM GIVES PERSHING 600 LOCOMOTIVES

As a mark of its appreciation of what the United States has done for Belgium, says an Associated Press despatch, dated December 8, the Belgian Government has turned over to the American expeditionary force 600 locomotives, all that remains of the Belgian motive power. Gen. Pershing has been authorized to make such disposition of them as he deems advisable.

To a Belgian representative Gen. Pershing expressed the appreciation which, he said, he knew would be felt by the people of the United States, especially as the Belgian government's act would result in a large saving of cargo space on American ships.

Early in the war Belgium had in France about 1,700 locomotives. Since then the government has turned over for the use of the Allies about 1,100 of these. The remaining 600 the Belgian government had retained up to this time as a nucleus for the rehabilitation of the commerce of the prostrated nation after the war.

When it was found that the American expeditionary force could use a considerable supply of motive power on the lines from the base ports to the army zone the Belgian government made haste to offer the use of the locomotives, realizing that to ship as many from the United States as were needed would require a large amount of cargo space which might be used for other supplies.

Many of the locomotives will be speedily put into use and will be operated under the direction of the transportation department.

MORE ABOUT THE BATTLE OF CAMBRAI

How American railway engineers gallantly fought and died with their British comrades in arms on the front before Cambrai was told December 7 in a semi-official statement forwarded by the Associated Press.

"Two and one-half companies of railway engineers," the statement says, "with a strength of eight officers and 365

men, were encamped at Fins on November 30, having completed their work in the neighborhood. At 6:30 four officers and 280 men went to Gouzeaucourt, arriving at 7 and starting to work with Canadian engineers. The entire contingent was under a Canadian major and an American captain. The area was three miles in the rear of the line and none of the troops was armed.

"At 7:15 German barrage fire moved on Gouzeaucourt after heavy shelling to the east. At 7:30 a general retirement was ordered, and it was effected with some difficulty, due to the artillery, machine-gun and airplane fire.

"A number of losses were sustained at this time, and also among the men who, cut off by the German advance, had taken refuge in dugouts. Some of these men who had been cut off succeeded in joining British combatant units and fought with them during the day. Meantime there was active shelling against Fins, and the men there were ordered to scatter in the fields.

"As the men returned to camp they assembled under arms and instructions were asked from British headquarters. At 3 o'clock they were instructed to dig and hold the trenches, and the men moved up and started work shortly afterward.

"At 6 the trenches were finished sufficiently for the entire

fighting line. The recommendation, which is certain to be adopted, was made as a result of the predicament in which the engineers found themselves when they became involved in a German attack on the British front last week. At that time they were forced to take up guns abandoned by dead and wounded soldiers."

THE CASUALTIES

That the railway engineers suffered severely is shown by the list of casualties forwarded to the War Department from General Pershing. The list gives the names of 12 of the engineers severely wounded and two slightly wounded; including one second lieutenant, two sergeants, three corporals and eight privates. The second lieutenant mentioned was Allie L. Cone of Company D of the 11th Engineers, the regiment that was recruited in New York.

ASSOCIATION OF 11TH U. S. ENGINEERS

About 800 relatives and friends attended the meeting of the Association of the 11th U. S. Engineers Sunday afternoon in the Engineering Societies building, New York, President Frederick L. Cranford, a prominent New York public service contractor, presiding. The 11th Engineers is



Officers of the Thirty-Fifth Engineers (Shop Regiment), Now at Camp Grant, Rockford, Ill.

Bottom row: Left to Right, Capt. Chas. H. Fueller; Lieut. Walter Budwell, Lieut. Wm. F. Philbrick, Lieut. Col. G. H. Vincett, Col. A. E. Waldron, Major J. F. Surridge, Lieut. R. E. Trippe, Capt. Jos. W. Moore, Lieut. Wittet (Medical Detachment), Lieut. McDaniels (M.D.), Capt. W. G. Vincett, Sec. Lieut. R. F. Getz, Sec. Lieut. Leo. J. Stein, Capt. W. Woodard, Lieut. W. S. Mack.

Second row: Lieut. Hill (M.D.), Lieut. P. E. Carter, Lieut. Miller (M.D.), Capt. H. C. Huffer, Jr., Regimental Adj., Lieut. L. T. M. Ralston.

Third row: Sec. Lieut. R. G. Stafford, Lieut. David Holderman, Lieut. A. W. Holbrook, Lieut. M. V. Holmes, Lieut. O. S. Dickson, Capt. W. R. Pearson, Sec. Lieut. N. C. Raabe, Sec. Lieut. B. G. Hegel, Lieut. F. W. Haugmann.

Fourth row: Lieut. F. C. McFarland, Sec. Lieut. F. W. Ford, Jr., Lieut. A. F. Ainslie, Lieut. Loring (M.D.), Lieut. R. M. Smith, Capt. John G. Hollman, Lieut. H. L. Dyke, Lieut. Wm. A. Hauth, Sec. Lieut. R. C. Montgomery, Lieut. Smith (M.D.), Lieut. John F. Weiss, Lieut. John S. Wetherill, Lieut. Lee, Chaplain.

Last row: Capt. F. N. Hatch, Sec. Lieut. E. B. Wilkinson, Capt. Wm. E. Abbott, Capt. E. B. Hocker, Lieut. Morris, Sec. Lieut. R. J. Offutt, Capt. W. C. Lindner, Capt. H. P. Wilson, Jr., Lieut. H. M. Fetterolf, Sec. Lieut. H. Darlington, Lieut. K. J. Zinck, Lieut. J. L. Blair, Lieut. W. S. Mussenden.

command and division headquarters directed a withdrawal to camp and that the men be held in readiness to man the trenches. Two small details were sent out to repair a distant break in the new track and to assist in transferring ammunition to another point.

"The list of casualties is relatively small and will be issued tomorrow. It is stated by British officers that the conduct of the regiment was most satisfactory. They praise its coolness under fire, and the ability of the men to work without interruption is regarded as most commendable.

"Engineer organizations in the American Army hereafter, it was recommended today, shall be armed and ready for battle on all occasions when they are anywhere near the

the regiment that was in the midst of the fighting around Cambrai and was mainly recruited in New York. The association consists of the relatives and friends of the 11th Engineers and was formed soon after the regiment sailed for France, with the purpose of acting as a clearing house for information concerning the regiment, providing for the physical comfort and well being of the regiment as far as possible, and giving help and comfort to dependents.

The association reported the sending of Christmas boxes containing tobacco, bouillon cubes, candy and concentrated coffee to all the 1,300 men. The boxes were paid for with voluntary contributions made to the treasurer, R. L. Cox. At the meeting \$700 more was added to the fund.

The most interesting feature of the meeting was the reading of about 20 letters from members of the regiment and the contribution of late bits of news from the front. Anxiety as to the casualties in the recent engagement with the Germans, for which members of the regiment were praised by a British General, made a background of intense feeling.

Plans were made to print and distribute among the members of the association a composite letter, containing all items of general interest received in letters from the front. Members were urged to forward their letters or excerpts from them promptly to the committee.

ENGINEER CAPTAIN CONFIRMS ATROCITIES

One of the most striking letters read at the meeting was from a captain of the regiment:

"I never before believed the stories we got in America of the boche outrages. I have to believe them now, and they are many times worse than the stories that I heard at home," said the letter.

"Canadian and Scottish battalions take no prisoners," the captain said. "They give and ask no quarter. The reason is that the boches have several times crucified Cana-



The Colors of the 35th Engineers, Now in Camp at Rockford, Ill., Were the Gift of American Car Construction Companies

dian and Scottish prisoners and held them above the trenches in view of the battalion. In one such case a Canadian battalion went right over the top to the boche trenches without orders. Very few of them returned.

"The thing that makes our blood boil is the absolutely unnecessary and wanton destruction wrought by the retiring Hun. His usual wonderful, systematic methods have been applied to this destruction. Whole towns that have hardly been touched by shell fire have been destroyed by dynamiting.

"So much of it has absolutely no military value. Isolated homes, beautiful chateaux, garden walls, little summer houses are all blown up. Shade trees, flower trees are cut down or the bark cut so the trees will die. Cemeteries have been ransacked.

"I have seen three cemeteries that are awful sights, one body dragged half out of the casket, caskets broken open and the bones from several dumped into one. Evidently the boche was looking for jewelry, or was simply malicious or both.

"Those things could not be done without the knowledge and permission of the officers; and the thing is so complete

that it looks as though it was all a part of an official systematic programme. I never did believe the stories we got in America of the boche outrages. I have to believe them now; and they are many times worse than the stories we heard at home."

Then follows a story of the crucifixion of prisoners and the violation of a convent.

"I cannot understand what the mental operations or processes of the Hun can be," the letter ends. "It must be the wrathful spite of a disappointed, degenerate mind."

A letter from a younger engineer, written in a lighter vein, speaks of the employment of women. "Everything here seems to be run by the women. The trolley car I rode on had women for motorman and conductor. The former was very robust and quite pretty, with considerable rouge on her face. I rode to the end of the line, and when she came through the car she chucked me under the chin and said I was 'a fine American.' It is a pretty nice country where the motorman loves you, isn't it?"

That two American engineers acting as stretcher bearers were shot in cold blood by German soldiers in the recent attack on the British lines at Cambrai is the report received at American army headquarters in France by a New York surgeon attached to the force of American railway engineers who fought at Cambrai, says the New York Sun's staff correspondent in a copyrighted despatch to his paper dated Tuesday.

"These two men," the despatch continues, "were unarmed, like the rest of their comrades, when the attack came, and for some time they hid in a dugout. When they came out they found the trenches deserted. They did not know the Germans had passed and started toward the rear. On their way they found a wounded British officer on the ground and making a stretcher out of a blanket started to carry him into a ruined village which they supposed was still occupied by the British.

"Suddenly some Germans appeared and despite the fact that the Americans had no weapons and were engaged in a work of mercy they shot and killed both of the stretcher bearers without giving them a chance to resist. They then dragged the wounded officer to their headquarters, where he was questioned in an endeavor to gain information as to the British strength.

"The British officer refused absolutely to answer questions, and so was dragged out and left on the ground again, though weak from loss of blood. Soon afterward there was a furious counter attack by a handful of men from the Royal Irish Rifles, who recaptured the ruined village and saved the officer.

"Another incident in the same battle drove home the truth of the British stories in regard to the German methods of fighting. This concerned an engineer sergeant, a big Irishman from New York, whose wit and good nature had been the life of the company. The Irish sergeant was badly wounded in the Cambrai fighting and was being taken to the rear in an ambulance when a German Taube, flying low, poured the contents of a machine gun into the ambulance. At the time the vehicle was plainly marked by the Red Cross and must have been recognized by the German airmen. One of the bullets slashed the sergeant's face.

"As more details become known as to how the Americans acted in the Cambrai surprise attack the greater becomes the pride of their comrades in their achievements. One engineer, unable to get hold of a rifle, went at the Germans hand to hand, armed only with his spade. Swinging this implement with which just before then he had been digging he felled two Germans before he himself was dropped.

"He was badly wounded in the head, but insisted on walking back to the dressing station. Asked by an officer how he felt, the wounded engineer replied: 'Oh, I'm all right except those damned shoes the quartermaster served out to me are so tight I can hardly walk.'"

EASTERN OPERATING COMMITTEE MAKES PROGRESS

Reports to the Railroads' War Board indicate that the General Operating Committee of the Eastern Railroads has already been able to effect results in relieving the congestion on the eastern lines which has been especially noticeable in the Pittsburgh district. On December 4 the committee adopted a resolution stating that whereas the situation through the Pittsburgh gateway is easing up on certain routes, the chairmen of the sub-committees at Chicago and St. Louis were authorized to issue permits for movement through the Pittsburgh gateway of such cars as the operating officers of the interested lines will approve, sending to the committee at Pittsburgh copies of such permits.

The first action of the committee, which established its office at Pittsburgh on November 28, was outlined in last week's issue. After making a preliminary study of the situation and issuing a few orders deemed most essential to effect an immediate improvement, the committee appointed sub-committees at the principal cities in its territory to report to the General Operating Committee. The instructions of the sub-committees are:

(a) To secure information covering the exact transportation situation throughout their respective territories; to agree upon and put into effect, measures for immediate relief of congested points, keeping the General Operating Committee constantly advised, and to pay particular attention to government freight, fuel, foodstuffs, and raw materials for blast furnaces.

(b) To agree upon and make recommendations to the General Operating Committee when the situation is of such magnitude that it cannot be reached by local treatment.

Various members of the General Operating Committee were assigned to the sub-committees to have special supervision over their work. The location of the various sub-committees and their chairmen are as follows:

Boston: C. L. Bardo, assistant to president, New York, New Haven & Hartford; New York: W. J. Frupp, general manager, New York Central; Philadelphia: R. L. O'Donnell, assistant general manager, Pennsylvania Railroad; Norfolk, Va.: A. C. Needles, general manager, Norfolk & Western; Cumberland, Md.: S. Ennes, general manager, Western Maryland; Pittsburgh: D. F. Crawford, general manager, Pennsylvania Lines West of Pittsburgh; Buffalo, N. Y.: D. W. Dinan, general superintendent, New York Central; Cleveland, O.: A. S. Ingalls, general manager, Lake Erie & Pittsburgh; Detroit, Mich.: E. D. Bronner, vice-president and general manager, Michigan Central; Chicago, Ill.: A. M. Schoyer, vice-president, Pennsylvania Lines West of Pittsburgh; Columbus, O.: I. W. Geer, general superintendent, Pennsylvania Lines, Southwest System; Cincinnati, O.: W. J. Jenks, general superintendent, Norfolk & Western; Indianapolis, Ind.: J. W. Coney, superintendent, Pennsylvania Lines, Southwest System; St. Louis, Mo.: T. B. Hamilton, vice-president, Pennsylvania Lines, St. Louis System.

Sub-committee chairmen were also instructed to make a report by wire at 12 o'clock noon daily to the General Operating Committee of the traffic conditions in their assigned territory and that this be made an imperative order of business. The chairman of the Pittsburgh sub-committee was instructed to meet with the General Operating Committee at the same time and report especially upon Pittsburgh terminal territory conditions.

One of the first subjects taken up by the General Operating Committee was consideration of the question of an open top car pool for the purpose of reducing switching and empty car mileage, with especial regard to certain situations where special types of equipment are essential to coke supply for blast furnaces. The committee adopted a resolu-

tion favoring an open top coal car pool on lines in Official Classification territory with the Norfolk & Western, Chesapeake & Ohio and Virginian railways included, and that flat, low-side, flat bottom gondola and coke cars should be excluded. It was also resolved that in determining the proportion which each line has contributed to the pool and which is the basis upon which distribution of available cars will be made, the tonnage capacity of the cars shall be considered and that cars of private ownership be included in order to realize the full benefit of the coal car pool.

On December 5, the coal car pool question was further considered and a resolution adopted stating that about 80 per cent of the coal mined in the United States originates on the roads represented by the committee and that an enormous amount of shifting can be eliminated and transportation efficiency increased by pooling coal-carrying cars and using them interchangeably. The committee, therefore, created, effective at once, a pool of all coal-carrying cars upon the roads represented by it, with F. G. Minnick, superintendent of freight transportation of the Pittsburgh & Lake Erie, as manager, with office at Pittsburgh. He was instructed to prepare and submit rules for the operation of such a pool which will insure distribution of pooled equipment in accordance with orders of the government as to priority of transportation and supply the current needs of shippers in accordance with existing regulations of the Interstate Commerce Commission, as well as preserving equities as between car owners.

The Railroads' War Board was requested to secure immediate authority from the proper government representative to pool those coal cars of private owners which are at home on the lines of the railroads represented and that a rate of compensation therefor be established. The Commission on Car Service and E. H. De Groot, Jr., chief of the Bureau of Car Service of the Interstate Commerce Commission, were requested to assist Mr. Minnick in the preparation of suitable rules and regulations to govern the pool.

When information reached the committee that a large number of loaded cars were detained at junction points short of destination awaiting revenue way bills, it requested the roads to move cars being held and make such arrangements as may be necessary to comply thereafter with Order No. 5 of the Commission on Car Service.

On December 5, in order to relieve terminal railroad congestion, as well as to release freight cars for the longer haul east, the interested lines were ordered to place embargoes within the ports of Boston, New York, Philadelphia, Baltimore and Newport News, effective on December 10 against all less than carload intracity freight and against any intracity reconsigning privilege after an incoming freight car has been placed in accordance with original billing instructions, and effective on December 24 against all carload intracity freight.

The committee has also urged all lines to act promptly on the suggestion in bulletin 42 of the Railroads' War Board toward the general adoption of interline billing for the purpose of decreasing detention to traffic and equipment. The Master Car Builders' Association has been called upon to formulate a modification of its present rules that will enable car repairs to be made immediately without sending for material from car owners, so far as is consistent with safety, and to take immediate action through its appropriate committee to make effective this modification as affecting the interchange of equipment in these two territories.

TRAFFIC AT SAULT STE. MARIE CANAL IN OCTOBER.—The vessels which passed through the canals at Sault Ste. Marie, Michigan and Ontario, during the month of October numbered 3,147. They carried eastbound freight amounting to 9,522,244 tons and westbound, 3,123,822 tons, making the total freight carried 12,646,066 tons.

Government Operation of Railways Imminent

President Wilson Expected to Announce Shortly Plan
for Taking Over Railroads for Period of the War

GOVERNMENT control of railroad operations for the duration of the war, probably under the direction of a government railroad administrator with a guaranty of earnings, is understood to be the policy decided upon by President Wilson as a result of his consideration of the recommendation made by the Interstate Commerce Commission in its special report to Congress last week. The President already has the authority of law to take possession of the railroads as a war measure but he is expected to go before Congress shortly with a special message recommending more specific legislation as to the terms of the plan.

Railroad executives from all sections of the country are in Washington conferring with the Railroads' War Board on the expected developments, and the members of the War Board discussed the proposal at a conference with the President on Wednesday afternoon. The question whether the railroads should continue to be controlled by their own managements or whether they should be taken over and operated by the government has been carefully considered by the President for several days but it has come to be regarded as a foregone conclusion that the latter plan will be adopted and that a government railroad administrator will be appointed, the security holders of the roads being guaranteed an adequate return, based on the pre-war earnings, in accordance with some plan patterned after that adopted in Great Britain.

In a last effort to show that government operation would be unnecessary the Railroads' War Board, at a conference on Monday with Chairman Newlands of the Senate Committee on Interstate Commerce, laid before him a plan by which they declared they would be able to furnish all the transportation which the existing plant can produce under any form of management. It is understood, however, that the President, while opposed to the idea of government ownership, feels that government authority is essential to the complete unification of the country's transportation system which the Interstate Commerce Commission declared "indispensable to their fullest utilization for the national defense and welfare."

The railroads pointed out that their principal difficulty is an operating problem and that with active government co-operation, an increase in rates for the eastern lines, and some assistance from the government to enable them to secure capital on their own credit, the unification of the railways now being carried out by the Railroads' War Board could be further perfected sufficiently to enable them to cope with the situation.

This plan, which was the result of a general conference of railroad executives in New York on Sunday, was submitted to Senator Newlands in the form of a letter from Fairfax Harrison which the Senator later placed before the President at a conference in which the alternative recommendations of the Interstate Commerce Commission were fully discussed. The Senator also conferred with the legislative committee of the Interstate Commerce Commission. After his conference with the President it was learned that the President intended to address Congress very shortly and it was understood he had imparted to Senator Newlands his intention of taking over the operation of the railroads.

Mr. Harrison said in the letter:

PROPOSAL OF THE RAILROADS' WAR BOARD

"The American railroad system has not broken down. On the contrary, it has, in recent months, handled 50 per cent more business than in 1915 without material enlargement of plant.

"Some misconception seems to exist as to the immediate

requirements of the railroads in their present situation. Their operating troubles are a volume of traffic greater than the capacity of the plant in certain limited territories, aggravated by excessive use of preference orders, and their now serious malady of 'dilution' of labor, which is general throughout the country and common to all industry. Nevertheless, the railroads under present management are prepared to furnish all the transportation which the existing plant can produce under any form of management.

WHAT THE RAILROADS DO NOT ASK

"1. They do not ask one billion dollars from the government or anybody else at the moment. They could not immediately invest it in plant and equipment if they had it, because of the difficulty in getting materials and labor. That figure represents, in round figures, what ought to be spent in every year for several years to bring the American railroad plant up to capacity to handle efficiently the growing traffic. About \$600,000,000 per annum on the average has been spent for a number of years for road and equipment, which, at present prices, would be equivalent to about one billion dollars for road and equipment.

"2. They do not at this time ask for repeal of the anti-trust and anti-pooling laws as relating to them, for they do not consider such relief immediately necessary to increase unified operations.

"The co-operative use of facilities will be continued in such way as to obtain maximum efficiency.

"The present system of voluntary unification is adequate for this. No interest has declined, or will decline, for selfish or other reasons to respond to the requirements of the present co-operative organization.

WHAT THE RAILROADS DO ASK

"3. The immediate appointment of a traffic officer to represent all important government departments in transportation matters, with whom the railroads can deal, to secure active government co-operation, the prompt and orderly transportation of government traffic, and avoid the excessive use of preference orders, which congest traffic instead of facilitating it.

"4. Most of the railroads need more locomotives immediately and enough new cars to replace those worn out. There are approximately 3,800 locomotives and 33,000 cars still on order undelivered for American railroads. The railroads expect to provide the capital. Priority orders are essential for prompt delivery of such equipment.

"5. Approximately 2,000 locomotives and 150,000 cars, in addition to those now on order, are necessary for early construction to meet the requirements of next year. This is no more than the railroads usually require every year, and at present prices represent a cost of approximately \$500,000,000. While a number of the railroads are able to purchase their quotas of such equipment without aid, it is apparent that because the United States has necessarily occupied the investment market for war loans, as evidenced by the recent request of the Secretary of the Treasury that no new private financing shall be undertaken without conference with him, the railroads cannot next year provide through their usual channels for the capital requirements for the acquisition of equipment and other possible additions to plant. They invoke, therefore, the co-operation and aid of the government through the Treasury Department and the Federal Reserve Board to secure for them, on their own individual credit, the new capital found by the government to be necessary not only

for enlargement of plant but for renewing maturing obligations.

"6. Immediate increases in rates as defined by the Interstate Commerce Commission's special report to meet increasing operating expenses and strengthen credit are necessary in eastern territory, and may become necessary in other territories.

"7. Railroad men drafted to be enrolled and assigned to railroad service until actually needed for military service."

The President has been giving the railroad question a large share of his attention during the past week and while the best information as to his intentions for a time seemed to indicate that his own inclination was against adding direct responsibility for railroad operation to the long list of important tasks which the government is now struggling with, it came to be generally believed by Saturday, even among railway executives in Washington, that he had about come to the conclusion that government operation presents the only feasible solution. It is also understood that one of the most important factors which led to this decision was the assurance that Congress would never stand for a loan to the railroads in an amount which would be sufficient to have any appreciable effect. Numerous members of Congress, with a great show of liberality, have talked about lending the railroads \$100,000,000, but it was apparent that most of them were rather staggered when they were informed of the railroads' estimate that \$1,000,000,000 would be needed. Whether Congress is in favor of government operation of the roads is perhaps a doubtful question but there is no doubt that it would accept a recommendation of the President on this point and a majority of the members of the Cabinet are understood to have advised that the roads be taken over.

PRESIDENT NOW HAS AUTHORITY

The authority of the President to take over the operation of the roads, to which the Interstate Commerce Commission referred in its report, is conferred by a brief clause which was inserted in the army appropriation bill approved August 29, 1916, without attracting general attention because the country was then engrossed with the possibility of a nation wide railroad strike. The clause merely provides that "The President in time of war is empowered, through the Secretary of War, to take possession and assume control of any system or systems of transportation, or any part thereof, and to utilize the same, to the exclusion as far as may be necessary of all other traffic thereon, for the transfer or transportation of troops, war material and equipment, or for such other purposes connected with the emergency as may be necessary or desirable."

This is merely an emergency provision, passed at a time when Congress was taking a few precautionary measures but not seriously considering the possibility of a war. It makes no provision for compensation either of railroad officers and employees or of the security holders, such as is contemplated in the commission's alternative recommendation. While under its authority the President could seize the railroads with a stroke of the pen, it is apparent that he would consider more legislation necessary because, immediately after war was declared, Chairman Adamson of the House Committee, following a conference with the President, introduced a bill in Congress to authorize the President in case of actual or threatened war or any emergency, to take possession in whole or in part of the railroads and prescribe rules and regulations for their operation, drafting into the military service of the United States any or all officers, agents and employees, provided that the operation of the lines should be conducted under the control and supervision of such officers as the President might designate and that whenever, in his opinion, the public safety no longer requires their possession by the United States they should be restored to the owners and the damages suffered or the compensation to which

the companies might be entitled should be determined by the Interstate Commerce Commission. During the time that the United States is in possession, the bill provided: "the officers, agents or employees shall receive for their service such compensation as they were theretofore accustomed to receive for similar services." The bill also contained a provision authorizing the President without taking possession of any of the lines to issue orders either direct or through such persons as he might designate for the purpose, to any officers of the lines or to operate any or all of the lines temporarily.

The President also referred to the probable necessity for additional railroad legislation, "in order to effect the most efficient co-ordination and operation of the railway and other transportation systems," in his message to Congress last Tuesday. Under the present law he could act first and then ask Congress to pass any law necessary to round out the plan.

The commission's report aroused intense interest among members of Congress. Discussion of the idea of a government loan to the railroads had already been started. Senator Newlands announced his advocacy of a large loan. Representative Adamson said he was opposed to the proposed suspension of the pooling law and that he was in favor of loaning money only to the weaker roads. The President held a long conference on the subject on December 6 with Chairman Hall and Commissioners Clark and Meyer of the Interstate Commerce Commission, after which he conferred with Secretary of the Treasury McAdoo.

On the same day the members of the Railroads' War Board and Mr. Willard held a conference with Senator Newlands at which they told him that if any plan of a government loan to the railroads were to be really effective in helping the situation the amount should not be less than \$1,000,000,000. They promised to submit to Senator Newlands a more detailed estimate on Monday before his conference with the President. Contrary to the impression created by many newspaper accounts, the railroads did not ask that the government make them a loan, but emphasized the point that if there is a loan it must be made large enough to be effective, as they feared the psychological effect if they should accept a small loan, such as \$100,000,000, which would not produce perceptible results.

The railroad situation was again discussed at the Cabinet meeting on Friday, after which it was generally reported that, while the President still held an open mind, he had been rather strongly advised by the Cabinet members to exercise his authority to commandeer the roads.

RAILROADS PREPARED TO FURNISH ALL NECESSARY TRANSPORTATION

The attitude of the railroads toward the Interstate Commerce Commission's report was discussed at a meeting which the Railroad's War Board held on Friday afternoon with the Washington correspondents, for the purpose of giving them an opportunity to ask any questions regarding the railroad situation. All of the members were in attendance and some 50 or 40 newspaper men, who asked questions freely and were answered promptly and frankly by Chairman Harrison and the other members. Mr. Harrison also read a general statement of the railroads' position as follows:

"The American railroads under present management are prepared to furnish all the transportation which the existing plant can produce under any form of management.

"They have already made common use of box cars and of many facilities for more intensive operation. The recent action combining facilities of eastern roads and providing for common use of coal cars in that territory is already reducing congestion. The American railroads under the direction of the Railroads' War Board are prepared without reservation to make common use of facilities, power and equipment to accomplish the highest measure of success in the transportation effort of the country.

"They point out, however, that in order to secure complete results, certain action not within their power is essential, viz.:

"(1) Co-operation of important military and industrial agencies of the government to avoid unnecessary congestion upon important lines serving territory of intense industrial activity and occasioned chiefly by extravagant use of preference orders for shipment.

"(2) Reasonable additions to power and cars to replace equipment wearing out and to provide for recent increase in traffic.

"Co-operation with government departments and agencies is already well organized and promises success. Opportunities through priority orders to secure completion and delivery of engines and cars now on order will furnish much immediate relief under the second head.

"The point of the whole matter is that the American railroads have, since our entrance into the war, been operated with the highest efficiency, and have until now transported without substantial complaint the greatest volume of traffic in the history of the country. Responsibility for recent congestions, which it must be remembered are only in a limited but highly important territory, cannot be charged to lack of efficiency or earnest effort to prevent them. From the beginning, the authority of the Railroads' War Board has not been questioned by any railroad, nor has there been any hesitation or avoidable delay in obeying its orders and directions."

URGE APPOINTMENT OF GOVERNMENT TRAFFIC MANAGER

Mr. Harrison pointed out that the General Operating Committee of the eastern railroads had already been able to effect an improvement by diverting freight from the most congested lines. He also said the roads had been advised that the government was about ready to act on the repeated recommendations of the War Board that the government should appoint a traffic executive to decide what shipments were most urgently required and thus avoid congesting the railroads as they have been congested by a multiplicity of preference orders, issued by numerous government authorities and their subordinates, each intent on having shipments in which he was interested handled as rush orders.

The Railroads' War Board has been trying to emphasize in every possible way for the past two or three weeks the necessity for some such action on the part of the government. When the arrangement was made during the summer for the plan under which the various government departments could have their shipments expedited by the use of the blue preference waybill envelopes, according to the plan outlined in the War Board's Bulletin No. 22, it was assumed that they would be used with some discretion. Instructions were issued to the railroads, in case of doubt as to the propriety of the use of the waybill envelope, to accomplish the movement as ordered and then take the matter up for investigation, "inasmuch as these forms are only furnished by responsible officers of the Army, Navy and the Shipping Board, who will undertake to prevent abuse thereof." But it has turned out that the preference orders have been used indiscriminately for all kinds of freight in which the government or the Allies were interested, either without any reference to whether one class of freight was more important than another, or because the man using the order considered that his particular business was more important than any other, with the result that the bulk of the freight moving on some of the eastern roads has been under rush orders.

One of the most conspicuous examples was a "rush" shipment of anchors to a ship yard to be used on ships to be built when the yard is built, using cars and track room in the congested district which are needed for something more important now. The War Board has urged upon every representative of a government department that it has conferred with the necessity of some co-ordinating authority in the gov-

ernment to decide what requirements are most important and to speak for the government to the roads in the same way that the traffic manager of a steel company does. The matter was finally put up to the Secretary of War, with an urgent request for the immediate appointment of an executive to determine the necessary routing and priority of shipments from the standpoint of all departments of the government interested in transportation, and when the members of the War Board were advised that such a plan would be adopted they considered that an important step had been taken toward relieving congestion. In fact the agitation they had conducted against the indiscriminate use of preference orders has already shown an effect.

NEED FOR EQUIPMENT

As to the need for additional equipment, Mr. Harrison said that merely a large number of new cars, without additional power and terminal facilities, would hardly improve the situation; that the roads have nearly enough cars now but ought to have enough new ones for replacements. Out of approximately 100,000 on order nearly 40,000 are still undelivered and 5,364 locomotives on order have not been delivered because the orders of the War Department for the military railroads in France, and of the Russian and French governments, have been given priority. Of 5,140 locomotives under order on June 30, exclusive of those being built in railway shops 1,049 have been delivered. Mr. Harrison said the roads were not criticising this policy of the government but thought the time had almost arrived when the needs of the American roads should be given greater consideration. Even if the government should be able to provide for increased capital for the roads, the eastern lines at least would still need the increase in freight rates they have asked to meet the higher level of operating expenses, Mr. Harrison said in reply to a question, but, because the government has practically monopolized the investment market it is impossible for the railroads to secure new capital in the usual way.

Asked why the plan of pooling the facilities of the eastern lines had not been adopted sooner, Mr. Harrison said that the necessity for it had not appeared until very recently. The principal congestion, he said, was on the Pennsylvania and Baltimore & Ohio and the primary object of the Pittsburgh committee is to relieve the congestion in the Pittsburgh district by diverting traffic to less congested lines. On the Pittsburgh division of the Pennsylvania 85 per cent of the freight recently has been moving under government preference orders. Efforts are also being made to route as much traffic as possible via Gulf and South Atlantic ports. While it was not stated at the meeting, it was learned from other sources that the Pittsburgh committee had already diverted 20,000 carloads of freight from the Pennsylvania to other lines and that 100 locomotives have been ordered from the western lines to the eastern lines, 50 to be delivered through the Chicago gateway and 50 through St. Louis.

Mr. Harrison said that the roads had by no means reached the limit of their possibilities and mentioned the possibility of increasing the movement of essential traffic by reducing passenger service and non-essential freight traffic. Mr. Kruttschnitt also called attention to the fact that in England when heavy troop movements were in progress both passenger and ordinary freight traffic had been suspended, whereas in this country the roads have thus far endeavored to handle both military and commercial traffic at the same time. In reply to questions, Mr. Harrison expressed the opinion that government operation of the railroads would prove less efficient than operation by the roads themselves because the railroad men were doing their best under present conditions and straining every nerve to produce the best results, while if they were told they had failed and asked to work under a government boss they could not work with the same spirit they now possess. He added that the authority of the government was not necessary because the authority of the War Board has

never been questioned by any railroad. The security holders, he said, might be better off under a plan by which the government would guarantee the earnings.

He said the roads had not yet given any detailed consideration to extending the pool of facilities to a pool of traffic or earnings which would run counter to the anti-pooling or anti-trust laws, but had thus far only attempted to handle the operating problem involved, postponing the question of the effect on earnings.

RAILWAY MAIL SERVICE

The reorganization of the Railway Mail Service and the adjustment of rates on the "space" basis is now practically accomplished after a thorough investigation by the department as to unreasonable and uneconomic methods, says the Postmaster General in his annual report to Congress, and although it has not been in operation sufficient time to work at its best, it is already bringing marked improvement to the service notwithstanding the irregularity of train movements, due to the heavy demands on the railroads because of war conditions.

On June 30, 1917, the length of lines on which railway post-office service was in operation was 231,501.39 miles, with annual miles of service of 308,018,777, and the length of lines on which closed pouch service was in operation was 71,268.32 miles, and annual miles of service of 281,499,859.

To date 1,824 railroad mail routes have been stated on the space basis of payment at the maximum rates stipulated in the act, such restatements being effective on November 1, 1916. This restatement embraced practically all routes having full railway post-office and apartment-car service, with storage and closed-pouch service incident thereto. The remainder of the routes, 1,157, were continued on the weight basis.

Although the rate of compensation on the space basis is higher than on the weight basis, the report says, the space basis of pay lends itself to such rational adjustment to the needs of the service that by the close of the fiscal year it was possible to eliminate duplication and other unnecessary

transportation to the extent of approximately \$7,000,000 per annum. Through economy in space the department was enabled to care for a large quantity of "blue-tag" mail, formerly sent by freight, and to handle postal supplies, which made a saving of \$500,000 in freight charges.

The cost of the entire railroad transportation service under the weight basis was at the annual rate of \$62,242,000. The cost of the same service under the space basis was at the annual rate of \$65,492,000, an increase of \$3,250,000 over the weight rate. Under the space basis of pay, however, it was possible to increase or decrease the amount of transportation to be purchased to the actual needs of the service, with the result that at the close of June 30, 1917, the regular authorized service was at the annual rate of \$58,518,478.

Thus the operation of the space basis is resulting, the report says, in the direct saving of millions of dollars to the government by reducing the car-mile service required of the railroads, and has released to the roads a large amount of car equipment and car space on trains.

The financial statement and reports upon operations of various branches of the service in detail discloses the introduction of economic methods, labor-saving devices, an improvement in efficiency through a strict adherence to the merit system, and a saving of expenses in the transportation and method of handling the mail. The statistical statements show an extension of the service—city, suburban, and rural.

NAMES OF BATTLES FOR C. P. R. STATIONS.—The Canadian Pacific has taken the step of renaming certain stations with the view to commemorate the glorious fields in which Canadian troops won renown. A beginning has been made in this direction. Milleta, on the Sherbrooke Division, has been changed to "Vimy," while the town of Enterprise, located on the Belleville Subdivision of the Ontario District, is to be called "Lens." All the fields in which the Canadians have won or shall win laurels will be commemorated in name by the C. P. R. in the christening of stations.



Photo from Underwood & Underwood, N. Y.

Siberian Railroad Bridge Blown Up Before the W. B. Thompson Red Cross Commission Train

Federal Locomotive Inspector's Report

Increase in Supervision and Inspection Believed to Be Necessary to Reduce the Number of Defects

THE sixth annual report of the chief inspector of locomotive boilers to the Interstate Commerce Commission has recently been made public and the following is an abstract of it:

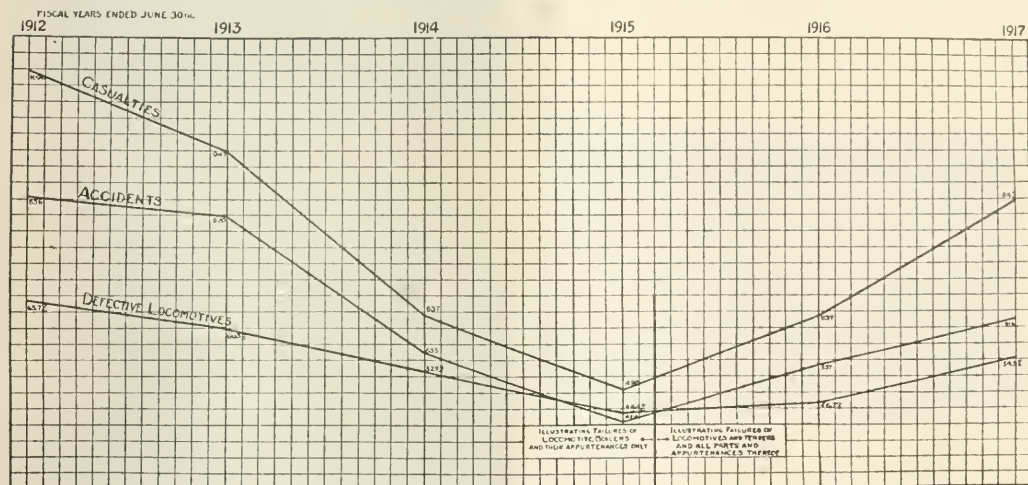
The tables given below show in concrete form the number of locomotives inspected, the number and percentage found defective, and the number ordered out of service on account of not meeting the requirements of the law.

They also show the total number of accidents due to failure from any cause of locomotives or tenders and all parts and appurtenances thereof, and the number of persons killed or injured thereby.

The amendment to the locomotive boiler inspection law did not become effective until September 4, 1915; therefore, the record for 1916 includes accidents and casualties investi-

Roundhouse and shop employees:			
Boiler makers	11	1	11
Machinists	8	1	11
Foremen	1	1	3
Inspectors	3	3	3
Watchmen	5	8	8
Boiler washers	7	10	10
Hostlers	6	6	6
Other roundhouse and shop employees	19	1	21
Other employees	5	22	7
Non-employees	1	23	3
Total	62	721	38
			599

Briefly summarizing, for the purpose of comparison, the record of accidents caused by failure of locomotives or tenders, or any part thereof, which were investigated by this bureau, as required by the law as amended, shows a total of 616 accidents, with 62 killed and 721 injured thereby. Of these accidents, 389, in which 52 persons were



Relation of Defective Locomotives to Accidents and Casualties Resulting from Locomotive Failures

gated under the amended law for 9 months and 26 days only.

LOCOMOTIVES INSPECTED, NUMBER FOUND DEFECTIVE AND NUMBER ORDERED OUT OF SERVICE

	1917	1916
Number of locomotives inspected.....	47,542	52,650
Number found defective.....	25,909	24,685
Percentage found defective.....	54.5	47
Number ordered out of service.....	3,294	1,943

NUMBER OF ACCIDENTS, NUMBER KILLED AND NUMBER INJURED

	1917	1916
Number of accidents.....	616	537
Number killed	62	38
Number injured	721	599

The following table shows the total number of persons killed and injured by failure of locomotives or tenders, or any part or appurtenance thereof, during the year ended June 30, 1917, classified according to occupations:

	Year ended June 30—			
	1917		1916	
Members of train crews:	Killed.	Injured.	Killed.	Injured.
Engineers	16	230	11	205
Firemen	21	304	12	225
Brakemen	13	60	9	74
Conductors	3	14	1	6
Switchmen	1	8	..	6

killed and 469 injured, were due to failure of locomotive boilers or some part or appurtenance thereof, and this may properly be compared with the record of accidents and casualties investigated by this bureau under the locomotive boiler inspection law, as shown in former annual reports. Two hundred and twenty-seven of the accidents shown in this report, in which 10 persons were killed and 252 injured, were caused by failure of some part of the locomotive or tender other than the boiler and its appurtenances, and were investigated under the amended law.

Much of the increase in the number of defective locomotives and the accidents and casualties resulting from failure thereof has, no doubt, been brought about by unprecedented operating conditions, which, together with the shortage of labor and material, has made difficult the proper maintenance of locomotives.

This, however, is not a justification for the operation by any carrier of locomotives that are in an improper condition for service, and the fact that some carriers by diligent efforts and careful supervision of repairs have not only maintained the condition of their locomotives, but have actually improved it during the past year, thereby increasing

operative efficiency, is evidence that it can be done even under the present exacting operating conditions.

The problems which have confronted this bureau in the matter of withholding locomotives from service when defective and in violation of the law, under the operating conditions which have existed since the declaration of war and during the months immediately preceding it, have been unusually difficult and have required the most careful consideration. The importance of the prompt, as well as safe, movement of trains has been constantly in mind, and every privilege consistent with the purpose of the law has been granted.

It is to be regretted that some carriers appear to consider a congestion of traffic as a legitimate excuse for operating locomotives that are known to be in an improper condition for service and in violation of the law, and this is done to an extent that, I believe, fully justifies the statement that on such roads running repairs are neglected to an extent which, if continued, will cause serious interference to traffic during the coming winter in spite of the most diligent efforts of the limited force of Federal inspectors to enforce maintenance of locomotives as required by the law.

Six hundred and sixteen accidents caused by failure of locomotives or tenders or some part or appurtenance thereof, including the boiler, have been investigated during the past year.

Accident investigation is only of value when the knowl-

position while engaged in firing such locomotive. Locomotives now in service should be equipped with a mechanically operated fire door, as above described, the first time they are shopped for general or heavy repairs, and all locomotives should be so equipped within a reasonable time; provided, that the above recommendation should not apply to locomotives equipped with mechanical stokers nor to locomotives using oil for fuel.

Second.—Air operated power reversing gear should also have a steam connection, with an operating valve conveniently located in the cab, and so arranged that in case of air failure steam may be quickly used to operate the reversing gear.

Third.—Holes for plugs or studs in boiler sheets should have a good thread the full thickness of the sheet in which they are applied, and all plugs and studs and other fittings should be screwed through the sheet. Plugs, studs, or other boiler fittings should not be repaired by calking, and

The first recommendation is based on the result of hun-



A Locomotive Held Out of Service on Account of Steam Leaks

under no circumstances should an attempt be made to tighten them while there is steam pressure on the boiler.

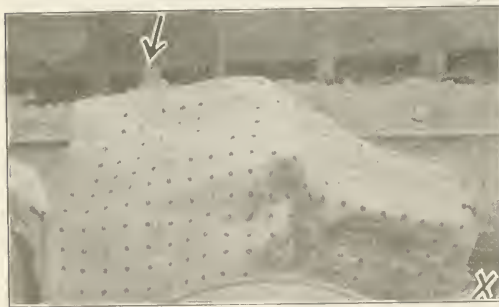
dreds of investigations of boiler failures of a character which permits the steam and water contained in the boiler to be discharged into the fire box. With the swing type door, which is at present largely used, such a failure invariably results in blowing the fire door open and discharging steam and boiling water, together with the contents of the fire box, into the cab of the locomotive, seriously or fatally burning persons therein. The automatic fire door



Steam Leaks Due to a Cracked Cylinder Found by the Government Inspectors

will remain closed if the failure occurs while it is closed; and if the failure occurs while it is open, it will automatically close the instant the fireman's foot is removed from the operating device, thus preventing the direct discharge of steam and scalding water into the cab of the locomotive.

The second recommendation is made because defects to certain types of brake equipment, which results in the loss of main reservoir pressure, not only renders the brake inoperative, but renders the air operated reversing gear also inoperative. When this occurs on a locomotive being op-



A Crown Sheet After an Explosion Due to Low Water

This crown sheet was welded by the oxy-acetylene process to the side, tube and door sheets. The arrow shows where it tore a piece out of the left side sheet and the cross shows how a small patch welded to the tube sheet was pulled off with the crown sheet.

edge gained thereby is used to prevent similar accidents. The result of a single investigation may not be sufficiently conclusive to base a change in methods or equipment thereon, but where investigations cover numerous accidents extending over a period of years, changes can be recommended which can reasonably be expected to be of substantial value in preventing accidents of a similar character.

The similarity of the effect of accidents of certain types clearly points to improvements in construction or in methods which will promote safety in the operation of locomotives.

The advisability of recommending additional rules at this time has been given careful consideration, with a view to avoiding, as far as consistent with the purpose of the law, regulations which would require additional equipment or labor during the war, except where it has been demonstrated that both safety and efficiency will be increased thereby.

In accordance with the above the following recommendations with the reasons therefor are made:

First.—New locomotives placed in service should have a mechanically operated fire door, so constructed that it may be operated by pressure of the foot on a pedal or push button, or other suitable appliance, located in the deck or floor of the cab or tender at a suitable distance from the fire door, so that it may be conveniently operated by the fireman from his

erated light, it results in the complete loss of control of the locomotive.

The third recommendation is based on an investigation of more than 200 accidents, due to plugs, studs, or other boiler fittings blowing out. In a large percentage of the cases it was due to improper application, as the plug, stud, or fitting had only been screwed part way through the sheet, while in some cases not more than two or three threads were holding in the sheet.

No formal appeal from the decision of any inspector has been filed during the year.

The accompanying chart shows the relation between the percentage of locomotives found defective and the number of accidents and casualties resulting from failure thereof and illustrates the result of operating defective locomotives. It does not accurately represent the results of the law, because prior to September 4, 1915, the law only applied to locomotive boilers and their appurtenances, while since that date it includes the entire locomotive and tender and all their parts and appurtenances; therefore, the increase in the percentage of locomotives found defective, also in the accidents and casualties since that date is largely due to the extension of the law to include the entire locomotive and tender.

It should be noted that the record of accidents and casualties at the close of the fiscal year ended June 30, 1917, is well below the record for 1912, although the record for 1917 includes 227 accidents and 262 casualties, due to failure of parts of the locomotive and tender which were not covered by the original boiler inspection law and therefore not included in the 1912 report.

COMMISSIONER MCHORD ADVOCATES UNIFIED GOVERNMENT CONTROL

The special report of the Interstate Commerce Commission to Congress, recommending unification of railroad operation, was published in last week's issue. Commissioner McChord filed a minority report, opposing the suggestion that the unification be allowed to be effected by the carriers themselves. In full his report was as follows:

The special report of the majority of the commission leaves unsaid some things which should be plainly stated, if prompt and sure relief is to be brought to the present transportation situation. That the lack of adequate railroad service, particularly in eastern territory, is serious at the present time and is a cause of grave concern for the coming winter months needs no demonstration. Every one knows it who knows anything about present business conditions. That the industries of the country engaged in making war materials as well as those not so occupied require the very best service which can be given by the railroads is also clear. I fully concur in the statement of the majority report that "it is necessary that our transportation systems be placed and kept on the plane of highest efficiency," and also that "this can only be secured through unification of their operation during the period of war." But the majority report takes the position, at least by implication, that this unification may "be effected by the carriers" themselves. With that judgment I wholly disagree.

The carriers' co-operative effort at the present time is in charge of the "Executive Committee of the Special Committee on National Defense of the American Railway Association." This committee in its public announcements calls itself the Railroad War Board. It is the fifth committee that the railroads have had in Washington to deal with the transportation situation since November, 1916. The first two of those committees were given no real authority, although the commission was advised by the executives that they had been given full power, or as it was expressed in the case of the first committee, "all the power of the execu-

tives." These committees, therefore, were unable to cope with the situation, despite earnest and praiseworthy efforts of their individual members who were hampered by the unwillingness of certain railroads, acting under the restraint of executive influence, to carry out their instructions. These facts have been reported by the commission, *Car Supply Investigation*, 42 I. C. C. 657. In that report both the majority and the minority expressed the view that the situation could be improved by a committee of railroad officers to act in co-operation with this commission if the committee were given plenary power by all the railroads. In apparent response to that suggestion a third committee was sent to Washington in January, 1917, but it also had not been given the promised power and was therefore not received. In February, a fourth committee was sent to Washington to enforce certain car service rules. Not all of the railroads believed that these rules were workable and hence the agreement giving power to this committee was incomplete and inadequate. With this experience behind it the American Railway Association, on April 11, 1917, formed its special committee on national defense, and centered the chief authority in its executive committee. The resolution by which this committee was formed recites that the railroads of the United States pledged themselves, with the government of the United States, with the governments of the several states, and with one another, that during the present war they would:

"co-ordinate their operations in a continental railway system, merging during such period all their merely individual and competitive activities in the effort to produce a maximum of national transportation efficiency."

It was understood that the co-ordination of railway operations in a continental railway system meant that cars would be used interchangeably and sent where they were most needed, that track and terminal facilities would be opened up to all railroads, so as to relieve congestion, and that locomotives would be at once requisitioned from some of the strong and less burdened railroads for use on the important lines which have been unable to give efficient service largely because they were badly in need of motive power. Yet as late as November 24 the carriers' committee made an announcement from which the following is quoted:

"The Railroads' War Board today adopted revolutionary measures in order to relieve the congestion of traffic on the eastern railways. It directed that all available facilities on all railroads east of Chicago be mobilized to the extent necessary to furnish maximum freight movement. The effect will be that to the full extent that conditions render it desirable these railways will be operated as a unit, entirely regardless of their ownership and individual interests."

"The operating vice-presidents of the eastern lines have been appointed a committee to operate as a unit all the lines involved, and have been given instructions and authority to adopt all measures which in their judgment may be necessary to relieve the present situation and assure the maximum amount of transportation." * * * "An important part of the plan adopted for the operation of the eastern lines is that of placing at their disposal the facilities of railways in other territories to such extent as may be necessary."

These measures—the pooling of cars, the operation of railways as a unit, the placing of facilities at the disposal of railways in other territories as needed—are essential steps in the co-ordination of railway operations "in a continental railway system," using the phrase of the resolution of April 11, but were not taken until November 24.

I do not wish to be understood as saying that the carriers' committee has not accomplished results; nor that the shippers have not co-operated with the carriers to get greater service from the available equipment, for the heavier car-loading has been a very material factor of improvement. But our experience with railroad committees during the past year makes me believe that no voluntary committee can accomplish what the situation demands. One of the principal reasons is that the element of self-interest, the traffic influence, is a persistent factor in postponing and resisting measures that seek to disregard individual rights in the effort to secure transportation results as a whole. The

"merely individual and competitive activities" and the established operating practices have their effect, despite directions or recommendations that have no sanction to enforce them except a voluntary agreement which is very general in character. There runs also in the activities of these committees the self-evident purpose to do whatever appears to be necessary to prevent the governmental authority from acting. For these and other reasons, which it is not necessary to state, I cannot concur in a report to the Congress which apparently acquiesces in a continuation of control over the transportation situation by a committee appointed by the carriers themselves. The suggestions with reference to the anti-trust laws, the anti-pooling provision of section 5 of the act, the desirability of government loans for capital purposes, and the regulation of security issues, undoubtedly have merit, but in my judgment their enactment into law will not make it possible for any committee appointed by the carriers to secure the full measure of transportation service which the present conditions demand.

The "unification" needed if our transportation systems are to be "placed and kept on the plane of highest efficiency," is the unification of the present diversified governmental control. At the present time there are several federal agencies authorized by law to issue orders or directions with respect to transportation. This commission, by the car service act, approved May 29, 1917, was given very broad powers to issue summary directions with respect to the movement, distribution, exchange, interchange, and return of cars. The priority director, designated by the President for that purpose under the act approved August 10, 1917, is authorized to direct that traffic essential to the national defense shall be given priority in transportation, and he has made certain orders of that character. The transportation of troops and material of war, under the amendment to the act to regulate commerce, approved August 29, 1916, is required upon the demand of the President to be given preference over all other traffic in time of war, and by direction of the army and navy departments and the United States Shipping Board preference orders have been given for the transportation of a very large tonnage of war materials and supplies of all kinds. The administrations controlling fuel and

food, to which adequate transportation is of course vital, have taken an active interest in the movement of those commodities through their appointed agents. Under this diversified control the carriers are not able to meet the requirements of the increasingly heavy tonnage which must be moved. In consequence the industries devoted to war purposes and those engaged in their normal business are suffering. There is no institution in which regularity of operation is more requisite than in transportation, but railroad operation is approaching a chaotic condition. A coherent plan must be worked out which shall provide for both the needs of the government in the energetic prosecution of the war and the needs of general commerce. It is imperative that war material be given preference in transportation but the financial sinews of war depend in large measure upon the successful operation of our manufacturing plants and business establishments.

I concur in the view that "the situation does not permit of temporizing," but I am convinced that the strong arm of governmental authority is essential if the transportation situation is to be radically improved. That authority must be unified to make possible action that is both vigorous and consistent. If the President elects to exercise the power given him, under the act approved August 29, 1916, to take possession and assume control of the transportation systems, I believe that vastly improved transportation conditions can be promptly secured. For this course legislation assuring the carriers a fair return may be appropriate. If the President does not so elect, it is my judgment that the authority over the regulation of railroad operations now vested in the several agencies referred to, with such amplification as may be necessary, should be promptly centralized by act of Congress. All of the forces now at work upon the problem, including the carriers' executive committee and its numerous sub-committees, could be at once utilized, under a single governmental administrative control.

THE TOTAL OF MANUFACTURES EXPORTED in nine months of 1917 is \$3,020,000,000 against \$728,000,000 in the same months of 1914, according to an analysis of The National City Bank of New York.



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A Light Railway Supply Depot Behind the British Lines

Pooling Railroad Equipment and Facilities

Discussion of the Physical Problems of Pooling Equipment and the Needlessness of Government Control

By Samuel G. Thomson

MUCH confusion is rampant in many minds concerning the pooling of the physical facilities of our railroads. Such questions are being asked as: How will it affect the financial return? How quickly and to what extent should physical results be obtained? As a consequence, government ownership and government operation are now advanced on every side as a remedy for the present financial and physical conditions of our railroads. Mr. Vanderlip foresees government ownership as a financial necessity, "Unless something radical is done to convince the public that railroad shares and bonds are good securities." He regards it not as a choice of method, but rather as a tragic alternative. The way things are now drifting, we may well agree with Mr. Vanderlip; since, where except in the government shall we find any other purchaser or source of credit, unless the American people have a change of heart?

EXPECTATIONS TOO HIGH

We hear much "half-baked" theory expressed at commission hearings and before various investigating committees; and there is also a lot of loose talk going the rounds in Washington and elsewhere concerning the breaking down of our transportation system, including extraordinary opinions as to what ought to be accomplished by the railroads in order to meet the present emergency. The expectations even in high government circles seem to be very much over-developed in regard to what should be accomplished with present facilities in relieving the congestion this winter, and considerable disappointment is already shown because the railroads are not making two cars grow up where one already has been performing 15 per cent more service than ever before.

The railroads *have been* almost performing miracles, in expanding the service-capacity of their cars by co-operation with the shippers, and by the thousand-and-one other services which they have been rendering without additional compensation. But yet we hear this talk that the railroads will be given a last chance to see what pooling will accomplish, and that if this does not bring the necessary result, the railroads then will have to be taken over and be operated by the government.

Our present danger then is, the running wild of expectations which are not limited by proper conception of the practical difficulties to be overcome and of the intricate ramifications of the railroad business. Much serious damage may be done to the transportation industry of the country unless governmental agencies are willing to work closer to the ground in placing reasonable limitations on what they consider will be an adequate performance by the railroads. But can we expect government agency and rule by commissions to determine what is a good performance in lines which are entirely out of their specialized activity? Perhaps we can arouse a public sentiment which will say, "Well Done!" before the lawmakers have another chance to add to the "garbage division" of our present regulatory statutes, and before another cry of "failure" has a chance to crowd the government into the railroad business.

It is granted that the railroads, in their capacity as public utilities, must have some regulation by representatives of the public, and we admit that part of our regulatory statutes are good and fair; but commission rulers, bureau-heads and legislators will do well in the present emergency to forget their radical ideas of progress, and to focus on the many ways

in which these agencies might help in the *relaxation* of past over-zealous expectations and restrictions which are already enacted into federal and state laws. To meet this situation the railroad officials are rightfully and patiently saying: "Tell us what you want done and we will be able to do it better than anyone else."

There is no better corps of executives and employees to be found in the world today for meeting emergencies than is now in charge of our American railroads from the presidents down to the crossing watchmen. Would it not be doing our part to accept the best that can be done by these men who *already are* our transportation representatives, rather than to consider new laws and to talk government operation; and thus to advocate "jumping out of the frying pan into the fire"? Let us then by public sentiment try to place limitations on what is to be considered a well performed task, so as to minimize the business mistakes of the war-business, and, incidentally, to preserve some future for our railroads.

It will be easy during the next few months to aggravate matters by expecting too much from a general pooling of railroad facilities and equipment. This co-operative operation will accomplish much in speeding up the car movement, and possibly in increasing the financial return to some railroads; but railroad men will not have time to talk for publication about their troubles, nor will they have the opportunity to present to government officials even a small part of the difficulties involved. It may, therefore, be all the easier for those unfamiliar with the details and routine of railroad operation to think that all there is to do is to start to use all of the equipment in a given section of the country on a completely unified system of the railroads throughout that section, and then to expect the results to be multiplied in proportion to the magnitude of the consolidation. It is surprising how many there are outside of the immediate railroad circle who have this idea, and who are willing to make a public expression of their railroad knowledge.

PRACTICAL DIFFICULTIES

With curtailed service and congestion ahead of us for this winter, regardless of the best that the railroads can do, it may be fitting to touch upon a few of the practical difficulties that will dampen the enthusiasm of those who expect too much from pooling operation and the relaxation of laws. It is unnecessary to dwell on the most vital drawback of all—the total available terminal facilities in a given congested district. The best the railroads can do in this is to keep surplus business away so that cars can be kept moving up to the capacity of the terminals.

Those who are unfamiliar may also think that it will be fine for the railroads to call on each other for locomotives. They may not stop to consider that all locomotives which "can turn a wheel" are now in use, even to the extent of robbing the passenger service to help the freight; nor may they be aware of the large proportion of time that a locomotive stands in the engine-house or shop waiting for material and supplies, even when at home on their own divisions. These delays are part of the practical operation of a railroad and apply particularly at points where the stores' department has neglected or has been unable to keep up the supplies and spare parts of the particular locomotives which are standard to their division. What will happen when these locomotives suddenly turn up on a strange railroad and make request

for the customary running repairs, or report to a strange shop as a cripple? These same locomotives will wait until the shop nearest to the breakdown makes the specialized broken part, or sends the proper size of packing, or orders a casting "from home"; and in this connection we might stop to reflect that a locomotive which can haul a hundred cars and which costs \$100,000 might be held up for a day or a week because the threads have stripped on a nut of the injector pipe, or on account of some even less serious ailment, if proper material could not be obtained.

A locomotive is not much good to a foreign road, or even to an outlying division of its own road, without a stock of standard repair parts in the storehouse at both ends of its regular run. It will not be necessary to relate the experience of a "tramp locomotive" which on any railroad finds it necessary to work in a freight pool over a number of scattered divisions—any more than to say that it gets "a lick and a promise," "a trip on three legs," "leaking steam: cannot see ahead," "tied up the whole division," "sent home light to main shop for repairs."

"Mr. Government Operator" may say that the railroads will have to keep necessary material on hand, as well as competent men to handle and to order this material and to make proper repairs. He may forget, however, that most kinds of railroad materials are now very hard to get, and that many of the railroad's former expert workers are in the trenches or training camps, or in a neighboring shipbuilding plant getting double the wages that a railroad can afford to pay. He may also forget that in the enginehouse they are now doing the best they can with many men who hardly know the difference between a monkey-wrench and a fire-hook. What practical remedies will a change in railroad management accomplish?

Some may expect that large consignments of locomotives will be brought quickly from the West and started to work in hauling trains through the districts where the railroads do not have enough motive power for present business. They may not stop to think that the shop and locomotive terminal facilities of these eastern roads are already overtaxed in taking care of their own equipment. "Mr. Government Operator" may say that these shops and locomotive terminal facilities will have to be made adequate for these additional locomotives by the transfer of machine tools and employees from Western lines, in order that results may be obtained this Winter. He, of course, does not appreciate how much the time element is a factor in such operations, and that if anything is attempted in making transfers of this kind, it would be a matter of many months before substantial results could be shown and the new organizations working smoothly.

The mere matter of planning just what transfers of shop facilities can and should be made is a stupendous expert task which would be thrown upon the railroad mechanical organizations at a time when they can hardly keep the wheels turning with their present facilities and equipment. It would, therefore, seem that transferred mechanical assistance in any large proportion will be out of the question for this Winter in relieving the congestion and in reducing the lack of cars and power which is almost inevitable. This time element, therefore, is food for thought for those who will be inclined to say that the railroads are breaking down and have failed in their latest pooling project; and again we may inquire what practical means these critics would bring to bear in order to get quicker results under government operation.

Likewise, the advocate of nationalization, if in his liberality he should depart so far from the teachings of his cult as to advocate that the Government should assume responsibility for its acts in trying to obtain net returns from its operation, would do well to ponder that an effective shifting of locomotives with their standard extra-parts and supplies, as well as a transfer of machinery and men, would be very

costly for the railroads. This extra adjustment burden would have to be absorbed in the operating expense of his Ideal System, as is now probably expected of the railroads involved in the pooling plans, and he might find that this, with other unexpected costs of operation, might transform his "net earnings" into an additional federal tax from the people for the benefit of transportation.

In the pooling of freight cars, we may fare a little better than with locomotives, since it has been the business of the freight car to travel around the country and to carry its load to its destination without much transfer of lading. However, there are also many classes of cars which are quite domesticated in their activities. They might be classed with the locomotive which only likes to travel a hundred miles at a time, and that, too, on its own home road. These specialized cars are particularly adapted for local service in certain districts and have not become accustomed to the "Cooks Tour" circuit. They represent the largest part of the car equipment of the country, since it is the box car principally which has become a familiar visitor to shops away from home, as well as a vulnerable subject for the foreign road-repair billing clerk and a liberal contributor to the other "Customs charges" of the freight car pool.

We cannot then hope that all equipment of the various railroads can be thrown together satisfactorily and economically for general utility, as even in the "traveled" box car class we all remember when yards and shops were congested with foreign cars waiting for material from home; and we also recall the increased time and cost for repairs, on account of their repair parts not being standard and not carried in stock on the foreign roads. And to appreciate our troubles still further, we may well consider how much mileage we would get in a country-wide pool from the specialized home varieties of equipment, which forms a large part of the total.

Our railroads must come to an enlargement of the "Traveler Division" of their equipment. They must at least add to it hopper coal cars and gondolas; and it may be that the present emergency pool may serve to hasten the adoption on the various railroads of the same designs for these several types of cars in this "traveler" division. But this is not a matter to be accomplished this winter; and it is enough to say in pointing out this defect, that there are probably a thousand different railroads in the country with a corresponding thousand different designs of box cars of 60,000 capacity, which have a thousand different designs of center sills no one of which can be substituted for the other. We may understand how difficult this lack of standardization makes our repair and car service problem when we multiply this number of designs by the number of different capacities of box cars—not to mention the many different kinds of specialized cars which have heretofore been operating in their home districts. Our immediate car pool operation will save much empty mileage and will improve car service; but it also presents many difficulties, and the remedy is not a very rosy one to solve by commission rule. We are not yet ready for *economic* pooling of railroad car equipment. The situation however is not hopeless; but a discussion of a practical solution which can be developed gradually by the railroads themselves to greatly help future operation is hardly within the scope of this article.

CONCLUSIONS

The advocates of Government operation who expect big things from this momentous pooling departure will see, therefore, that even with car equipment—the most flexible and adaptable agent for pooling—there are "many bugs in the ointment," which may interfere with rapid progress and with the accomplishment of the ideal which they think ought to be obtained by working the railroads as one united national system. So let us conclude that the best that can be done will be by the co-operative effort of our railroad operat-

ing executives now assembled; that whatever is accomplished by pooling probably will be much more costly than normal operation—as far as the use of equipment and mechanical facilities is concerned; that our expectations for relieving the congestion and for the decrease of car shortage should not be distorted; that government operation cannot be more than a costly and roundabout attempt to accomplish results by means of the railroad executives who are *already at work*; that there is rough sledding ahead for the railroads even after the war; and that not all of the way will be made smooth by the raising of rates.

For our friends who argue that the railroads do not need an increase in rates on account of the many savings that will be realized from a united and concentrated railroad operation, we may add that they should consider how far these various physical and mechanical difficulties will offset the advantages of rerouting, redistribution and other benefits of co-operative pooling. And for the attention of our lawmakers and commissioners; let them become substitute when they speak of "taking over the railroads." Have they anything constructive to suggest in meeting the very practical difficulties mentioned above? "Anyone can tear down a house, but it takes a carpenter to build one." May we not warn, that the house cleaning which they suggest will but resolve itself into a "stir-up" for a protracted period which, if it does not break up some of the furniture, will only result in putting the bed where the bureau was, and in changing the railroads from the credit to the debit side of the ledger; and then we would proceed along as before, in having some bureau-agent of the government ask our railroads' experts to go ahead and do the best they can.

What particular results and what practical remedies have these same advocates in mind when they say that the President will have to operate the railroads as a military necessity? Let us answer quickly, that the military necessity of the country today is to keep the many thousands of mines and manufacturing plants running to capacity and to get their product on the boats. There is no one in America today who knows as well how to do this as the expert operating and traffic officials of the railroads; and let us venture to suggest that, with the supervision of their own War Board and with a few general necessities indicated by the governmental departments, it might even be left to the judgment of our railroad experts, who are in daily contact with the industrial world, to use discrimination as to which plant was the most important. Our priority troubles might then melt away and no longer be a hindrance to transportation. It might be well for the country if we could "let our railroad officers in on" this managing of the war business. We greatly need this army of expert help, and at its highest efficiency.

Is *pool operation* the misleading element in all this confusion of generalities? If it is, let us not be deceived in thinking that all we have to do is for the Congress to cancel some of their anti-pooling mistakes and then throw the railroads together for one grand "clean up" under bureaucratic operation. Pooling has its bad points as well as its good ones, and a few of the former are cited above in *only one department* of the railroad business. Our railroad officers and committees will understand best how to get the most out of pool co-operation during the war, both as to physical and financial results. Enforced pooling into undesirable channels would be a catastrophe, and might result, with reference to car equipment, in our finding on our hands a surprisingly increased proportion of it out of service for repairs at a time when it was most needed. This enforced pooling is probably what many have in mind when they think of government control and a country wide transportation system.

We dare not "swap horses in the middle of the stream"; and—except for a temporary and reasonable relaxation of

restriction on co-operation—we cannot, by annulling or by making laws, expect to create new methods and new conditions to help the railroad during the war which would not at the same time be just as efficient and just as profitable after the war. For the present emergency, the railroads could agree among themselves to share their terminals and routes, and perhaps some of their earnings, if laws are adjusted accordingly; but that is about as far as it should go; and in going this far, let us bear in mind that the railroad executives should be allowed to use their own pooling methods.

Co-operative competition with less regulation among privately owned railroads, should be our plan now and for the future. A little perusal of some of the troublesome and practical details of railroading may sober the judgment of those who are advancing large general theories for the revolution of the transportation business of our country. Let us discard the pet phrases: "Take over the railroads," "Government Ownership," "Unity of Railroads," "Country-Wide Pool"; and let us think more about co-operation under a plan which will not transform the railroads into absolute utilities but rather will allow them for the present and in the future to remain partially in the field of private business under reasonable business competition and co-operation. Our railroad executives are anxious to pool for war service their terminals and their various other facilities in which they have an advantage over their competitors; but after the war, they should have the exclusive benefit of these facilities to be used in reasonable business competition, if our railroad systems are to be developed and are to keep step with the needs of the country. Some people cannot understand how we could have competition and co-operation at the same time; but if they were willing to get a little closer to the greatest business men which the country has produced and many of whom are now donating much of their time to the Government for service and for consultation, they would soon learn that this joining of hands of competition and co-operation is the principle which will have to be relied upon to work out the salvation of our railroads.

HOSPITAL CAR FOR THE ERIE

To meet the demands of the Government for appropriate cars in which to transport sick or wounded soldiers, the Erie has remodeled a 70-ft. steel underframe parlor car, as



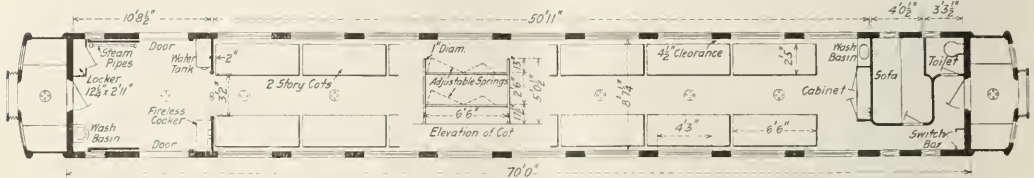
Erie Hospital Car

shown in the illustrations, providing it with 28 adjustable cots placed in two tiers. The car is provided with a receiving and supply room 10 ft. 8½ in. long, with a sliding door

at each side, at one end of the car. At the other end is a small rest room for the nurses, provided with a sofa and lavatory. The main portion of the car is about 50 ft. 6 in. long and contains seven two-story cots on each side.

The two-story cots are of a new design furnished by Frank A. Hall & Sons, New York. The springs of these cots are adjustable to any desired position for a patient's back or legs. This is clearly shown by a sketch on the floor plan of the car. The cots are finished in white enamel.

The supply room contains a fireless cooker, drinking water



Floor Plan of Erie Hospital Car

tank, wash basin and supply locker. The annunciator on which calls from any part of the car are indicated is also located here. It is separated from the main compartment by heavy rubber curtains.

The car is equipped with electric lights, the lighting fix-



Interior View of the Erie Hospital Car

tures being located on the side decks. Emergency lights are provided by Pintsch gas lamps located in the center of the upper deck. The interior finish of the car is a light gray, which is easy to the eyes.

TWENTY MEN IN GAS MASKS IN AIR-TIGHT CAR.—An abandoned freight car was recently used as a gas house at Camp Meade, Md., and twenty chaps of the 27th Engineers for two hours battled against the deadly fumes similar to those which the Huns unloose on the troops overseas. The car had been prepared for several days for the test and had been hermetically sealed. The men were cautioned to adjust the masks before they ventured into the danger zone, and the moment the car door was slammed the gas was turned on full force; every man came out apparently without a single handicap other than the weight of his mask.

WASHINGTON CORRESPONDENCE

WASHINGTON, D. C., December 11, 1917.

FOOD, FUEL AND MILITARY SUPPLIES GIVEN PRIORITY

A general priority order to the railroads to give preference in car supply and movement to fuel, food and military supplies was issued by Judge R. S. Lovett, priority director, on December 7. The question of what such an order should provide had been the subject of numerous conferences with railroad and government officers for several days. Both the

food and the fuel administrations had asked for general orders but the railroads had opposed the idea of too sweeping an order unless some plan were put into effect which would provide for a co-ordination of the requirements of the government. The Railroads' War Board expressed approval of the form in which the order was issued but urged that its success would depend upon the co-ordination of the traffic management of government business and relations with the railroads. The order provides for preference in the following order:

First—Steam railroad fuel for current use.

Second—Live stock, perishable freight, food and feed.

Third—(a) Shipments of military supplies when consigned direct to the United States government or the authorized officers of the United States army, navy or shipping board, or to the Allies or the proper representatives thereof, destined to any cantonment, post or encampment, to any point of export for movement thence to Europe, to any arsenal or navy yard, or material to any shipbuilding plant under contract to the United States shipping board for the sole purpose of constructing vessels for that board.

(b) Other shipments for the United States government, as the same may be authorized from time to time as necessary in particular cases, but only upon request of the United States army, United States navy and United States shipping board, through a designated officer or representative of the respective departments, located in Washington.

Fourth—Coal to and for by-product coking plants, and not subject to reconsignment.

Fifth—Preference and priority in movement only to coal for current use, but not for storage, consigned direct (and not subject to reconsignment) to hospitals, schools and other public institutions, retailers of coal for use in supplying domestic consumers only; and to coal, coke and raw materials for current use, but not for storage, consigned direct (and not subject to reconsignment) to blast furnaces, foundries, iron and steel mills, smelters, manufacturers engaged in work for the United States government or its Allies, public utilities (including street and interurban railways, electric power and lighting plants, gas plants, water and sewer works), flour mills, sugar factories, fertilizer factories and shipbuilders; also shipments of paper, petroleum and petroleum products.

ROUTING EXPORTS VIA SOUTHERN PORTS

The desirability of routing as much as possible of the export freight via Gulf and South Atlantic ports instead of North Atlantic ports, in order to keep it out of the congested

eastern district, has received a great deal of attention at the hands of railroad and government officers in the past two weeks and although no general plan has been adopted a great deal has already been accomplished. Edward Chambers, vice-president of the Santa Fe and head of the transportation division of the Food Administration, has devoted special attention to the subject and has arranged for routing much of the exported food supplies for the Allies via Southern ports. Following a meeting of the Export Co-ordinating Committee on Wednesday, it was announced that instructions had been issued by the Traffic Executive representing the Allies that all grain for the Allies originating west of the Indiana-Illinois line will be shipped through the Gulf ports. Orders were also issued to divert to the Southern ports over 100,000 tons of billets and bars.

To relieve the congestion on eastern lines and enable the return of box cars to western lines for use in handling grain,

ing to the western lines to be returned to that section for use, and at the same time allow more prompt handling of the freight in the eastern section of the country by lessening the number of cars to be handled by the eastern railroads.

The embargo will stop movement of corn and oats into the already badly congested eastern section of the country, and a supply of corn and oats for domestic consumption within the embargoed territory will be secured at points of production within that territory.

The western lines are considerably short of the number of box cars they own, and need these cars very badly for grain movement at this time. The Car Service Commission a short time ago issued an order requiring eastern lines to deliver to western lines approximately ten thousand box cars to relieve conditions the present embargo is designed to overcome, but the returns to date show rather light deliveries to the western lines.

STATE COMMISSIONER TESTIFIES BEFORE NEWLANDS COMMITTEE

The Newlands Joint Committee on Interstate Commerce on Tuesday resumed its hearings on the subject of railroad regulation for the purpose of hearing from state railway commissioners, members of the legislative committee of the National Association of Railway and Utilities Commissioners. Carl D. Jackson, chairman of the Wisconsin Railroad Commission, opposed the proposal of the railroads that regulation be centralized in the hands of the federal government, saying that before destroying the power of the states Congress should make a study of what is wrong in state regulation that should be corrected. Mr. Jackson was in favor, however, of federal regulation of issues of stocks and bonds.

Mr. Jackson described the work of the Wisconsin commissions to show that it is not open to some of the criticisms that the railroads have made of state regulation in general. "Utilities are regulated in Wisconsin," he said, "on the theory that regulated monopoly is desirable and that competition is undesirable. It is cheaper for the people to have one company do the work than to have two competing companies. In the end the public pays the cost of competition."

"We allow no duplication of facilities and require each company to obtain a certificate of public necessity. Some utilities have been taken over by municipalities but I believe the tendency in Wisconsin is against public ownership. Most of those that have been taken over are water companies because the electric light companies that are owned by municipalities are not doing well."

Mr. Jackson said that intrastate rates in Wisconsin are not in conflict with interstate rates because the commission has always taken the interstate rates into consideration in fixing them and that they are in general slightly higher per mile than the interstate rates because of the shorter haul over which the terminal expense is distributed. He said there had never been any conflict between the state rates and the interstate rates or between the state authorities and the Interstate Commerce Commission.

He opposed the centralization of regulating authority, saying: "In my opinion such a consummation is not sound, not founded on good public policy and in the long run would not be beneficial to the carriers themselves. The functions now performed by the state commissions have got to be performed by some one and if they are to be performed by the federal government its powers should be as complete and thorough as that now exercised by the states."

There was some discussion by members of the committee of discontinuing the investigation for a time, because the President was expected shortly to take over the operation of the railroads, which would postpone questions of railroad



The New York Tribune.

Interrupting an Emergency Case

the Commission on Car Service at the request of the United States Food Administration on December 6 declared a zonal embargo, effective on December 8, against the loading, re-consignment or movement of carload corn and oats into territory south of the Canadian boundary, east of the line separating Wisconsin and Michigan, Indiana and Illinois, and north of the Ohio and Potomac rivers from points outside. No exceptions to this embargo will be made except as authorized by Commission on Car Service. It is understood that a supply of corn and oats for domestic consumption within the embargo territory may be secured within the same territory.

For some time the congestion on eastern lines has been absorbing and holding cars properly belonging to the western section of the country. It is expected that this embargo, in addition to the diversion of a large volume of traffic by shipments of grain and other supplies for the Allies to the Gulf and South Atlantic ports, will allow the cars belong-

regulation. It was decided, however, to hear some of the state commissioners who had appeared.

WESTERN RATE HEARING POSTPONED

The hearing before the Interstate Commerce Commission set for December 17 for the purpose of considering the application of the western railroads for increases in freight rates has been indefinitely postponed at the request of the special executive committee representing the western lines.

E. S. Keeley, vice-president of the Chicago, Milwaukee & St. Paul, and chairman of the committee, wrote to the commission saying that the recommendations in its special report to Congress and the uncertainty as to the action to be taken

A PATENTED PASS FORM

What is believed to be the only patented pass form now in use was recently devised by Charles S. Sweet, Jr., chief clerk in the president's office of the Pullman Company, Chicago. The patented feature, which is applicable to round trip passes only, provides for a uniform wording on the going and return coupons of the pass, with the result that the only difference between the two coupons is that the positions of the starting and destination points are reversed with reference to the prepositions used to indicate the extent of the trips authorized. To illustrate, if the going portion of the pass reads "from Chicago to New York" the return por-

A.P. 855 THE PULLMAN COMPANY TRIP PASS STUB		A.P. 855 THE PULLMAN COMPANY TRIP PASS	
THIS PASS IS NOT TRANSFERABLE AND DOES NOT ENTITLE THE BEARER TO OCCUPY FREE THE ACCOMMODATION WITH THE FIRST COUPON.		THIS PASS IS NOT TRANSFERABLE AND DOES NOT ENTITLE THE BEARER TO OCCUPY FREE THE ACCOMMODATION WITH THE SECOND COUPON.	
FROM <u>CHICAGO</u>	TO <u>NEW YORK</u>	FROM <u>CHICAGO</u>	TO <u>NEW YORK</u>
ACCIDENT		ACCIDENT	
VIA		VIA	
ISSUED BY		ISSUED BY	
COUNTERSIGNED BY E. H. VIGAN OR A. A. MARSHALL		COUNTERSIGNED BY E. H. VIGAN OR A. A. MARSHALL	
RECORDED BY		RECORDED BY	

Top View of Pass Form

by Congress upon them, as well as the uncertainty as to the disposition to be made of the demands of employees for wage increases prompt the western carriers to ask for a postponement. A further consideration moving them to make this request, he said, is that by the early part of 1918 when the above uncertainties will probably have been cleared up, the carriers will be in a position to submit figures covering operations for the entire year 1917 and showing the extent to which the maintenance of road and equipment has been deferred.

LEGISLATION

The Senate and House judiciary committees both held hearings on December 6 on the resolutions introduced at the

tion reads "from New York to Chicago," and not "to Chicago from New York." Consequently, on every pass coupon presented to a conductor, the starting point of the train is the first entry and is preceded by the preposition "from," while the destination of the train is the second entry, and follows the preposition "to."

The pass is in triplicate-fold form so that the stub and two coupons may all be filled in at one time. The marked simplicity of the form not only reduces to a minimum the chance of error in collection, but saves clerical expense necessitated when the wrong coupon is lifted because of the unusual wording of the printed matter on the pass or the color of the coupons, conserves time lost in filling out more

A.P. 855 THE PULLMAN COMPANY TRIP PASS		A.P. 855 THE PULLMAN COMPANY TRIP PASS	
THIS PASS IS NOT TRANSFERABLE AND DOES NOT ENTITLE THE BEARER TO OCCUPY FREE THE ACCOMMODATION WITH THE FIRST COUPON.		THIS PASS IS NOT TRANSFERABLE AND DOES NOT ENTITLE THE BEARER TO OCCUPY FREE THE ACCOMMODATION WITH THE SECOND COUPON.	
FROM <u>CHICAGO</u>	TO <u>NEW YORK</u>	FROM <u>CHICAGO</u>	TO <u>NEW YORK</u>
ACCIDENT		ACCIDENT	
VIA		VIA	
ISSUED BY		ISSUED BY	
COUNTERSIGNED BY E. H. VIGAN OR A. A. MARSHALL		COUNTERSIGNED BY E. H. VIGAN OR A. A. MARSHALL	
RECORDED BY		RECORDED BY	

Bottom View of Pass Form

last session of Congress at the request of the railroads to suspend until January 1, 1919, the provisions of Section 10 of the Clayton anti-trust law applying to the purchase of materials. These provisions have already been suspended twice since the law was passed. The Senate committee voted to recommend the passage of the resolution with an amendment providing that the postponement shall apply only to existing companies, and it was passed by the Senate on December 7. Representative Sabath, on December 5, introduced a joint resolution. H. J. Res. 172, providing for the taking over by the government during the period of the war of the railways and coal mines. The resolution was referred to the Committee on Interstate and Foreign Commerce.

THE BEST OPERATING MAN.—The Southern Pacific red cap porter who can carry three suitcases through a revolving door.—S. P. Bulletin.

complex forms; reduces the chance of error in issuance; and relieves conductors of the duty of filling in forms, obtaining passengers' signatures when but one coupon for the going and return trip is provided, and performing other essentially clerical work which should properly be done in the pass department. The pass has the additional advantage of being valid with but one countersignature, instead of two as required by some companies. It is now being used by the Pullman Company, the Chicago, St. Paul, Minneapolis & Omaha and the Minneapolis, St. Paul & Sault Ste. Marie.

RAILWAYS AND AERIAL ATTACKS.—On the whole, railways are singularly immune from aerial bombs, says Major Redway, the military critic of the London Globe, due to the fact that correct aim is practically impossible from aircraft, while even a four-track road offers a very narrow target to an aeroplane at a height of anything between 2 and 4 miles.



Timber Shed Construction

Snow Shed Construction in the Cascades

The Great Northern Has Added 17,360 Ft. of New Protection, 6.7 Miles of Line Out of 9 Now Under Cover

DURING 1916 the Great Northern built 14,560 ft. of snow sheds, and 281 ft. of concrete arch, and drove 2,519 ft. of tunnels in the Cascade mountains, to extend the protection against the snow slides prevailing in this territory during the late winter and spring months. Added to the work previously done the total length of snow sheds or tunnels built for this purpose in this vicinity is now 8.4 miles. Of this total 6.4 miles is west of the Cascade tunnel and, adding to this the length of the spiral tunnel at Martin creek, a total of 6.7 miles of track is now under cover in a distance of 9 miles. The longest continuous section of snow shed in this distance is 9,790 ft.

The construction of the snow sheds has extended over a number of years, previous work having been described in the *Railway Age Gazette* of January 13, 1911, and April 17, 1914. The snow slides on the west slope of the Cascade mountains are the result of the extremely heavy snow fall of this region, which has totaled as much as 55 ft. in a single winter and the Chinook winds which cause sudden thaws of the heavy snow beds. In recent years the more severe troubles have occurred in cycles of three years; thus the early months of 1907, 1910, 1913 and 1916 caused relatively more trouble than the corresponding periods of other years. Naturally the protection work has been most active in the construction seasons following these bad winters.

The initial protection was provided at situations where the slides had actually occurred, while later work comprised the extension of these sheds over other portions of the track subsequently suffering from slides as well as the repair of portions built previously. As the result of this policy snow sheds have been gradually extended over larger proportions of the tracks within the limits of snow slide action.

THREE TYPES OF SHEDS WERE TRIED

The early snow sheds were all of timber construction, but in 1910 and 1911 a total of 2,462 ft. of double track reinforced concrete sheds was constructed. This type has not

been used in subsequent work because of its expense. In 1913, 14,594 ft. of snow sheds was built, of which 10,094 ft. was of all-timber design and 4,500 ft. was of a composite design, with a timber roof over the tracks and a retaining wall of plain or reinforced concrete on the uphill side to take the place of the extensive timber work required in that position in the all-timber design. In 1916, when a total of 14,560 ft. of sheds was built, 12,309 ft. was of the all-timber design, while only 1,970 ft. was of the combination type. Besides these a total of 281 ft. consisted of reinforced concrete arches serving as extensions for three tunnels built for protection purposes.

Thus it is seen that there has been an almost complete return to the original form of construction. The prime reason for this is the high cost of reinforced concrete as compared with timber at a point located in the heart of the Douglas fir region. The investment in concrete snow sheds can be justified only if providing for the double track which must unquestionably be built before the life of reinforced concrete construction would be completed. At the same time it has not been deemed advisable to go to as large an investment as the reinforced concrete sheds would require, because of the degree to which it would commit the railway to the present location of the line. Also the old timber snow sheds can be built in less time than either the all-concrete or the combination sheds, a factor that was of no little importance in planning the completion of the construction program in the short working season.

WHERE THE SHEDS ARE LOCATED

As stated previously the bulk of the snow shed construction has been west of the Cascade tunnel. The location of the line between the tunnel and Scenic has been described previously in detail and is shown in the map. For this entire distance the line occupies a mountain side that has been swept almost bare by repeated slides. Between Windy Point and Scenic the two higher legs of a double loop are located

on benches in the same slope, one above the other so that the line is twice exposed to the same slide. East of the summit tunnel until last season very little snow shed construction was done, only 2,701 ft. of protection having been built, and this was scattered in sections not exceeding 500 ft. in length over the 33 miles between the east portal of the tunnel and Leavenworth.

West of the summit the work for 1916 consisted partially in the repair of old sheds but primarily in the construction of additional protection. The repair work was entirely between Tye and Embro, where 1,970 ft. of combination sheds and 526 ft. of all-timber sheds were constructed to replace old timber sheds built at different times between 1907 and 1915. West of Embro the work consisted entirely of additional timber sheds and two tunnels driven through shoulders in the mountain side to eliminate dangerous sections of track skirting the face. East of the summit, 7,358 ft. of new timber protection was added to the 2,701 ft. previously built, but as this was scattered over 33 miles of line it does not give the spectacular effect of the work on the west slope.

DESIGN

The design of the timber sheds differs but little from that developed in the past, through years of continued observation of the effect of the snow slides. The structural details of the snow sheds were discussed in detail in the article appearing in the *Railway Age Gazette* of April 17, 1914. The structure serves essentially as a chute for conducting the masses of snow, ice and debris from the hillside above the track to the slope below. It must serve to resist the impact of a rapidly moving mass that remains on the roof only momentarily and it must be able to carry the dead weight of a slow-traveling bank of snow that may concentrate on the roof and remain there until the summer sun melts it. Of great importance in the design is the resistance to the sliding action, which in the all-timber sheds necessitates the use of ample sway bracing and a set of batter posts on the down hill side, acting in conjunction with knee braces in the openings over the tracks. In the combination shed the friction is resisted by tying the roof timbers to the top of the retaining wall on the upper side.

This feature was improved in the design used in the last work. Resistance to sliding was provided in the earlier design by a row of dowels passing through the roof timbers and embedded in the top of the wall. This was replaced in the 1916 design by an improved connection, which is shown in one of the drawings. The 16-in. deck timbers are notched on the under side to engage the upstanding leg of a 4-in. by

This parapet is equipped with a 6-in. channel to take the bearing of the bolts and is reinforced adequately to resist the horizontal thrust.

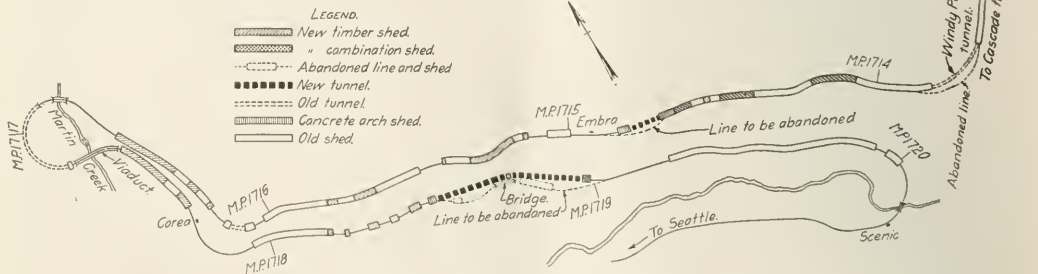
To form an effective chute for the snow the shed construction must be extended up the hill until the plane of the new roof intersects the mountain slope. If the slope is steep this is accomplished readily, but when it is flat the wide extension of the structure required in the all-timber design entails the use of large quantities of lumber. The combination shed overcomes this by introducing the retaining wall of either mass or reinforced concrete, the space behind the wall being filled to the desired slope with earth.

One feature requiring special treatment is the drainage of the mountain side to carry away the water from the melting snows. Where the discharge is small this can be accomplished readily in the all-timber design by building a flume on the roof of the shed, but the demands of permanent construction in keeping with the design of the combination sheds require something more substantial. One solution is the use of a concrete box culvert passing underneath the shed as shown in one of the drawings.

LARGE AMOUNT OF LUMBER REQUIRED

Some idea of the magnitude of the project can be obtained from the fact that 37,550,000 ft. b.m. of lumber was required to complete last season's work. Of this amount 18,800,000 ft. b.m. was used for the timber sheds on the east slope, while 18,255,000 was used on the west slope. Of the latter 16,128,000 was in the all-timber sheds and 2,127,000 in the combination sheds.

The progress in the shed construction on the west slope was about 24 track feet per day, which, with an average of 2,000 ft. b.m. of lumber per track foot of shed was equal to a daily consumption of 48,000 ft. b.m. of lumber. The site of the work did not afford any storage space, as



Location of Snow Sheds West of Cascade Tunnel

5-in. T-bar securely fastened to the masonry bearing. To the upper sides of these timbers are attached $\frac{7}{8}$ -in. by 12-in. plates, extending longitudinally for the entire length of the shed. At intervals of 5 ft. along these plates cast-iron lugs are secured which serve as stirrups to receive $1\frac{1}{2}$ -in. bolts passed through a parapet at the rear of the retaining wall.

all lumber received from the mills had to be sorted in a yard at Goldbar, 40 miles west. On the east slope the situation was much more favorable as a storage yard could be located at Merritt, situated about centrally in the construction territory. The concentration of lumber at these two storage points was commenced some time before the construction started in order

to insure a supply that would preclude any delays to the work.

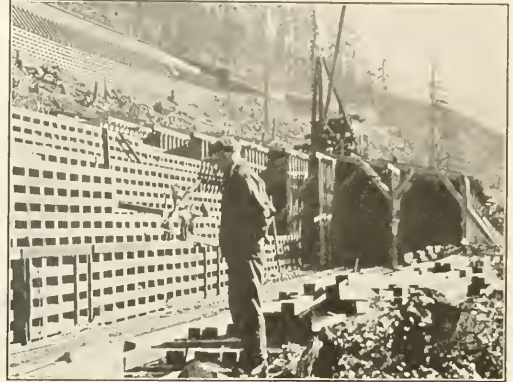
From the storage yards the cars were loaded with pieces substantially in the quantity and order used daily in the construction of the sheds, and as the erection crews were working simultaneously at a number of sheds and had to be served almost constantly, a large amount of work train service was

the inspector as fast as the material was erected or was secured by means of a survey of the completed work.

West of the summit about 200 men were employed on the timber sheds, 130 on the combination sheds, 200 on the lower tunnels and 30 on the upper tunnel, just east of Embro station. The timber was erected by stiff leg derricks mounted on skids on the roof of the completed shed, so that they could



Retaining Walls for Combination Sheds



Snow Sheds on Two Levels

required. On the west slope this was equal to an average of four work trains daily in addition to a train supplying concrete materials. About 1,000 cars of sand and gravel were required for the concrete work, and about 2,500 cars of timber.

All of the work was done by contract. The railroads furnished the lumber and paid the contractors on the basis of

be moved forward as the work progressed. Only a small amount of framing was required and this was done on the ground just previous to erection. Holes were drilled with power-driven tools.

CONCRETE WORK

The plant for the construction of the concrete walls for the



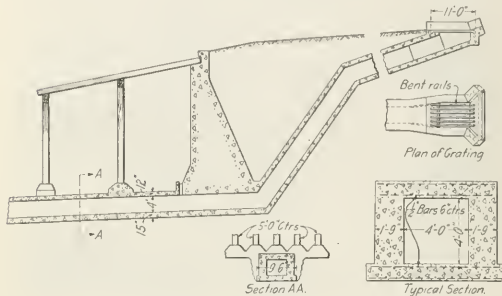
Sheds on Two Levels Near Martin Creek Loop

the amount of lumber erected. The railroad engineering force made up a complete bill of all lumber, showing the actual feet b.m. of all the lumber placed as well as the commercial feet b.m. delivered. This billing was made up by

combination sheds is shown in one of the photographs. It consisted of two bins, one for sand and one for gravel, standing on a framework of sufficient height so that a mixer receiving materials by gravity from the bottoms of the bins

could discharge concrete directly into cars standing on a track well above the top of the wall. These bins were filled from cars by a clam-shell bucket hoisted by a stiff-leg derrick standing on a platform spanning the main track. The cement was elevated from a storehouse alongside the track by means of a chain conveyor.

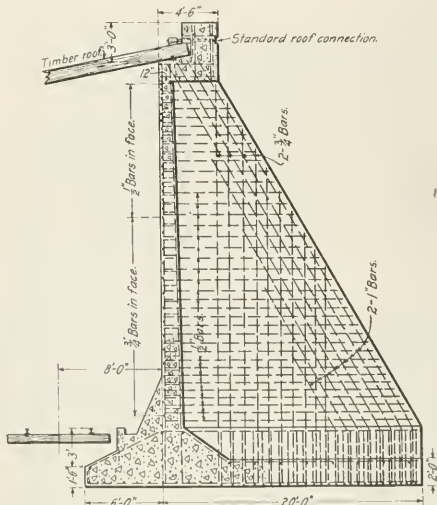
Concrete was delivered to the forms in small narrow-gage dump cars operated on a trestle supported over the wall by frame bents that were placed astride of the forms. The cars were moved back and forth by a hoisting engine and cables. The location of the plant was generally made central with



A Culvert Passing Under the Snow Shed

respect to the length of the shed so that the concrete cars moved both ways from the mixer, thus reducing the length of haul to a minimum.

The forms for the wall were made in sections that could be taken down and re-used repeatedly. To facilitate the moving of the forms a gantry was built to travel on the trestle on two rails laid as far apart as possible so that the



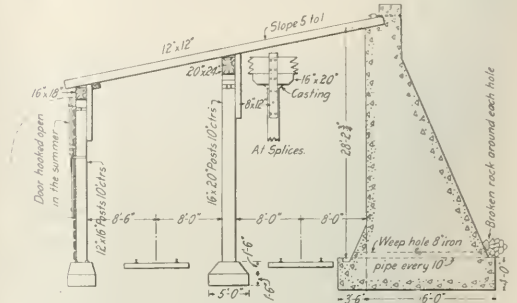
Reinforced Concrete Wall Used with Combination Sheds

concrete cars could pass underneath the gantry without interference.

THE TUNNEL WORK

Between Corea and Scenic on the lower leg of the loop 2,057 ft. of tunnel was driven through two shoulders in the hill, thereby eliminating some crooked alinement and a via-

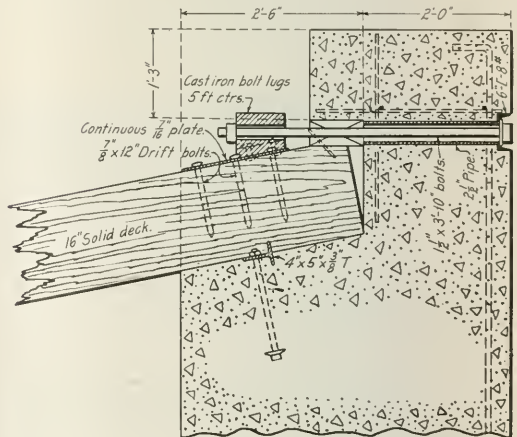
duct over a gully so situated as to constitute a serious hazard. There are really two tunnels, one each side of the gully under the bridge, there being a gap of 68 ft. in the rock, which was closed by building a single track timber shed. The tunnels were built for single track, and being



Typical Cross-Section of the Combination Shed

only partially lined with timber, can be enlarged readily to provide for double tracks during any summer season by operating trains around the old track since this involves no hazard in the summer months.

The tunnel work was conducted from six headings, one from each portal, two from the gap at the gully and two from an adit driven from the face of the hill. Several tunneling methods were used. One method was to drive a bottom heading to a full width and a height of 10 ft. and then



Details of Roof Anchorage Used on the Combination Shed

stope down the full section in four layers, two with 6-ft. holes and two with 4-ft. holes. Another method was to drive a top heading to the full arch width and later shoot down the bench. A steam-operated Marion 40 shovel was used to take out the muck, loading 4-cu. yd. Western air dump cars running on a 3-ft. 6-in. gage track. Lyner water drills were used for the heading work with jap drills for the benches. The air was supplied by two air compressors, one furnishing 1,300 cu. ft. and the other 1,700 cu. ft. of free air per minute. Steam was supplied by three boilers fired with fuel oil.

The tunnel on the upper line near Embro is 462 ft. long and has 193 ft. of arch construction at the west end and 40

ft. at the east end. The tunneling was done almost entirely by hand. A top full arch heading was driven, timbering as the work progressed, the bench being shot down later in two lifts. Drilling was all done by hand except for a small amount done with air supplied from a small compressor operated by steam from the boiler of the dinky locomotive. The muck was loaded by hand into small cars hauled by horses. For the heading 6-ft. holes were drilled that were sprung two or three times with 40-per cent. dynamite, this being also used for firing the holes.

All of the snow shed work was conducted under the general direction of A. H. Högeland, chief engineer of the Great



Interior View of the Timber Sheds

Northern, and O. S. Bowen, principal assistant engineer at Seattle. I. C. Otis was resident engineer in charge of the work west of the Cascade tunnel and G. A. Hensel was resident engineer east of the summit. The contractor for the work east of the summit was W. J. Hoy & Company, St. Paul, Minn., while west of the summit, Grant Smith & Co., of Spokane, Wash., had the contract for all of the timber sheds and the lower tunnel, while Henry & McFee, of Seattle, Wash., had the contract for the combination snow sheds and the upper tunnel.

ENGLAND'S LIMITED MAIL IN 1860.—A very interesting story is told in the September issue of the *London & North-Western Railway Gazette* by George P. Neele, the former superintendent, who is now in his 92nd year. The article in question relates to the Limited Mail and traffic by the West Coast route to and from Scotland and says that the train in question took its name from the fact that while furnished with a complete set of mail cars, fitted with apparatus for picking up and depositing letter bags en route, it was limited in the passenger accommodation to three cars only—one for Perth, one for Glasgow and one for Edinburgh. These cars were restricted to first- and second-class passengers holding single journey tickets. Those with return tickets were not, until August, 1860, allowed to use the Limited Mail. Directors with gold passes were even excluded, and any officers of the company who found it necessary to journey thereby had to book like ordinary passengers. Traffic conditions often made it necessary for appeals to be made to the Postmaster-General for permission to attach a fourth passenger car, and this concession was always readily granted on the condition that the punctuality of the train was not impaired. In 1864, however, the Post Office consented to the permanent addition of the fourth coach.

ELECTRIC TRUCKS IN STOREHOUSE SERVICE

Power trucks for hauling materials are installed to save manual effort and if the labor saved is sufficient to justify the investment in the equipment the results are considered satisfactory. However, when the installation of the trucks not only accomplishes this, but leads to a revision of other operations in the plant that bring about material economies, entirely aside from the mere hauling of material, the results become especially gratifying. This has been the case with the use of an electric storage battery truck in the general stores department of the New York Central at Collinwood (Cleveland) Ohio. It must be said in justice that the benefits gained have resulted not alone from the merits of the truck used but were derived in a measure from the skill with which the storehouse methods have been revised to secure the maximum benefit from the installation.

The truck used at Collinwood is an Elwell-Parker electric truck of the self-loading platform type; that is, the platform of the truck is supported on rocking links attached to an electric motor through worm gearing so that the platform can be raised or lowered about four inches while carrying a load of two tons. This function is utilized to good advantage in picking up loads placed on trays or skids and is one of the most important features in developing operating economies with the use of the truck.

To keep the truck moving has been the prime consideration in the Collinwood installation and in working out the details of operation to accomplish this in the largest measure, economies have been secured in the handling of the stores



Truck Carrying Basket of Packages Mounted on a Tray

materials which are entirely supplementary to the savings in labor effected in the moving of the articles from place to place. Specifically the plan provides that the truck is not standing idle during the time of loading and unloading, since a system of trays or platforms is provided on which the loading is done while the truck is otherwise engaged. The load ready, the truck comes up, its platform is rolled under the tray and then elevated to lift the tray clear of the floor. The load can then be moved to any point and the tray again lowered to a bearing on the floor. This system is by no means new, but its adaptation to the conditions imposed by storehouse operation has led to the introduction of a number of new features.

The storehouse problem includes the receipt of materials from the manufacturer or dealer in cars, the delivery of such portions of these materials to the shop as require finishing or assembling, the return of the completed or assembled

parts to the house for storage and lastly the loading of the materials from the storehouse onto cars for shipment to the division storehouses or other outlying points. Heretofore this has involved the loading of hand trucks, their manual transportation to the point of delivery and their subsequent unloading. This system has been modified materially under the new arrangement.

Suppose a car of miscellaneous material is received from the manufacturer. The electric truck delivers trays to the car where they are loaded while the truck is engaged in other service. When the loads are ready, the truck returns and carries the trays into the house, where they are unloaded for storage or are delivered to one of the shops. For instance, a tray of new air hose is taken to the fitting shop where the truck picks up another tray loaded with hose to which the fittings have been applied; or it goes to the foundry for a load of castings which are left at a lathe in the machine shop where a second tray is picked up which the lathe operator has loaded with turned castings as fast as he finished them. In these cases the loading and unloading is eliminated entirely and the machine operator or fitter ex-

second one being divided into six compartments. This has been of particular convenience in the filling of requisitions for miscellaneous articles, since the various sizes and styles can readily be kept separate and transported intact between storehouses having elevating platform trucks in operation.

The tiered trays when removed by the consignee are taken directly to the place where the particular material is stored; this has led to the elimination of regular fixed shelving to a certain extent. For example, brass fittings are made at the brass foundry at Collinwood. The practice has been to transport brass for use in the locomotive shop at Elkhart to the Elkhart storehouse. The first development of tiered trays was to load the brass at the foundry at Collinwood directly into the pockets in the tray and move the tray, entire, with the contents intact, direct to the storehouse at Elkhart. At that point the various pieces of brass were taken from the pockets in the tray and placed on shelves. It is now expected to utilize this tiered tray by simply lowering it into place at the brass section at Elkhart and avoid the handling of the brass from the tray into the stationary pockets. As the trays will be nearly empty before a new lot is received on a subsequent order, the few pieces remaining in the first tray will be tossed into the pockets containing the new shipment. This feature not only eliminates the cost of one entire handling operation but it insures (where it can be worked out) the turning over of the old material first, a very essential feature in storekeeping practice since it avoids the placing of new material upon the old.

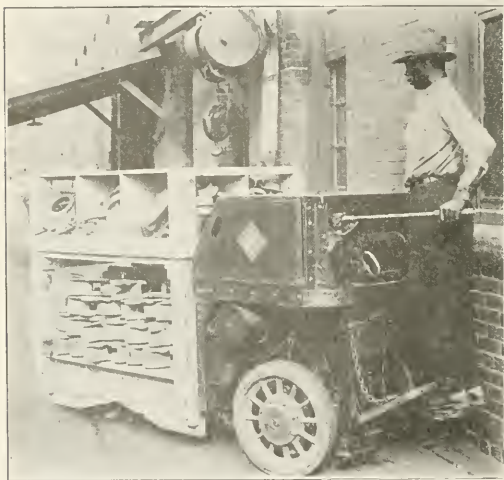
Another development in this direction is the use of metal baskets for the handling of package materials. Much of this material such as stationery is delivered from upper floors of the storehouse to the shipping floor by means of a chute, the baskets being placed on trays at the lower end of the chute to receive them.

Another class of work in which the truck has been a big help is in the handling of heavy articles, such as locomotive side rods, air compressors, etc. The gain here has been principally in the transportation of the articles since the operation of the two-wheel trucks formerly used for this heavy service frequently entailed the use of two to four men in place of the one man who now operates the truck. Here again the use of the trays is a help since they can be left within the operating radius of a crane without holding the truck until the crane is ready to remove or place the load.

The truck is 36 in. wide and 104 in. long. It steers on all four wheels and turns on a 7-ft. radius. The load pick-up platform is 26 in. wide by 54 in. long and is used with trays 36 in. by 54 in. The propelling and elevating motors both receive current from the same battery carried in an enclosed compartment on the deck over 2½-in. by 3½-in. drive wheels. The controller is immediately behind the battery and the controller drum always returns to off-position, when the handle is released. The handle may also be removed from the truck when not in use. A special interlocked circuit-breaker and controller makes it impossible to start the truck unless the driver is standing on the truck in position to operate. The brake is applied by lifting one foot. Thus if the truck is traveling at full speed and the operator jumps off the truck it will stop within its length.

The brake will hold a loaded truck on an incline and speed may be picked up on an incline with the brake partially set, making it safe to handle on grades. The truck is steered by an adjustable handle provided with a sole-leather grip and an electric bell push button in the end.

The truck is normally operated for a 10-hour day, but 12 or 13-hour service is not uncommon. The charging is done each night although more recently it has been found practicable to do the charging only on alternate nights. An automatic rheostat, manufactured by the Electric Products Company of Cleveland, has been installed for this purpose. After testing the batteries of the truck, the rheostat is set for



Using a Tiered Tray to Transport Castings

pend no more labor in handling the pieces than if they had been placed on the floor.

The loading of materials of various kinds into cars is one of the important features of storehouse operation, and while the use of the trays for delivering supplies to the cars releases the truck immediately for other uses, there still remained the work of unloading the trays. However, even this operation has been eliminated in a measure, since another truck of the elevating platform type has been placed in service at Elkhart, Ind., where one of the most important division storehouses is located. Instead of unloading the trays in cars destined for Elkhart, they are left in the cars with their loads so that the truck at Elkhart can pick them up again without the trouble of reloading.

TRAYS BUILT IN TIERS

To put this plan on a really practicable basis and to insure the loading of the car to as near its capacity as possible, it has been necessary to use something more than the simple platform tray. The needs of this situation led to the development of trays built up in tiers, as shown in the photographs. One of these shows a tray of three tiers, the

the required charge and loaded up and will shut off automatically when the truck has been charged.

The installation of the truck and the adjustment of operating methods, through which the economies secured were made possible, have been developed under the direction of the stores' department of the New York Central lines west of Buffalo.

SUGGESTIONS FOR FIRE PROTECTION OF RAILROAD PROPERTIES

For the information of the railroads the Railroads' War Board has addressed to them a bulletin containing the following recommendations of the Railway Fire Protection Association, which is composed of officers having charge of fire protection and insurance matters of the railroads:

"(1) Wherever practicable the terminals should be enclosed in close board fences, at least six feet high with at least three strands of barbed wire above and projecting outward at an angle so as to prevent scaling the fence. Some property can be fenced in whole or in part while on others it may not be practicable. There should be as few entrances as possible, preferably not more than one to each pier or unit. In the case of some buildings, such as elevators and power houses, it may be necessary to also erect individual fences.

"(2) The buildings and premises should be effectively lighted so as to make it possible to detect any one approaching from any direction. Searchlights are not generally recommended but rather devices which will flood or distribute the light.

"(3) There should be sufficient watchmen, active, honest and intelligent night men, equipped with small fire extinguishers of the one-quart type and portable clocks, to properly patrol the property. There should also be a chief night watchman or roundsman to generally check up the other men. He should also be equipped with extinguisher and clock. In case of an effective central registering system it will be unnecessary for these men to carry clocks. According to the individual properties these watchmen may be confined to the inside or may be needed both inside and outside, but in the latter case separate men should be detailed.

"(4) The watchmen should be drilled in the handling of fire protection and should be required when they come on for night duty to lay out hose and have other protection ready for instant use in case of fire. Fire alarm signal system should be tested every night.

"(5) Telephones should be installed at entrances and other points convenient for watchmen so that immediate communication can be had to all parts of the terminals. This will do away with the necessity of identification cards for parties applying for entrance. Record of parties passed should be kept.

"(6) At each entrance there should be an armed guard with government authority for identification and search of persons, entering and leaving.

"(7) A patrol on the water front by a power boat is very necessary and probably one of the best safeguards that can be adopted, but will not be advisable in all cases. A boat not less than twenty feet in length, preferably longer, equipped with searchlight and manned by at least two armed guards, should be used.

"(8) The most important protection that can be given is an efficient military guard thrown completely around property, guarding all approaches both from the water and land.

"(9) No boats should be allowed to tie up to wharves and piers at night other than those regularly docked.

"(10) Rigid instructions should be issued and enforced to prohibit smoking on or around any water front property.

"(11) It is suggested that the arrangement at terminals

be subject to the supervision and constant inspection of the insurance or fire prevention representatives of the roads."

WAR TAXES PUSH SEPTEMBER INCOME BELOW 1915 LEVEL

War taxes, which finally have taken their place among other soaring costs of railway operation, were responsible for one of the most disastrous months of the year for railway net income in September. Only in February, according to comparisons by the Bureau of Railway News & Statistics, Chicago, covering the entire operated mileage, was the loss in net income greater than in the latest month reported. Though the sixth month this year to show a loss in net income as compared with last year, September was the first month to show a loss as compared with two years ago. The month's net income was \$9,500,000 under two years ago, though the month's gross was nearly \$75,000,000 greater than in September, 1915.

For February, the Bureau's comparisons show a loss of \$23,000,000 in net income after a gain of nearly \$5,000,000 in gross. In September, after a gain in gross of nearly \$34,000,000, there was a loss in net income of \$20,000,000, within \$3,000,000 of the loss suffered in February, although the gain in traffic was nearly \$30,000,000 greater and the almost impossible winter operating conditions of February were replaced by summer. Of the former month the Commission in rejecting the plea for a 15 per cent increase said: "If the unfavorable results of February had continued our conclusions must have been different." The unfavorable results of September were due entirely to added costs of operation arising from increased wages and prices, congestion of railway facilities and above all to the totally abnormal leap in taxes.

Whereas taxes for the entire nine months have risen \$33,884,000 the increase for September alone was almost \$12,000,000,—nearly four times as great as the largest previous monthly increase in history. Total taxes for the month reached above \$26,000,000, compared with \$17,936,000 in August, the previous record. Taxes in September were at the rate of over \$316,000,000 per year, against the high record of \$180,000,000 for the year ending June 30, 1917. The marked increase is attributable to the fact that the roads in September began to figure war taxes. The September total is somewhat too high, probably, since one or two roads have charged to that month the estimated war taxes accrued for the year to the end of that month. Yet even before taxes were deducted net revenues for September were more than \$8,000,000 below last year despite a gain in gross of \$34,000,000.

How the progressive aggravation of railway operating conditions has played havoc with all improvement in traffic is best shown by the following statement giving the increases or decreases compared with last year in the various items, by months:

	Gross Revenue	Expenses	Net Revenue	Taxes	Net Income
January ..	\$43,559,000	\$34,489,000	\$9,070,000	\$1,817,000	\$7,253,000
February ..	4,912,000	26,307,000	*21,395,000	1,822,000	*23,217,000
March ...	30,519,000	37,996,000	*7,477,000	2,360,000	*9,837,000
April	41,498,000	40,509,000	989,000	2,773,000	*1,784,000
May	47,377,000	43,672,000	3,705,000	2,609,000	1,096,000
June	52,768,000	41,781,000	10,927,000	3,329,000	7,598,000
July	47,200,000	44,203,000	2,997,000	3,621,000	*624,000
August ...	39,891,000	44,857,000	*4,966,000	3,585,000	*8,551,000
September..	33,987,000	42,031,000	*9,044,000	11,968,000	*20,012,000
Total ..	\$341,651,000	\$355,845,000	*\$14,194,000	\$33,884,000	*\$48,078,000

*Decrease.

In the last line, totalling the accumulated changes of the nine months, is told the disastrous part played by soaring expenses and taxes in current railway operations. After rendering an additional service to the country measured by a gain of over \$340,000,000 in gross revenues the railways had

\$14,000,000 less remaining after meeting their added costs of material and labor. After the expansion of almost \$34,000,000 in taxes had been added to this burden they were actually worse off by \$48,000,000 than when they rendered a third-billion rollars less service.

MAKE EVERY FREIGHT CAR DO ITS BIT

By O. O. Carr.

Much has been said and done with reference to the distribution of freight cars for loading with freight for territories from which they can be loaded back again. While many conditions interfere with this plan, everything should be done to develop ways to overcome these handicaps wherever possible in order to take up the slack in distribution and conserve the car supply. A combination drop bottom box and coal car or a combination drop bottom stock and coal car will do much to overcome part of this difficulty on roads which have a number of coal mines located on their lines, as such cars can be loaded with coal to territories where they can be loaded in the opposite direction with another class of freight. The saving in empty car days and in the expense of hauling empty cars in the direction of heavy traffic, and the decrease in the cost of owning and maintaining the cars of the two classes, will show some interesting figures.

Aside from the extensive distribution of gondola cars to mines, flat cars to lumber mills, and box cars to grain elevators, the cars which are distributed under the direct supervision of the division car distributor represent only about 20 per cent of the number loaded on a division each day. A good car distributor, fully posted concerning the kind of freight loaded at each station on his division and on connecting divisions, will, as far as possible, select cars to fill orders in such a way as to supply a car that will also serve the second station's loading and thereby save the car from being moved out of that station empty.

Cars that are made empty at stations or those supplied from the yards are ordinarily loaded by the agents as best suits their convenience, which is perfectly natural since they are not familiar with the loading other stations have for cars. One has to distribute cars and to see the number hauled out of local stations empty on account of their being of a wrong class or in unfit condition to serve their loading to realize the extent to which this waste takes place. To better illustrate this slack movement, consider a few stations with the kind of cars required and the approximate destinations or territories loaded to as follows:

Stoveton—Loads stoves for stations southwest. Rough-freight box cars or those with poor-linings required.

Flourboro—Loads flour for Southport export, also local stations in Southern states. Requires extra good box cars.

Woodbury—Loads cord wood and mine props for local stations on the division. Rough-freight box, stock or gondola cars required.

Coalville—Loads coal for points north—gondola cars.

Grainfield—Loads grain for points south—good box cars.

Nurseryville—Loads nursery stock for points on foreign lines west—large box cars.

Autobon—Loads autos for various points west—auto and furniture cars.

A check of the large freight loading and distributing points where from 50 to 75 cars of merchandise and other freight are loaded each day into empties supplied from cars made empty or reshipped at the station and empties from the terminal yard will show many cases such as noted below:

A good grain car will be loaded to Stoveton when one with poor linings would have served the purpose as well, and would also have guaranteed reloading at destination.

A stock car is loaded with sewer pipe to Flourboro when a good box suitable for flour loading should have been selected.

A furniture car is loaded to Woodbury when a car of another class and in poor condition would have served the purpose.

Box cars are loaded with iron rails for the coal mines at Coalville when gondola cars should have been loaded.

A small box car is loaded to Autobon when a large car or an automobile car should have been used.

While each of the 75 cars would not be loaded wrong, there would not be as many loaded improperly if agents had something to show what the needs of all stations are. A very simple way to enable them to load cars to the best interests of the company would be to print a booklet showing the name of every local way station on the system, the freight each loads regularly, the kind of cars needed and the approximate destinations of the freight and to place these booklets in the hands of all agents, yardmasters, local conductors and shipping clerks of large industries, thereby giving them the opportunity of making a selection of cars as between stations when loading them. If cars made empty at each station received this consideration, it would be possible to work out a scheme to keep a car in continuous loading for weeks without a single empty move. The plan would automatically make a silent system car distributor of every agent, yardmaster and local conductor on the railroad.

This booklet could be revised to cover shipping seasons or supplements could be issued to make it a reliable working guide. Local stations which do not have regular daily loadings for cars could be listed as having use for, the kind of cars their next station neighbor has daily use for.

In order to secure as close adherence to the plan as possible, receiving agents could make a report showing the cars they received loaded, which had to be hauled out empty on account of having no outbound loading for cars of their class, or in the condition of the cars loaded to them. Inquiry could then be made of the loading points to ascertain whether proper consideration had been given to the selection of the cars.

Carrying out this same idea in another way, roads which have a large number of coal mines on their lines should if possible prepare a list of all coal dealers receiving coal from mines on their road, showing who have bins or unloading conditions under which coal cars with dumping appliances can be handled better and more promptly than flat bottom gondolas and likewise the names of dealers who can use flat bottom cars to better advantage. This list should be placed in the hands of the mine superintendents, who will be glad to cooperate in filling their orders by loading cars that best fit the unloading conditions of their customers, and thereby help conserve the gondola car supply.

OPERATORS OF NEW ZEALAND GOVERNMENT RAILWAYS.—According to a late report of the Minister for Railways, the total earnings of the 2,970 miles of main lines of the New Zealand Government railways amounted to \$23,363,142 for the fiscal year ended March 31, 1917, an increase of \$1,228,567 over the previous year. During the year the expenditure amounted to \$14,243,584, leaving a net profit of \$9,119,558, which represents a return of 5.3 per cent on the capital invested in these lines by the Government, which to date amounts to about \$190,000,000. There were 14,173,115 passengers carried, as compared with 14,201,506 for the previous year; and 5,826,265 tons of freight were handled, as compared with 5,960,562 tons, with 412,908 tons of live stock, as compared with 410,383 tons. The greater receipts were due to the increased passenger and freight rates charged, since the aggregate business done was less during the 1916-17 period than for 1915-16.

General News Department

A Board of Conciliation at St. Thomas, Ont., has recommended increases of 18 and 20 per cent in the pay of brakemen and baggagemen on the lines of the Michigan Central in Canada.

The Senate passed on December 11 a resolution introduced by Senator Lodge providing for an inquiry by the Senate Committee on Manufactures into the causes for the shortage of sugar and coal.

The Chicago, Burlington & Quincy has granted an increase in pay to employees in its car department, effective December 1. Those paid on a straight hourly basis were granted an advance of two cents an hour and men on piece work were given a 5 per cent increase.

Forty-two submarine chasers and other small government vessels have recently been taken through the New York State Barge Canal from Lake Erie to the Hudson River. These boats were built at western yards and have been moved to New York under their own power.

On the lines of the Southern Pacific in Texas, New Mexico and Arizona orders have been issued that all cattle and other edible animals killed upon the track shall be saved and the meat disposed of to butchers. The pelts of all killed animals must also be saved and sold.

Station employees of the New York, New Haven & Hartford have asked for an increase of 75 cents a day in their pay and for the abolition of all rates based on piece work or tonnage; also the abolition of bonuses, and the adoption of the eight-hour day and a minimum day rate of \$2.50.

The Post Office Department is advertising at Hartford, Conn., for bids, to be received until February 1, for running a postal route daily, by motor vehicle, over the highways from Hartford to New York City by way of Waterbury and Danbury, Conn., and White Plains, N. Y. The distance is 105 miles.

According to the New York Tribune, the government of Switzerland has paid \$90,000 demurrage charges on a vessel which has been held at an Atlantic port since September waiting for a load of wheat, bought in Chicago before the ship was chartered. This instance is said to be only one of many.

Miss Katherine Stinson, on Tuesday, December 11, made a flight from San Diego, Cal., to San Francisco, 610 miles, in 9 hours, 10 minutes; and without a stop. This distance is about 58 miles greater than that made by Miss Ruth Law, November 19, 1916, from Chicago, Ill., to Hornell, N. Y. Miss Stinson, in crossing the Tehachapi Mountains, rose to a height of about 9,000 ft. above the sea.

The car repair shed of the Baltimore & Ohio at Storrs Station, Cincinnati, Ohio, was destroyed by fire on November 27, together with 21 freight cars, eight of them loaded. The structure was of frame construction, 48 ft. by 445 ft., open on the sides and with three tracks running the length of the shed. The fire was discovered in the vicinity of the lockers where the men kept their tools and working clothes. Estimated loss on structure, cars, tools and supplies, \$37,000.

In the Grand Central Terminal, New York City, service flags are now displayed showing the number of employees of the New York Central lines, the New York, New Haven & Hartford, and the Grand Central Terminal who are serving in the army or the navy, a flag for each of these three organizations. The New York Central flag shows the figures 4 9 7 6 (the lines of the figures being composed of small stars), indicating the number of men representing the Central companies; the New Haven's flag reads 1 4 1 2, and the Grand Central Terminal flag 1 0 4.

The Department of Commerce has issued a statement to the effect that through the negligence of live-stock owners food animals valued at \$20,000 were killed on the tracks of the Central of Georgia during the first nine months of this year; 1,862 head, including fine dairy cows and beef cattle as well as hogs and

sheep. This is equal to one animal for every mile of track; and if that figure can be accepted as a basis for estimating the loss for the entire country, the destruction of food animals on the railway tracks of the United States during the first nine months of this year can be put at \$2,760,000, or \$3,680,000 for the whole year. The lesson is obvious.

In the dispatchers' offices of the New York Central at the Union Station, Albany, N. Y., a complete new equipment of telegraph instruments is being installed; and in connection with this improvement numerous lines are to be equipped with selector bells and lights, so that the office can be called by the selector apparatus. This arrangement, which also is in use at a number of other large offices on the New York Central, provides against tedious delays when there may be only one operator on duty. In whatever part of the office he may happen to be he can be depended on to answer promptly on any wire even though the relay or sounder of that wire is not within his hearing.

Railroads in the southern and western as well as the eastern district show decreases in operating income per mile for the month of October, 1917, as compared with October, 1916, according to a preliminary bulletin for 128 roads issued by the Interstate Commerce Commission. For the 10 months ended with October the southern roads were still ahead of 1916, while the western lines had a decrease. For October the total revenues per mile were \$1,601 as compared with \$1,429. Expenses increased from \$888 to \$1,097 and operating income fell from \$481 to \$407. For 10 months the operating income of all the roads was \$3,511 per mile as compared with \$3,780 per mile. For the eastern lines it was \$5,559 as against \$6,441; for the southern lines \$3,323 against \$3,319, and for the western lines \$2,763 against \$3,884.

One of the first questions which came to the attention of the Chicago subcommittee of the General Operating Committee of the eastern lines was why approximately 2,000 carloads of live stock are shipped monthly through the Chicago gateway to New York in preference shipments. This condition seemed strange in view of the fact that Chicago facilities for slaughtering are the best in the country. When packers were called into conference for the purpose of determining whether this traffic might not be reduced considerably to relieve the congested districts in the east, it was learned that cattle are shipped to New York City for slaughter to supply the needs of the million of orthodox Jews in that territory. The Jews, it was pointed out, are forbidden by their religion to eat meat which has been slaughtered more than 24 hours before.

Mediation and Conciliation

A controversy between the Baltimore & Ohio and its telegraph operators has been settled through the efforts of the United States Board of Mediation and Conciliation. The settlement provides for a basic eight-hour day and increased pay for overtime. The question of increased rates of pay will be submitted to arbitration.

Patriotic Duty to Reduce Freight Damages

W. J. Jackson, receiver of the Chicago & Eastern Illinois, has sent to employees a letter reminding them that all avoidable waste or damage to property constitutes actual aid to the enemy. He says: "Our loss and damage to freight is running between \$15,000 and \$20,000 per month. This is a total waste and loss. Much of it can be avoided with only reasonable care. In August last our payments included \$1,124, on account of the destruction of products of agriculture; \$1,252 for destruction of animal products; \$3,600 for the manufactured articles, etc., including a total record of food destruction of nearly \$9,000 for this one month, or at the rate of over \$100,000 per year. Surely, in fairness to our boys, our families and our country, we can do better than this! Be just a little more careful and try a little harder to avoid losses."

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF OCTOBER, 1917—Continued

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses			General.	Total.	Operating ratio.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decrease) last year.	
		Freight.	Passenger.	Total (inc. misc.).	Way and equipment.	Maintenance of structures.	Traffic.								Trans- portation.
Louisville, Henderson & St. Louis.....	200	\$140,588	\$50,072	\$202,722	\$21,440	\$30,608	\$5,182	\$3,848	\$129,464	63.86	\$73,258	\$19,900	\$53,922	\$172,758	
Maine Central.....	1,216	814,098	350,042	1,277,220	443,548	209,134	9,518	7,627	3,342,798	73.26	63,526	68,798	137,635	137,635	
Michigan Central.....	1,392	3,033,992	1,566,859	4,600,851	577,621	377,667	9,518	18,759	3,045,278	66.26	1,684,212	150,411	151,117	151,117	
Minneapolis & St. Louis.....	1,627	733,658	166,940	900,598	148,710	128,197	18,284	432,800	237,116	78.07	21,116	46,428	164,361	143,971	
Minneapolis, St. Paul & Sault Ste. Marie.....	4,228	2,649,033	560,372	3,209,405	353,498	456,336	45,543	1,241,215	58,149	2,165,715	63.03	1,270,135	164,477	1,105,612	
Missouri & North Arkansas.....	365	481,469	143,569	625,038	24,665	92,247	3,693	14,979	3,983	106,981	79.76	26,913	16,701	22,877	
Missouri, Kansas & Texas System.....	3,392	2,787,140	1,123,867	3,911,007	471,617	312,224	4,929	72,568	117,482	3,321,810	74.27	46,018	2,942	36,666	
Missouri, Oklahoma & Gulf of Texas.....	3,392	2,787,140	1,123,867	3,911,007	471,617	312,224	4,929	72,568	117,482	3,321,810	74.27	46,018	2,942	36,666	
Missouri Pacific.....	7,902	\$1,333,897	\$1,471,329	\$2,805,226	\$188,744	\$1,037,498	\$136,242	\$2,338,594	\$4,546,717	63.15	2,652,814	\$439,800	\$2,211,992	.....
Mobile & Ohio.....	1,160	1,032,277	185,417	1,217,694	155,612	333,568	43,781	426,796	31,539	956,299	76.61	292,651	65,952	225,993	
Monongahela Connecting Lines.....	1,108	173,469	185,417	358,886	22,543	30,888	4,115	31,267	4,040	41,463	69.73	6,143	6,143	40,320	
Nashville, Chattanooga & St. Louis.....	1,237	1,033,731	334,248	1,467,979	153,783	246,842	57,238	538,159	34,298	1,036,261	71.31	416,988	100,000	316,796	
Nevada Northern.....	165	219,781	171,166	390,947	28,328	18,938	1,408	49,848	10,308	109,174	44.84	134,315	10,308	123,916	
New Orleans & Northeastern.....	204	332,139	105,337	437,476	52,867	78,152	10,636	163,931	10,918	321,338	68.13	150,310	42,751	107,559	
New Orleans Great Northern.....	285	133,789	38,327	172,116	17,088	78,527	3,919	5,047	5,609	58,401	68.06	56,401	15,026	41,375	
New Orleans, Texas & Mexico.....	131	120,013	28,859	158,872	15,441	27,869	2,647	8,321	4,553	15,655	68.71	7,123	4,000	6,439	
New York Central.....	6,083	14,571,053	22,767,705	37,338,758	2,722,705	3,822,115	266,817	8,321,487	456,745	15,655,455	68.71	7,123,235	1,116,901	6,005,416	
New York, Chicago & St. Louis.....	1,998	3,635,198	3,141,767	6,776,965	989,611	1,043,034	38,275	2,010,936	19,263	5,854,627	72.05	354,831	299,725	55,106	
New York, New Haven & Hartford.....	568	564,995	89,450	654,445	143,755	103,725	10,872	3,010,936	19,263	5,854,627	72.48	2,120,041	245,000	187,475	
New York, Ontario & Western.....	1,132	2,204,399	459,331	2,663,730	460,805	316,177	1,773	155,193	5,509	241,190	61.63	54,269	50,636	42,362	
New York, Phila. & Norfolk.....	112	220,439	45,931	266,370	46,805	31,617	1,773	155,193	5,509	241,190	61.63	54,269	50,636	42,362	
New York, Susquehanna & Western.....	136	220,439	45,931	266,370	46,805	31,617	1,773	155,193	5,509	241,190	61.63	54,269	50,636	42,362	
Norfolk & Western.....	2,085	594,689	739,923	1,334,612	6,300,313	596,861	11,461,611	77,566	1,946,005	106,358	61.85	2,403,876	413,000	1,990,765	
Norfolk Southern.....	908	312,751	131,120	443,871	64,461	175,743	7,006	183,021	19,862	330,213	74.05	132,708	20,000	102,448	
Norfolk & Potomac.....	6,534	6,234,977	1,484,727	7,719,704	833,754	839,043	106,078	2,668,542	154,424	4,498,549	53.95	3,839,831	692,337	3,146,621	
Northwestern Pacific.....	700	553,397	112,433	665,830	60,798	102,004	3,066	165,435	13,138	346,940	53.16	804,859	201,160	1,010,569	
Panhandle & Santa Fe.....	709	544,814	112,433	657,247	650,899	607,98	5,066	165,435	13,138	346,940	53.16	804,859	201,160	1,010,569	
Pennsylvania Company.....	1,755	5,442,814	1,189,972	6,632,786	947,292	1,384,681	14,666	3,042,436	159,290	5,730,774	77.04	1,792,490	377,922	1,414,568	
Pennsylvania Railroad.....	4,563	16,377,980	4,801,489	21,179,469	2,683,946	4,651,888	258,338	9,678,679	570,376	18,232,455	78.64	4,946,167	927,826	4,000,339	
Pere Marquette & Western.....	100	141,913	5,519	147,432	121,132	17,603	34	59,931	3,044	1,923,755	91.33	8,806	0,500	8,306	
Piedmont & Potomac.....	337	1,637,371	384,809	2,022,180	137,245	33,550	525,301	32,972	1,235,839	61,023	1,187,193	63.61	1,000,552	107,686	892,866
Piedmont, Baltimore & Washington.....	1,755	5,442,814	1,189,972	6,632,786	947,292	1,384,681	14,666	3,042,436	159,290	5,730,774	77.04	1,792,490	377,922	1,414,568	
Pittsburgh & Lake Erie.....	735	212,513	203,023	415,536	266,811	406,850	14,407	711,390	38,683	1,443,918	57.04	1,097,657	209,460	878,057	
Pittsburgh & West Virginia.....	2,399	4,602,232	1,266,790	5,869,022	729,304	1,391,595	174,043	2,541,047	145,913	5,031,421	77.10	1,404,701	263,596	1,140,105	
Pittsburgh, Cinetti, Chic. & St. Louis.....	88	187,535	210,518	398,053	146,455	146,455	16,468	54,925	10,315	188,774	35.52	188,774	30,520	158,254	
Potomac, Fredericksburg & Potomac.....	418	220,439	45,931	266,370	46,805	31,617	1,773	155,193	5,509	241,190	61.63	54,269	50,636	42,362	
Rio Grande.....	2,399	4,602,232	1,266,790	5,869,022	729,304	1,391,595	174,043	2,541,047	145,913	5,031,421	77.10	1,404,701	263,596	1,140,105	
St. Joseph & Grand Island.....	538	205,416	94,139	309,555	21,411	34,720	3,028	34,938	8,982	261,242	88.22	39,558	11,333	28,225	
St. Louis, Brownsville & Mexico.....	548	205,416	94,139	309,555	55,044	43,264	9,757	88,476	9,614	206,089	63.35	119,332	8,000	111,332	
St. Louis, Merchants' Bridge Terminal.....	9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Louis, San Francisco.....	4,752	3,635,841	1,480,066	5,115,907	501,301	301,252	42,808	22,700	1,628,282	79.61	2,606,089	11,363	69,377	15,695	
Seaboard.....	3,461	1,774,516	819,721	2,594,237	280,116	285,860	61,808	1,032,007	130,136	3,375,168	62.39	2,034,297	221,550	1,811,993	
Southern.....	6,083	5,798,018	2,147,997	7,946,015	1,043,034	989,611	38,275	2,010,936	19,263	5,854,627	72.48	2,120,041	245,000	187,475	
Southern in Mississippi.....	278	78,781	41,187	120,968	23,735	13,244	2,237	3,584	4,160	65,538	61.81	3,470,390	383,518	3,104,188	
Southern Pacific.....	7,103	9,739,018	3,124,558	12,863,576	1,333,666	2,375,131	2,537	3,033,844	4,160	9,575,738	61.46	3,479,817	9,000	2,574,817	
Spokane, Portland & Seattle.....	555	428,421	138,482	566,903	66,229	46,094	8,254	166,285	15,570	306,421	49.23	315,945	58,300	257,631	
Tennessee Central.....	282	138,482	37,775	176,257	21,025	23,854	4,900	61,356	6,417	112,642	68.63	53,649	48,439	3,833	
Terminal R. of Association of St. Louis, Texarkana & Fort Smith.....	87	75,161	15,343	90,504	29,967	58,908	2,978	30,185	3,565	19,575	62.63	14,031	49,631	35,600	
Texas & Pacific.....	468	406,105	148,300	554,405	39,323	75,470	8,825	188,585	11,897	333,800	56.13	267,596	46,743	217,974	
Texas & Pacific.....	1,947	2,324,916	646,765	2,971,681	189,225	280,405	38,208	803,100	75,373	1,405,980	63.70	800,860	125,900	675,251	
Toledo & Ohio Central.....	1,947	2,324,916	646,765	2,971,681	189,225	280,405	38,208	803,100	75,373	1,405,980	63.70	800,860	125,900	675,251	
Toledo, St. Louis & Western.....	455	595,067	34,465	629,532	82,760	116,007	20,665	193,967	10,738	440,955	66.35	317,113	46,100	171,013	
Trinity & Brazos Valley.....	3,622	6,948,763	1,467,157	8,415,920	1,099,331	752,883	106,988	2,132,967	178,127	4,316,585	53.33	3,792,766	541,600	3,251,023	
Union R. of Penna.....	35	116,632	49,030	165,662	16,127	121,146	.....	298,657	7,380	534,500	101.16	6,293	3,517	2,776
Union R. R. of Ohio.....	35	116,632	49,030	165,662	16,127	121,146	.....	298,657	7,380	534,500	101.16	6,293	3,517	2,776
Vicksburg, Shreveport & Pacific.....	171	151,515	64,504	216,019	22,560	36,480	8,645	38,208	6,672	140,147	58.18	100,242	28,100	72,044	
Virginian.....	2,510	2,944,588	693,348	3,637,936	390,117	519,631	79,779	1,520,903	79,761	2,615,874	68.30	1,214,543	161,338	1,053,565	
Walsh.....	356	278,512	135,552	414,064	248,066	153,333	12,642	354,457	4,758	125,860	50.75	122,177	13,415	109,761	
West Jersey & Seashore.....	359	278,512	135,552	414,064	248,066	153,333	12,642	354,457	4,758	125,860	50.75	122,177	13,415	109,761	
Western Maryland.....	697	1,059,601	96,174	1,155,775	138,211	231,302	21,492	214,882	28,400	60,406	68.04	304,352	49,000	255,352	
Western Pacific.....	933	1,070,765	125,755	1,196,520	120,404	108,974	20,404	156,767	13,746	260,479	72.52	32,532	26,609	33,933	
Western & Lake Erie.....	512	1,058,896	48,673	1,107,569	175,971	125,001	15,733	371,079	31,933	752,604	64.25	476,344	87,307	389,037	
Yazoo & Mississippi Valley.....	1,382	1,381,603	365,156	1,746,759	227,742	233,779	33,279	540,949	38,292	1,104,458	60.00	736,377	119,401	617,365	

REVENUES AND EXPENSES OF RAILWAYS

TEN MONTHS CALENDAR YEAR 1917

Average mileage operated during period.	Name of road.	Operating revenues			Operating expenses			Net railway operation.	Operating income (or loss).	Increase (or decrease) comp. with last year.	
		Freight.	Passenger.	Total. (inc. misc.)	Traffic.	Trans- portation.	General.				
143	Alabama & Vicksburg.	\$1,152,864	\$415,319	\$1,721,149	\$30,954	\$584,545	\$623,518	\$1,218,582	71.73	\$866,567	\$73,317
142	Alabama & Western.	1,380,376	582,603	1,962,979	165,408	1,195,744	1,166,640	3,893,272	68.33	1,631,817	104,708
137	Arizona Eastern.	1,195,744	1,195,744	2,391,488	1,931,207	3,829,322	2,661,312	7,368,230	62.34	3,727,369	245,665
8,644	Atlanta, Topeka & Santa Fe.	81,875,210	25,162,324	116,998,569	19,316,735	19,316,735	13,432,422	32,750,157	62.34	83,262,667	70,520
993	Atchafalaya & West Point.	239,256	527,152	1,432,938	64,944	479,956	50,203	997,748	69.63	337,778	70,520
64	Atlanta, Birmingham & Atlantic.	2,453,975	545,546	3,248,563	154,091	1,425,577	107,108	2,071,553	83.16	139,000	6,994
167	Atlantic & St. Lawrence.	1,032,285	248,369	1,462,195	40,480	328,444	43,778	1,092,555	83.16	461,369	81,294
479	Baltimore & Annapolis.	2,637,140	9,276,126	35,689,893	6,678	1,073,016	68,897	1,922,565	69.01	1,906,810	374,726
479	B. & O. Chicago Terminal.	1,216,101	5,176,525	31,762,325	9,648	1,598,363	1,268	8,278,465	69.01	1,101,338	194,400
688	Baltimore, Chesapeake & Atlantic.	683,478	3,189,165	6,778,292	14,427	570,469	26,636	945,316	86.79	143,489	118,878
632	Bangor & Aroostook.	2,797,405	792,448	3,699,792	41,324	1,133,433	121,759	4,359,886	66.74	1,230,806	187,500
268	Bessemer & Lake Erie.	9,978,191	327,902	10,513,587	118,792	2,338,522	215,678	7,122,014	67.39	3,315,752	882,440
2,035	Birmingham & Nashville.	2,614,098	48,878	2,704,287	12,084	393,168	35,777	1,052,647	38.93	1,651,639	288,352
52	Boston & Maine.	2,167,896	1,216,101	3,383,997	32,574	1,598,363	1,176,298	3,383,265	71.64	1,105,692	173,466
2,305	Buffalo & Susq. R. R. Corp.	1,755,194	60,799	1,461,891	225,978	459,541	63,494	1,179,370	80.67	282,520	212,515
587	Buffalo, Rochester & Pittsburgh.	10,628,290	1,088,150	12,466,881	179,405	4,734,129	289,319	973,239	79.10	2,710,142	356,000
234	Canadian Pacific lines in Maine.	1,352,572	2,963,133	1,993,210	58,744	893,621	51,450	1,688,212	84.70	304,998	87,000
18	Carolina, Cincinnati & Ohio of S. C.	157,116	215,357	3,384,595	16,885	79,489	10,927	1,698,254	57.28	1,440,544	134,000
1,619	Central of Georgia.	816,984	3,264,332	12,763,566	49,708	4,210,720	410,391	31,360,436	71.54	97,713,538	1,601,476
684	Central of New Jersey.	22,712,601	5,751,654	31,073,858	313,882	12,512,778	665,337	21,360,331	68.74	9,733,538	8,065,941
301	Central New England.	4,944,559	298,780	4,581,252	12,460	1,623,036	90,384	3,953,249	64.51	1,676,002	184,400
341	Chesapeake & Ohio.	1,514,125	781,005	2,195,130	12,460	1,623,036	90,384	3,953,249	64.51	1,676,002	184,400
1,074	Chesapeake & Ohio.	3,556,506	6,362,306	44,728,311	591,416	15,018,931	38,366	1,121,953	67.28	68,220	75,500
2,953	Chicago & Alton.	1,976,583	4,024,084	17,721,101	1,863,181	6,043,030	339,405	11,722,957	70.89	9,909,044	567,935
1,051	Chicago & Eastern Illinois.	13,243,931	2,834,387	17,456,428	1,863,888	4,337,638	277,434	13,507,599	77.56	3,575,838	3,676,719
1,370	Chicago & Erie.	6,219,417	491,873	7,307,523	196,573	6,567,912	408,819	13,507,599	77.56	3,575,838	3,676,719
8,76	Chicago & Northwestern.	7,211,896	20,352,614	89,922,176	1,145,540	33,560,829	1,932,308	63,124,703	72.59	24,657,471	4,600,000
927	Chicago & Rock Island.	1,156,599	1,018,083	11,144,228	14,796,981	3,861,488	32,558	68,812,572	74.99	35,761,091	1,294,401
721	Chicago, Detroit & Canada.	1,156,599	1,018,083	11,144,228	14,796,981	3,861,488	32,558	68,812,572	74.99	35,761,091	1,294,401
1,496	Chicago, Detroit & Canada.	1,156,599	1,018,083	11,144,228	14,796,981	3,861,488	32,558	68,812,572	74.99	35,761,091	1,294,401
5,209	Chicago, Indianapolis & Louisville.	1,213,434	3,192,133	13,592,625	1,894,332	2,329,658	461,062	5,719,134	76.51	1,393,409	574,675
1,796	Chicago, Indianapolis & Louisville.	1,213,434	3,192,133	13,592,625	1,894,332	2,329,658	461,062	5,719,134	76.51	1,393,409	574,675
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* Resources shown are for period June 1 to October 31

Railway Regiments' Tobacco Fund

Two more supply companies have made contributions to the Railway Regiments' Tobacco Fund since last week. They are as follows:

Marion Malleable Iron Works, Marion, Ind. \$10 a month
Rodger Ballast Car Company, Chicago. \$10 a month

The Machinery Club of New York City at its last board meeting approved a resolution that appropriated one-third the profits of the cigar department for the month of December for soldiers' smokes. One-half of this amount will be sent to the New York Sun Tobacco Fund and the other half to the Railway Regiments' Tobacco Fund.

Railway Officers in Military Service

In the *Railway Age Gazette* of November 23, page 933, there was published a list of railroad officers sent to Russia to assist in the operation of the Russian railways. By an oversight there was omitted from this list the name of T. H. Lantry, assistant to the vice-president of the Northern Pacific, who is one of the officers of the Russian Railway Service Corps with the rank of lieutenant colonel.

Limitation of Use of Official and Private Cars

The Railroads' War Board, through Fairfax Harrison, its chairman, has addressed to the railroads a bulletin expressing its opinion that the use of official and private passenger cars should be limited in order to relieve overburdened passenger trains. It is suggested that "no such cars be handled, either in free or pay service, except for the accommodation of railroad officers when traveling on necessary railroad business."

Pennsylvania to Sell War Savings Stamps

The Pennsylvania Railroad has completed arrangements for placing on sale the new war savings stamps and thrift stamps at ticket offices and in its shops, freight stations and in the various departments on the Lines East and West of Pittsburgh.

Every ticket agent on the entire system, except those in the immediate vicinity of a post-office, will have the stamps for sale.

As in the case of the campaign for the two Liberty Loans, special efforts will be made to encourage investment in the savings and thrift stamps on the part of employees. It having been found impracticable to place the stamps on sale directly in the pay cars, arrangements will be made wherever possible to have them on sale near the pay cars when employees are being paid.

Japanese Occupy Vladivostok Terminal

According to press despatches, authentic information was received at Washington, Tuesday night, that Japanese troops have occupied the great railroad works at Vladivostok, the Pacific terminal of the Trans-Siberian Railway.

The railroad works which the Japanese have occupied have been the place where all the imported railroad cars and locomotives shipped from the United States and purchased under the Russian credit in this country have been assembled. There are also at Vladivostok great supplies of other kinds of stores, including ammunition. The possession of the railway yards and the railway equipment at the Vladivostok terminals will make it absolutely impossible for the Bolshevik Government to move these cars and stores without the consent of the Entente powers.

Valuation Arguments Presented Before I. C. C.

Arguments in support of the protests of the Texas Midland, the Atlanta, Birmingham & Atlantic and the Winston-Salem southbound against the tentative valuations of their property made by the Bureau of Valuation of the Interstate Commerce Commission were presented before the full membership of the commission at Washington beginning on Monday, December 10, by Pierce Butler and W. G. Brantley, counsel for the roads. Arguments were also made on behalf of the state railway commissions by Charles E. Elmquist, on behalf of the railway brotherhoods by Glen E. Plumb, and on behalf of the Bureau of Valuation by Solicitor P. J. Farrell. The arguments of the railroad counsel followed the briefs they had previously filed, one of 1027 pages in the case of the Texas Midland and one of 737 pages in the case of the Atlanta, Birmingham & Atlantic.

Pierce Butler and Leslie Craven also filed a special reply in the form of notes and comments upon the memorandum recently filed by Director Prouty in the Texas Midland case, with a note stating that it had not been submitted to or considered by the Presidents' Conference Committee and was not filed in its behalf. A similar note was appended to the briefs.

Government Operation of Railways Imminent

The following facts were received by wire from Washington after the first part of this issue containing the article on "Government Operation of Railways Imminent," page 1073, was printed.

Legislative agents of the four railway brotherhoods went to Washington Wednesday at the request of Daniel Willard and conferred with the President after he had seen the railway officers. Representative Sims, the next chairman of the House Committee on Interstate Commerce, also conferred with the President.

The statement is made near the bottom of the second column on page 1075 that 100 locomotives have been ordered from the western to the eastern lines. The Western lines arranged to furnish these locomotives at the request of the War Board at a recent meeting in Chicago at which a pro rata plan for providing them was decided upon. They will be delivered to various Eastern lines at convenient junction points and will be furnished as follows: By the Santa Fe, nine; Northwestern, seven; Burlington, seven; Great Western, one; Chicago, Milwaukee & St. Paul, eight; Rock Island, six; Chicago, St. Paul, Minneapolis & Omaha, two; Duluth & Iron Range, ten; Duluth, Missabe & Northern, twelve; Great Northern, five; Illinois Central, six; Kansas City Southern, one; Minneapolis & St. Louis, one; Minneapolis, St. Paul & Sault Ste. Marie, two; Missouri, Kansas & Texas, two; Missouri Pacific, four; Northern Pacific, five; St. Louis-San Francisco, three; Cotton Belt, one; Southern Pacific, six; Union Pacific, four.

North Western Provides Free Recreation Rooms at Chicago for Soldiers

The Chicago & North Western will soon open spacious club rooms in its Chicago passenger station where soldiers and sailors may make themselves at home while in the city. The new club rooms will be on the street level and will be supplied with comfortable chairs, settees, couches, writing desks and stationery, books, newspapers and magazines, victrolas and pianos, shower and porcelain-tub baths, sanitary bubbling drinking fountains, toilet rooms, wash stands and towels. The Chicago & North Western will also establish an information bureau in charge of a secretary. At this bureau a register will be maintained for the interchange of information between the enlisted men and the public regarding entertainment at homes for weekends and meals, for the registration of gifts, including tickets for entertainments, and interchange of the donors' and receivers' names. Various societies in Chicago, co-operating with the railroad, have undertaken to provide suitable and frequent entertainments in the club rooms. The use of all these comforts is free to the enlisted men of the army and navy.

Report of Board of Mediation and Conciliation

The Federal Board of Mediation and Conciliation reports that during its life of four years interruption of interstate railway service by labor disputes has been almost negligible. The law does not require the board to make annually or otherwise an official report, but in view of the extreme gravity of the present railway situation a special report has been sent to the President.

In four and a half years there has been a total of 84 disputes, which threatened all classes of employees, but in less than half a dozen instances has there been cessation of train movement. In these cases the disputes broke out suddenly, before the board knew they were impending, and in each case a settlement was effected quickly. In no instance has a strike followed the intervention of the board.

Fifty-seven cases have been settled by mediation. Seven have been solved by combined mediation and arbitration, eight by arbitration, one by congressional action, three by the parties themselves, three are under arbitration, four in mediation and one remains unsettled.

Agreements effected by mediation have been found to be more

satisfactory to all sides. There is no decision against either party and neither of them suffers defeat.

"The present law," says the report, "may not be adequate for dealing with controversies of nation-wide extent, or even those which affect large sections of the country under abnormal conditions, but it seems to be the best plan yet devised. . . ."

The Halifax Catastrophe

In the disastrous explosion of a shipload of munitions in the harbor of Halifax, N. S., on Thursday, December 6, in which twelve hundred or more persons were killed and the city was devastated over a territory of 2½ square miles, the railroads suffered severely. The central passenger station was wrecked, and in it many lives were lost. Practically all buildings in the freight yards were demolished, and about 400 freight cars were destroyed, many of them being burned in the fires which followed the explosion. One statement says that, for a distance of two miles, freight cars were lifted off the track and thrown into the ditches or the adjacent fields. Seventy or more passenger cars were badly damaged. At the Richmond station every employee was killed and many were killed and injured in the freight yards. Of 70 trainmen making their headquarters at that station, only 10 had reported for duty on the Monday morning following the disaster.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meetings of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

- AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.
- AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, Supt. Timber Preservation, B. & O. Mt. Royal Sta., Baltimore, Md. Next convention, January 22-24, 1918, Hotel Sherman, Chicago.
- CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.
- CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.
- CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Morrison Hotel, Chicago.
- CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.
- CINCINNATI RAILWAY CLUB.—H. Buet, Chief Interchange Inspector, Cin. Ry., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.
- ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 568 Union Arcade Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.
- GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.
- NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.
- NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.
- Niagara Frontier Car Men's Association.—Geo. A. J. Hochgrebe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month. New York Telephone Bldg., Buffalo, N. Y.
- PACIFIC RAILWAY CLUB.—N. V. Walker, Assistant to Chief Engineer, Northwestern Pacific R. R., San Francisco, Cal.
- PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.
- RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial Annex Hotel, Pittsburgh.
- St. Louis Railway Club.—E. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.
- SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. I. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.
- TRAFFIC CLUB OF CHICAGO.—C. B. Sinsler, La Salle Hotel, Chicago.
- TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.
- WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.
- WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.
- WESTERN SOCIETY OF ENGINEERS.—Edgar S. Nethercut, Secretary, 1735 Monmouth Bldg., Chicago, Ill. Regular meeting, first Monday in month, except January, July and August. Extra meetings generally on other Monday evening except in July and August.

Traffic News

The Pennsylvania Lines West will establish the sailing day plan of handling 1. c. 1. freight at Cincinnati on January 2, and at Pittsburgh some time in the same month.

According to the Altoona Tribune, express trains of 26 cars are now to be seen on the Pennsylvania Railroad. However, these are not sleeping cars or coaches; they are filled with the Adams Express Company's merchandise.

The cotton crop of this year is now estimated at 10,949,000 bales, smaller than the crop in any other year since 1909. The present estimate is more than a million bales below that made by the Department of Agriculture in October. Prices are now higher than before for many years.

The Transportation Committee of the National Lumber Manufacturers' Association, at a meeting held in Chicago, has adopted resolutions calling on the railroads' war board to prohibit the reconsignment of cars put in transit unsold, after such cars have arrived at the original billed destination.

The quantity of vegetables raised in Florida for the northern market this year is said to have been 26,000 carloads, or about 9,000 carloads more than last year; and the growers say that the lack of railroad facilities is now hampering them seriously. It takes eight days, or twice the normal length of time, to get freight from Florida to New York.

The Chamber of Commerce of Hartford, Conn., has an improvised clearing house to economize the work of automobile trucks. A Hartford manufacturer, sending a truckload of freight to Willimantic, 32 miles, got in touch with the secretary of the Chamber of Commerce and through arrangements then made, the truck driver, on arriving at Willimantic, was informed by telephone where a return load of freight could be found.

One of the greatest difficulties confronting shippers and railroad officers alike during the last year and a half has been an everchanging multiplicity of embargoes. L. J. Brinkman, general agent of the operating department of the Michigan Central at Detroit, Mich., has simplified his embargo problem by issuing every day a concise mimeographed statement indicating which roads are open or closed to c. l. and l. c. 1. freight from Detroit, with a brief summary of exceptions on each road. The statement also includes a summary of general embargoes and a list of embargoes against industries on the Michigan Central.

At a recent conference in St. Louis, Mo., with representatives of the Missouri and Illinois Fuel Administrations and the St. Louis Fuel Committee representatives of the railroads and coal operators agreed to a plan for limiting the reconsignment of coal and providing for confiscation of coal by the United States Fuel Administration under certain conditions. Under the plan agreed to, unless a bill of lading showing the final destination of coal is received at either the St. Louis or East St. Louis yards before a car arrives, the coal may be taken over by the Fuel Administration and reconsigned to points where it is most needed.

The Chicago, Burlington & Quincy recently issued a list of "don'ts" and "dos" for shippers for the purpose of preventing congestion during the winter months. The circular reads in part as follows: "Don't fail to consult agent before offering shipments for embargoed territory. Ascertain from agent before placing order for car if the route you wish to use is open. Don't ship via indirect lines to avoid embargoed routes, as it has the effect of plugging up quickly the only avenue the railroads have for relieving congestion. Don't think we want you to do it all. We are endeavoring to do our bit. Let us know if we have overlooked anything."

H. C. Bixler, superintendent of stations and transfers of the Pennsylvania Railroad, announces that at a conference of railroad men and shippers, an agreement has been reached for the use of standard containers for fruits and vegetables shipped by freight, the shippers being represented in the conference by the Fruit & Vegetable Transportation Association of the South and East. At this conference, held in New York City last Tuesday,

about 150 persons were in attendance, including representatives of the Department of Agriculture and of the New York City Government, steamship men and makers of boxes, crates and barrels. To insure satisfactory transportation and to avoid losses and waste, the Fruit & Vegetable Transportation Association has been working for some time toward the adoption of standard containers for each kind of vegetable; and at this conference a large number of sample boxes and crates were exhibited. Fourteen types were approved and recommended for adoption by all shippers of perishable freight. Among the designs approved are a lettuce crate, an orange box, a celery crate, two kinds of crates for cantaloupes, and numerous others. For each design there is a specification, naming every bit of material and prescribing every process of manufacture.

New Elevator at Erie

Overcoming the greatest difficulties in obtaining materials and labor the Pennsylvania Railroad has finished its new grain elevator at Erie, Pa., in time to render material assistance in moving the final grain shipments from the northwest, before the closing of navigation. The new elevator, a steel and concrete structure, replaces the old wooden plant which was destroyed in two successive fires. The first cargo, which has just been elevated and transferred to cars, consisted of 101,000 bushels of wheat from the steamer John Owen. It will be shipped abroad from Philadelphia. The lake trip to Erie is considerably shorter than to Buffalo, and may enable some steamers to make one more round trip, prior to the coming of heavy ice. The new elevator consists of 30 reinforced circular tanks, 18 interstice tanks and 22 side and pocket bins, having a total capacity of 1,156,400 bushels. It has track room for more than 150 cars, and is capable of unloading grain at the rate of 25,000 bushels an hour. The plant is complete in all respects, including powerful car pulling machinery for placing cars, and is absolutely fireproof. All machinery is operated electrically, and electric lights are used throughout.

Reductions in Passenger Service

The Pennsylvania has discontinued the express train leaving Pittsburgh, Pa., for New York City at 1 p. m.; and beginning with next week will discontinue, between New York and Washington, all of the through sleeping cars to and from points in the southern states, except on two trains. It is said that these withdrawals of sleeping cars will be equivalent to three full trains. The southward trains on which sleepers will continue are those leaving New York at 9:30 p. m., and midnight (12:30 a. m.). The Southern Railway express, leaving New York at 11:08 a. m., will be taken off, as will four northbound expresses; those leaving Washington at 7:30 a. m., 9:05 a. m. (two sections) and 11:15 a. m. The Florida Limited and the Florida Special, winter resort trains, will not be run north of Washington this winter. The foregoing changes aggregate about 3,000 passenger-train miles daily.

The Pennsylvania Railroad advises that there is no foundation for the report as circulated by the press that the company proposes to discontinue any of its regular two-hour express trains between Philadelphia and New York, or that it has reached an agreement with the Philadelphia & Reading to divide the passenger business between those two cities, either in equal shares or in any other manner.

The demand for transportation between New York City and Philadelphia, over the Pennsylvania, exceeds the capacity of the trains now operated and as a large proportion of this traffic is for business purposes of the highest importance—much of it relating to the conduct of the war—the question of curtailing the service presents a very difficult problem.

Livestock Shipments Regulated

Beginning Monday, December 10, all shipments of live stock into the Chicago market will be stabilized in accordance with a plan recently suggested by the Railroads' War Board. This plan, which also tends to stabilize prices, was adopted at a conference of representatives of the Chicago Car Service Committee of the Railroads' War Board, the Federal Food Administration, growers and shippers of livestock, commission men and the packing interests.

Under the old plan, which allowed unrestricted shipments of livestock, heavy consignments of cattle would arrive in Chicago

on one or two days of the week and light consignments during the remainder. To avoid all the undesirable results of this custom, what is called the zone system of regulating shipments was evolved and will govern all shipments on and after December 10.

Under this plan, within a zone of approximately 300 miles of Chicago, livestock will be received for shipment to reach the Chicago market only on Tuesday, Thursday, Friday or Saturday. Within the second zone, beyond 300 miles from Chicago and up to the 36-hour limit for shipments of live stock, shipments will be received to reach the Chicago market on Monday, Wednesday, Friday or Saturday. The third zone embraces all territory outside of the 36-hour limit from Chicago and from this zone shipments of live stock may be made at any time to reach the Chicago market on any week day.

It is probable that this system of stabilizing shipments and prices of live stock will be extended with necessary modifications to all the big live stock markets of the country.

New York State Waterways

Governor Charles S. Whitman, of New York, speaking before the Atlantic Deeper Waterways Association, at Miami, Fla., November 29, presented arguments in favor of deepening the Hudson River, between New York and Albany, so that ocean vessels could sail to Albany and thus relieve the congestion in New York harbor. He said that ample land, conveniently situated, could be made into a terminal, near Albany, where freight could be transferred from canal boats to larger vessels and vice versa. The governor said that the foreign commerce passing through Albany by rail amounts to more than 14,000,000 tons yearly. The completion of the new barge canal, next spring, should increase this volume of freight. The Hudson River is deep enough already for ocean-going vessels from New York up to a point about 40 miles south of Albany. The governor thinks that motor trucks will make the barge canal available to many shippers who, without them, could not expect to share in its benefits.

Representatives of the New York State Waterways Association propose to call upon the National Council of Defense for an appropriation of \$5,000,000 for the construction of barges for service on the new canal next year. This appropriation is urged as a military necessity and as "a means of benefiting the entire nation."

The Chamber of Commerce, at its regular monthly meeting in New York City, December 6, adopted resolutions requesting the governor of New York to direct the proper state officers to take the steps necessary, including co-operation with the appropriate Federal Department, to provide suitable and sufficient equipment to enable the barge canal and other waterways to be made use of to the fullest possible extent. On Monday, December 10, about 300 men, representing the Federal and State governments and commercial interests, met at the Chamber of Commerce, endorsed the resolutions which had been passed, and listened to addresses on the prospects of the canal and the need of additional transportation by General W. W. Wotherspoon, superintendent of Public Works of the State of New York, and Major-General William W. Black, chief of engineers of the United States Army. General Black said that many corporations were building barges for the transportation of freight on the Mississippi, Missouri and the Ohio rivers. He regarded the Erie Canal as of the highest importance in developing the powers and resources of the country for the winning of the war. He does not believe in government ownership of transportation lines.

Facilitating Export Freight

The export division (sitting at New York) of the eastern carriers' operative committee now has authority over the issuance of railroad shipping permits embracing all commodities for export via Boston, New York, Philadelphia, Baltimore, Norfolk and Newport News, excepting United States Government freight. This extension of authority was put in effect on December 12. In connection with this centralization of export permits at New York, the general operating committee (Pittsburgh) ordered that all lines reaching North Atlantic seaboard ports embargo at once all export freight through those ports, except for the United States Government, and that any existing permits be canceled. This drastic action is declared to be vitally essential, and the committee calls for thorough co-operation in the handling of traffic for overseas shipment, so that cars which would otherwise be available for fuel, foodstuffs and Government

freight shall not be used in moving traffic which cannot be promptly re-shipped when it reaches tidewater.

In an endeavor to enlist the aid of the commercial steamship lines, Chairman George D. Ogden, of the export division, has asked the Trans-Atlantic Associated Freight Conference and the steamship committee of the New York Produce Exchange to co-operate in relieving the congestion at the seaboard. He requests that in contracting cargo they give marked preference to the traffic now at the seaboard, rather than to book new business from the interior. He also asks for help in cases where cargo booked for specific sailing fails to arrive in time, thus involving a second engagement. "In event it were practicable for the steamship lines, in such instances, to create a co-operative plan for the purpose of turning such belated shipments to other steamship lines that might have available space for the same foreign destination," much relief would be accomplished.

Notes on the Coal Situation

More coal was forwarded from ports of the great lakes up to December 2 than during the entire season of 1916. It was estimated that 26,000,000 tons of coal would be required this year by consumers, but that estimate has now been exceeded by 1,072,290 tons, or 1,446,020 tons more than the total lake shipments of coal last season. Also, the Northwest has received, all-rail, from the fields of Illinois and Indiana this year nearly three times as much coal as last year.

Fuel Administrator Garfield has approved plans of the Coal Shippers' Terminal Pool Association for establishing terminal coal pools in the central west to facilitate handling of the coal supply. The plan contemplates uniform pooling arrangements under the Central Executive and Advisory Committee of the pool association wherever pools are established with the approval of the Fuel Administration.

Shipments of anthracite coal in November amounted to 6,545,313 tons, or about a half million tons more than in November of last year. For the 11 months ending with November the total shipments aggregated 71,434,360 tons, or 4,057,990 tons greater than the total shipments for the 12 months last year. To date this year the shipments exceed those of the same period in 1916 by 9,640,743 tons.

The pool committee, which represents coal operators in the central territory, will meet at Cleveland on Friday with F. C. Baird, who has been authorized to represent the General Operating Committee of the Eastern Railroads. Mr. Baird has also been designated to act as the official representative of the Fuel Administration in clearing up the congestion of coal shipments on the Chesapeake & Ohio, which has delayed the coal supply of Michigan and other central western points. He will combine the authority to control the transportation conditions with the authority conferred by Mr. Garfield in order to effectively deal with the emergency.

According to the weekly report of the Geological Survey for the week ending December 8, the total production of bituminous coal was 10,273,014 net tons, a decrease of 10.8 per cent, as compared with the production of the preceding week. Shipments of anthracite as reported by the nine principal carriers decreased 12.8 per cent. For the week ending November 24 lack of cars was responsible for 20.2 per cent of the deficiency from full time operation and, the report says, inadequate transportation facilities thus remain overwhelmingly the dominant factor limiting the output of soft coal.

Governor James H. Cox went over the heads of Federal Fuel Administration officials on December 12, and took the Ohio coal shortage problem in his own hands. His first move was to order solid train loads of coal assembled and sent immediately to points in the state most seriously in need of fuel. The order was directly contrary to instructions of F. C. Baird, Federal Fuel Administrator in charge of the lakes coal pool. Cleveland, who refused by long-distance telephone Wednesday to sanction such action. Subsequently word came that Mr. Baird had decided to send a representative to Columbus in accordance with the Governor's wish to keep in close touch with the distribution. He said by telephone that he would co-operate with the state. The changed attitude of the Fuel Administration representative, it is believed, will work to practically a complete distribution of all lakes coal, which means that no fewer than 5,000 cars in Ohio and more than 10,000 cars held in Kentucky, near Cincinnati, will be moving to consumers without further delay.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

Express Companies Ask Higher Rates

Representatives of the principal express companies testified before the Interstate Commerce Commission on December 7 in support of their application for a general 10 per cent increase in express rates on interstate traffic. It was announced that they proposed to ask the state commissions for a similar increase if their application is granted by the federal commission. T. B. Harrison, counsel for the express companies, stated that since the Interstate Commerce Commission allowed an increase on September 1, 1915, the expenses of the express companies had increased much faster than their revenues, but that the increases during the present year have been abnormal. In addition to the general rise in prices for labor and materials, Mr. Harrison said that the increase in expenses was largely due to the abnormal increase in traffic, and results from overloaded equipment, congestion of terminals, and the shortage of equipment caused by the use of so many express cars for military traffic, which has made it necessary for them to use box cars on some of the eastern roads in place of express cars. He also spoke of the large increase in the amount of loss and damage claims due to congestion, poor packing by the shippers, shortage of labor, and especially to the increased value of the commodities transported. As a result, he said, it has come about that the operating receipts of the express companies are less than enough to pay their expenses. If an increase is allowed and the abnormal conditions shall change, the companies will be willing to co-operate with the commission in reducing the rates.

J. H. Henderson, counsel of the Iowa Railroad Commission, appeared as chairman of a committee representing various western state railroad commissions. Hugh La Master, counsel of the Nebraska Commission, and a member of this committee, said the state commissions would desire an opportunity to examine the exhibits of the express companies before announcing their position, but that the American Express Company had charged the cost of the retirement of a large building in New York to expenses and had charged it to only four years' operations, making the annual charge more than the amount of the deficit. He thought the charge should have been made to surplus.

J. W. Newlean, vice-president of Wells, Fargo & Co., introduced an exhibit giving the composite statements of the Adams, American, Southern and Wells Fargo companies, which showed that for the seven months ending July 31, 1917, while the revenues from domestic express transportation were \$115,662,604, as compared with \$96,083,108 in the corresponding period of 1916, the operating expenses had increased from \$43,411,080 to \$56,261,522. Taxes had also increased, with the result that whereas the operating income in the corresponding seven months of 1916 was \$3,675,694, or 3.82 per cent of the gross receipts, in 1917 there was a deficit of \$508,527, or .44 per cent of the gross receipts. The exhibit contained numerous financial statements and also a table showing an increase in wages during the period from August, 1916, to October, 1917, equivalent to over \$6,000,000 a year. Another exhibit gave a detailed statement of the increases in the prices paid for articles of supply and equipment essential to express operations.

The Interstate Commerce Commission has announced a further hearing on the application of the express companies for increases in rates, at Washington, on December 18.

STATE COMMISSIONS

The Public Service Commission of New York, Second district, has been appealed to by the railroads to stiffen its rules for the marking of packages or loose pieces of l. c. l. freight; and a hearing is to be held at Albany December 18. They ask for the revocation of the orders of the Commission issued in 1908, so that carriers may demand that each package be marked with the name and address of the consignor. The present rule prescribes that only two packages in a shipment need be fully marked.

COURT NEWS

State Statute as to Handholds—Contributory Negligence

The Circuit Court of Appeals, Sixth Circuit, holds that under Gen. Code, Ohio, Sec. 8951, forbidding common carriers to move a locomotive not provided with grabirons or handholds in the sides and ends thereof, a railroad company is guilty of negligence where it operated an engine on the pilot of which a turtleback or iron bar had been placed, which rendered it impossible to use the handholds. The suit was one for injury to a track repairer, who, for the purpose of riding to dinner at the railroad's camp, attempted to step on the footboard on the pilot end of the engine, which was moving, tender foremost, at a speed of 8 to 12 miles an hour and hauling six empty cars; he missed either his footing or his handhold, fell under the cars, and lost a leg. Under the Ohio statute contributory negligence does not bar recovery where that is slight and the employer's negligence great. The questions whether the railroad employee's negligence was slight as compared with that of the company, as well as the comparative degrees of negligence, were held jury questions. There was evidence that the employees were warned not to board moving trains, but that their superiors acquiesced in their doing so. It was held that the plaintiff, in violating a mere warning, which did not amount to a prohibition, was guilty of only contributory negligence, and judgment for the defendant was reversed and a new trial ordered because of an instruction to the jury that might have led them to believe that recovery was absolutely barred because of such verbal warnings.—Heskett v. Pennsylvania, 245 Fed. 326. Decided October 2, 1917.

Recent Decisions Under the Federal Employees' Liability Act

The Illinois Supreme Court holds that a carpenter employed by an interstate and intrastate railroad in building forms on the margins of a right of way into which concrete was to be poured to form retaining walls for concrete for the elevation of the tracks, injured by sawdust flying into his eye, was not engaged in interstate commerce.—Dickinson v. Industrial Board (Ill.), 117 N. E., 438.

The North Carolina Supreme Court holds that an employee who, on the specific orders of the foreman, was carrying cross-ties to a repair track used by the railroad in interstate commerce, and which track was to be used by a waiting train immediately on being repaired, was engaged in interstate commerce.—Cherry v. Atlantic Coast Line (N. Car.), 93 S. E., 783.

Cars billed from another state were placed in the yards at the place to which they were billed. The Kentucky Court of Appeals holds that a member of the switching crew was not engaged in interstate commerce when injured the next day after their arrival while changing them to another track, solely for convenience in taking them to another place in the state.—Louisville & Nashville v. Meadors (Ky.), 197 S. W., 440.

The Michigan Supreme Court holds that a servant employed to provide coal and water for locomotives and to aid in moving them about the yards while on their way from Ohio to Michigan or from Michigan to Ohio was employed in interstate commerce, though sometimes the engines came in from one state at night and did not go out until the next morning. Gay v. Cincinnati Northern (Mich.), 164 N. W., 454.

The federal district court, N. D. Dakota, holds that an employee of an interstate railway company engaged in operating a pumping station furnishing water indiscriminately and contemporaneously to locomotives engaged in interstate and intrastate commerce is within the act.—Roush v. B. & O., 243 Fed., 712.

The Circuit Court of Appeals, Sixth Circuit, holds that an employee engaged in repairing a bridge used by an interstate carrier on its main line is engaged in interstate commerce.—Cincinnati, N. O., & T. P., 243 Fed., 76.

The North Carolina Supreme Court holds that a crossing flagman required to give signals to an interstate train and injured while assisting the engineer in its operation over the crossing is engaged in interstate commerce within the act.—West v. Atlantic Coast Line (N. Car.), 93 S. E., 479.

The New York Supreme Court, Trial Term, Saratoga County, holds that a brakeman injured while assisting in staking an empty freight car out on a siding in New York City for attachment to an interstate train, the car being billed to a foreign railroad's terminal in New York was injured in interstate commerce within the act; his train having come from Vermont to New York.—Daley v. Boston & Maine, 166 N. Y. Supp., 840.

Equipment and Supplies

LOCOMOTIVES

THE AMERICAN & FOREIGN SALES CORPORATION, Munsey building, Washington, D. C., advises that it desires to buy 2 second-hand standard gauge locomotives, weighing 35 or 40 tons and in good running condition.

RUSSIAN GOVERNMENT. According to reports, the orders outstanding for cars and locomotives placed last May on behalf of the Russian Government have not been canceled, but work on them has been held up. The orders outstanding call for about 500 large locomotives and 10,000 four-wheel freight cars. The orders for 1,500 locomotives and 30,000 cars which were in contemplation and which were distributed in October and November were not definitely signed and no work has been done on them.

FREIGHT CARS

THE NATIONAL TUBE COMPANY is inquiring for 30 50-ton ore cars.

J. S. MULLEN, Kansas City, Mo., is inquiring for 8 to 10 tank cars.

THE BALTIMORE & OHIO is inquiring for 2 to 10 8,000 to 10,000-gal. tank cars.

J. EDWARD CRUSEL, New Orleans, La., is inquiring for 30 to 50 8,000-gal. to 10,000-gal. tank cars.

THE UNITED STATES ARMY has ordered one spreader car from the Central Locomotive & Car Works.

THE ESSEX TERMINAL RAILWAY has ordered 50 gondola cars from the Canadian Car & Foundry Company.

THE VIRGINIA-CAROLINA RAILWAY has ordered 8 80-ton flat cars from the Central Locomotive & Car Works.

THE LOUISVILLE & NASHVILLE has ordered 300 steel underframes from the Western Steel Car & Foundry Company.

THE FLORA AMERICAN PLYWOOD COMPANY, Macon, Ga., has ordered 20 flat cars from the Central Locomotive & Car Works.

THE AMERICAN SMELTING & REFINING COMPANY is inquiring for 30 20 to 30-ton steel hopper cars and 30 30-ton dump cars.

THE VULCAN STEEL PRODUCTS COMPANY, New York is inquiring for prices on 100 flat, 150 box and 70 stock cars for South America.

THE GLEN NINA TANK LINE, N. M. Pierce, owner, Buffalo, N. Y., has ordered 50 8,000-gal. capacity tank cars from the Pennsylvania Tank Car Company.

IRON AND STEEL

THE GREAT NORTHERN has ordered 1138 tons of steel from the American Bridge Company for the renewal of 160 inner pockets at ore dock No. 3, Allouez, Wis.

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered 2 77-ft. 8-in. deck plate girders from the American Bridge Company for a bridge at Romeo, Tex., 110 tons.

SIGNALING

THE INTERURBAN RAILWAY has ordered from the Union Switch & Signal Company materials for automatic block signals on three pieces of single track on its line between Des Moines, Iowa, and Camp Dodge.

THE SOUTHERN RAILWAY has awarded to the General Railway Signal Company a contract for the construction and installation of automatic block signals between Charlotte, N. C., and Spartanburg, S. C., 76 miles, double track. With the completion of this work, the Southern will be equipped with automatic block signals from Washington, D. C., to Atlanta, Ga., 649 miles; and alternat ing current is used throughout.

Supply Trade News

H. G. Doran & Co., Chicago, has been appointed agent for the Rivet Cutting Gun Company, Cincinnati, Ohio.

Henry Gaul, a forging machine expert connected for many years with the Ajax Manufacturing Company, Cleveland, Ohio, died recently.

The Union Railway Equipment Company, Chicago, has purchased the exclusive rights to manufacture and sell the Bourell brine valve or retainer formerly handled by the Western Sales Company, Chicago.

G. A. Schneider, formerly of the San Francisco sales organization of the Western Electric Company, has been appointed manager at the Buffalo house, succeeding J. W. Tabb, who has been transferred to New York.

New Glidden Company Formed

One of the most important transactions in the annals of the paint and varnish trade of this country has just been concluded by the outright purchase of the Glidden Varnish Company, of

Cleveland, Ohio, and its subsidiary, the Glidden Varnish Company, Ltd., of Toronto, Canada, by a newly formed corporation headed by Adrian D. Joyce, who was until recently director and general manager of sales and distribution of the Sherwin-Williams Company. The new company will be known as the Glidden Company, and is capitalized at \$2,500,000, fully paid in.

Associated with Mr. Joyce are O. A. Hasse, formerly manager of paint and varnish sales for the Sherwin-Williams Company, and R. H. Horsburgh, controller of the same company. They will vice-president and secretary-treasurer, respectively, in the new corporation. All three have resigned their connections with the Sherwin-Williams Company, and it is positively stated that the new company is not in any way connected with other paint and varnish interests.

Members of the Glidden family, including F. A. Glidden, heretofore president of the company, will retire from the new corporation, but the balance of the organization will remain intact and will be enlarged as necessity demands.

The present Glidden plant, occupying nearly 17 acres, is a model in completeness of equipment and modern arrangement.

With present extension plans completed the company will be the largest varnish plant in the country.

The Glidden Varnish Company has been in business nearly 50 years. Railroad and steamship companies are among the largest Glidden customers. Many large Government contracts will be executed by the new company.

Adrian D. Joyce has been 20 years in the paint and varnish business, mostly with the Sherwin-Williams Company. He was

for several years a traveling salesman, later special representative for the Industrial Trade, then sales manager of the Kansas City district and finally assistant sales manager of the company in Cleveland. He was then advanced to general manager of sales and distribution. He has had a broad sales and executive experience, and had charge of all sales and warehouse direction. He has been closely identified with national and international affairs in the paint and varnish trade, and is experienced in manufacturing. He has paid particular attention to raw materials and studied specially the new uses of paint and varnish materials. He was a director of the Sherwin-Williams Company.

O. A. Hasse's entire experience has been in the paint and varnish business. He started in the advertising department, then served as secretary and finally was transferred to sales department in charge of sales, serving consecutively in the following departments: insecticides, insulating varnish, railroad, street railroad and marine finishes, also general manufacturing sales, and then for several years he was manager of paint and varnish sales. He has had experience as a traveling salesman, and is familiar with the sales and manufacturing problems, having had at one time entire charge of the development of railway sales. He has also made a deep study of raw materials.

R. H. Horsburgh was with the Sherwin-Williams Company for 18 years, starting as office boy and working up to controller. In this latter position he was in charge of credits, accounts, taxes and insurance. He was in close touch with the financing of the company, was a credit specialist and has spent his entire career in this industry.

E. M. Baylies, eastern manager of the P. & M. Company at New York, has been appointed general sales agent with offices at 30 Church street, New York, and Railway Exchange building Chicago. He was born at Des Moines, Iowa, on March 14, 1878. After graduating from high school he was for two years with the Metropolitan West Side Elevated, Chicago, as a student apprentice, following which he was with the Rockford & Interurban as assistant to the general manager. He was later associated with the Aluminum Company of America as assistant sales agent at Chicago, and on December 1, 1914, was elected eastern manager of the P. & M. Company. He has been a stockholder and director of the P. & M. Company, since its organization.



R. H. Horsburgh



A. D. Joyce

ler of the same company. They will vice-president and secretary-treasurer, corporation. All three have resigned



O. A. Hasse



E. M. Baylies

A. A. Strom, vice-president of the Pettibone-Mulliken Company and president of the U. S. Ball Bearing Company, whose death was mentioned in these columns, on December 9, was born in Sweden in 1855. He came to this country at the age of 14 and worked in the foundries of N. S. Bouton & Co. at Chicago. He started a small forge shop in Chicago in 1880 with P. A. Godey, at first working at the forge himself. The business increased rapidly and in 1885 it was incorporated under the name of the Strom Manufacturing Company. This business was later incorporated with Pettibone-Mulliken Company, with which Mr. Strom had been associated ever since. At his death he was a director and vice-president of that corporation and also president of the U. S. Ball Bearing Manufacturing Company.



A. A. Strom

TRADE PUBLICATIONS

MILLING CUTTERS.—The Cleveland Milling Machine Company, Cleveland, Ohio, is issuing a stock list of milling cutters on the fifteenth of each month. In this stock list each type of milling cutter is illustrated and the number of each size and quality of material which are available for immediate shipment are tabulated. Copies will be furnished on request.

A. G. A. GRADE CROSSING SIGNALS.—This is the title of a pamphlet of 20 pages, illustrated in colors, which has been issued by the A. G. A. Railway Light & Signal Company, Elizabeth, N. J., to describe its flashlight signal for highway grade crossings. Detailed illustrations and descriptions are given of the signal, including the construction of the flashing apparatus, together with illustrations of the acetylene containers; also a view of a crossing at Richland, N. J., protected both by the A. G. A. light and by gates.

HOISTING MACHINERY FOR INDUSTRIAL WORKS.—Under this title the Shepard Electric Crane & Hoist Company, Montour Falls, N. Y., has issued a loose-leaf catalogue bound in a heavy manila cover. The catalogue refers in detail to the construction and specifications for the Shepard hoists, gives a complete outline of the terms and conditions of purchase, including prices and discounts. It gives all the information necessary for selecting and specifying the various types and sizes of hoists. Clearance drawings for each type are given.

UNIVERSAL VERTICAL AND HORIZONTAL BORER.—The Oliver Machinery Company, Grand Rapids, Mich., has issued a four-page folder containing illustrations and specifications of its No. 74 Universal vertical and horizontal wood boring machine. This machine has a single spindle each in the horizontal and vertical positions, which have a capacity of boring holes up to three inches in diameter. The folder also contains illustrations of the Oliver "Little Pattern Makers," which are boring machine cutting tools for use in profiling and core box work, fillet cutting, etc., operations which the pattern maker is often compelled to do by hand.

"HYDRO" PRESSURE AND DRAFT RECORDERS.—Catalogue "D" of the Bacharach Industrial Instrument Company, Pittsburgh, Pa., is an eight-page pamphlet in which is described in detail the design and construction of the "Hydro" recording instruments. The moving element of these recorders is a ball floating in water, to which is attached a recording pen. The position of the pen is determined by the differential pressure between the inside and outside of the bell. The instruments are made in several types, both recording and indicating, for a variety of uses where draft vacuum, low pressures and differential gas pressures are to be measured.

Financial and Construction

FINANCIAL NEWS

COLORADO, KANSAS & OKLAHOMA.—This 51-mile road, operating between Scott City, Kan., and Winona, is to be sold for junk at Scott City on December 15.

MINNEAPOLIS & ST. LOUIS.—Newman Erb, who for several years following the death of Edwin Hawley was president of this company but who subsequently resigned as both a director and president, has been elected a director again.

NEW YORK, NEW HAVEN & HARTFORD.—Eli Whitney has resigned as a director.

SOUTHWESTERN RAILWAY.—A. C. Parks announces that he was appointed receiver of this company on November 12 by the United States District Court for the Northern District of Texas. The road extends from Henrietta, Tex., to Archer City, a distance of 29 miles.

UTAH RAILWAY.—This company began operation under its own management on November 30, on which date its contract with the Denver & Rio Grande expired.

RAILWAY CONSTRUCTION

COLUMBIA RAILWAY & NAVIGATION COMPANY (ELECTRIC).—Surveys have been made for an electric line to be built from Columbia, S. C., west to Greenwood, 76 miles. On account of unsettled business conditions construction work is indefinitely postponed. F. H. Haskell, chief engineer, Columbia.

ELECTRIC SHORT LINE.—Surveys are being made for a line to be built from Hutchinson, Minn., to Lake Lillian, 25 miles. R. C. Jones, traffic manager, Minneapolis, Minn.

ILLINOIS CENTRAL.—This company has purchased property on the west side of its right of way at Fifty-third street (Hyde Park), Chicago, upon which it plans to construct a new passenger station.

INTERNATIONAL RAILWAY (ELECTRIC).—A contract has been given to the Buffalo Dredging Company to build an electric line from Buffalo, N. Y., to Niagara Falls, 16.5 miles.

MISSOURI, KANSAS & TEXAS OF TEXAS.—This company has awarded a contract to the List & Gifford Construction Company, Kansas City, Mo., for the elimination of three grade crossings and the improvement of three under grade crossings at Dallas, Tex. The work involves the use of 55,000 lb. of steel, 5,400 cu. yd. of concrete, the excavation of 50,000 cu. yd. of earth and the construction of a fill of 135,000 cu. yd. The cost of the work is estimated at \$350,000.

USE WOOD INSTEAD OF COAL.—To help meet the shortage of 50,000,000 tons in the country's coal supply the Fuel Administration, in co-operation with the Department of Agriculture, has inaugurated an intensive campaign for the substitution of wood for coal. "One cord of hard wood is equal to a ton of coal," said an announcement by the Fuel Administration. "One ton of coal is released for use in war work for every cord of wood substituted. Statistics show that there is a vast amount of dead wood in many sections of the country and that the supply of wood in many communities is sufficient for domestic purposes in those parts." Much of the wood in communities is destroyed as waste, it was pointed out, and its conservation not only would conserve coal, but would prove a measure of economy to the users. New England and the South, the statement said, have an abundance of wood and in the latter section activities already are under way looking to an intensive campaign for the substitution of wood. In this connection it was announced that the Department of Agriculture would provide the services of expert foresters without charge to supervise the cutting of wood so that no damage would be done to growing timber and that the largest use might be obtained of the wood supply.

ANNUAL REPORT

SEABOARD AIR LINE RAILWAY COMPANY

REPORT OF THE DIRECTORS FOR THE FISCAL YEAR ENDED
DECEMBER 31, 1916.

PORTSMOUTH, VA., OCTOBER 18th, 1917.

To the Stockholders of the Seaboard Air Line Railway Company:

The Board of Directors submits the following report of the operations of your properties for the year ended December 31, 1916:

The Interstate Commerce Commission issued an Order on November 24, 1916, requiring railway companies to furnish Annual Reports of their operations for the calendar year instead of the former fiscal year ending June 30th, the first report to be made as of December 31, 1916. In order that the Annual Report of this Company shall cover the same period, this report is submitted for the twelve months period ended December 31, 1916, and future annual reports will be made for the calendar year, which now becomes the fiscal year, instead of the fiscal year ending June 30th.

INCOME ACCOUNT

FOR YEAR ENDED DECEMBER 31, 1916, COMPARED WITH YEAR ENDED
DECEMBER 31, 1915.

	1916	1915	Increase
Gross Revenue	\$26,184,487.25	\$22,640,876.44	\$3,543,610.81
Operating Expenses and Taxes	18,742,598.01	16,605,976.09	2,136,621.92
Net Operating Revenue (after Taxes)	7,441,889.24	6,034,900.35	1,406,988.89
Uncollectible Railway Revenue	12,890.34	8,223.22	4,667.12
Operating Income	7,428,998.90	6,026,677.13	1,402,321.77
Other Income	460,431.79	403,106.39	57,325.40
Gross Income	7,889,430.69	6,429,783.52	1,459,647.17
Rents and Other Charges	210,135.81	245,035.27	34,899.46†
Hire of Equipment	143,991.87	(Cr.) 3,674.57	147,666.44
Applicable to Interest	7,535,303.01	6,188,422.82	1,346,880.19
Fixed Interest Charges	4,673,392.39	4,383,620.97	289,771.42
Balance	2,862,010.62	1,804,801.85	1,057,208.77
Full 5% Interest on Adjustment (Income) Bonds	1,250,000.00	1,250,000.00	
Net Income	\$1,612,010.62	\$554,801.85	\$1,057,208.77

†Decrease.

The Gross Revenue increased 15.65 per cent. Operating Expenses increased 13.15 per cent. Taxes increased 8.94 per cent. Operating Income increased 23.27 per cent. Operating Expenses, exclusive of Taxes, were 66.96 per cent. of the Gross Revenue, as compared with 68.44 per cent. of the previous year; and including Taxes, 71.58 per cent. of Gross Revenue as compared with 73.35 per cent. for the preceding year.

MILEAGE OPERATED.

The mileage of the Seaboard Air Line Railway Company in operation on December 31, 1915, was	3,449.29
Extension constructed during the year	10.00
Less spur tracks taken up	.37
Additional trackage acquired during the year	2.58
Less trackage discontinued	.16
Mileage in operation December 31, 1916	3,461.34
Made up as follows:	

MILEAGE OWNED.

The owned mileage of the Seaboard Air Line Railway Company on December 31, 1915, was	3,373.57
Extension constructed during the year	10.00
Less spur tracks taken up	.37
Mileage owned December 31, 1916	3,383.20

LEASED LINES.

Meldrim, Ga., to Lyons, Ga.	\$7.65
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TRACKAGE.

Howells, Ga., to Terminal Station, Atlanta, Ga.	2.58
Howells, Ga., to Freight Depot, Atlanta, Ga.	2.84
Hilton, N. C., to Navassa, N. C.	2.40
At Birmingham, Ala.	.07
Freight Yard Jet, Birmingham, Ala., to Birmingham, Ala.	14.88
At Bessemer, Ala.	.16
Near Mulberry, Fla.	1.46
	82.04
	3,465.24

DEDUCT.

Amelia Beach branch, leased to City of Fernandina, Fla.	2.00
Silver Springs, Fla., branch, leased to Ocklawaha Valley Railroad Company	1.90
	3.90

Total mileage operated December 31, 1916	3,461.34
Average miles of road operated during the year	3,451.54
Average miles of road operated shows an increase over previous year, of	1.26%
Sidings (including 23.94 miles on Leased Lines and Trackage)	948.00

SECOND TRACK.

Between Raleigh, N. C., and Cary, N. C.	7.59
Hamlet, N. C., Northwardly	9.61
At Atlanta, Ga.	2.30
At Birmingham, Ala.	3.05
At Tampa, Fla.	1.32
Total	23.87

CHANGES IN OPERATED MILEAGE.

An extension to the Company's lines in Florida, known as the "Kissimmee Valley Ten Mile Extension" was built eastwardly from the end of the Lake Wales line	10.00 Miles.
Trackage rights acquired over the Southern Railway from Howells, Ga., into the Terminal Station at Atlanta, Ga.	2.58 Miles.
	12.58 Miles.

Spur tracks at Dunnellon, Fla., removed during the year.	.37
Trackage discontinued over the Western and Atlantic Railroad from Freight Depot to Union Station at Atlanta, Ga.	.16
	.53 Miles.

Net Increase 12.05 Miles.

In addition to the above, a spur about one mile long, near Mulberry, Fla., known as the "Christina Spur" has been practically completed. The Operated Second Track Mileage has been increased during the year by acquiring Trackage Rights over 2.30 miles of track owned by the Southern Railway at Atlanta, Ga.

FUNDED DEBT.

Of the \$3,184,500 First and Consolidated Mortgage, Series "A," Six Per Cent. treasury bonds as of June 30, 1916, \$2,750,000 were sold, of which \$2,062,000 were delivered up to December 31, 1916, leaving \$688,000 for later delivery.

\$2,306,000 Seaboard Air Line Railway Refunding Mortgage Four Per Cent. Bonds were during the year refunded under the provisions of the First and Consolidated Mortgage by the issue in exchange of \$1,700,000 First and Consolidated Mortgage, Series "A," Six Per Cent. Bonds; the bonds so refunded were deposited with the Trustee of the First and Consolidated Mortgage as provided in said Mortgage.

The total amount of First and Consolidated Mortgage, Series "A," Six Per Cent. Bonds outstanding in the hands of the public on December 31, 1916, was \$26,221,500.

The \$285,000 outstanding Seaboard and Roanoke Railroad Company Registered Six Per Cent. Certificates of Indebtedness maturing August 1, 1916, were refunded at maturity by the issue of First and Consolidated Mortgage, Series "A," Six Per Cent. Bonds in accordance with the provisions of the First and Consolidated Mortgage. The holders of the Seaboard and Roanoke Certificates were paid in cash and the First and Consolidated Mortgage Bonds received in this transaction were placed in the Treasury of the Company.

There were redeemed and cancelled during the year \$53,000 Florida Central & Peninsular Railroad Company Land Grant Extension Five Per Cent. Bonds, including \$5,060 of these bonds mentioned in the last annual report. For further details of the Funded Debt, see Table No. 4.

EQUIPMENT.

An equipment agreement, Series "R," was entered into on July 1st, 1916, for the purchase of

- 5 Mountain Type Passenger Locomotives.
- 2 Gas Electric Motor Cars.
- 15 All-steel Express Cars.
- 3 All-steel Dining Cars.
- 4 All-steel Observation Dining Cars.
- 50 Steel Under and Upper Frame Caboose Cars.

Under said agreement the cash payment of \$99,890.45 was represented by a deferred certificate which was received into the treasury of the Company and pledged under its First and Consolidated Mortgage in accordance with the provisions thereof, and the remainder of the purchase price was represented by Equipment Trust obligations aggregating \$510,000, bearing interest at the rate of 4½% per annum, payable in twenty semi-annual installments of \$25,000 and \$26,000, alternating on the first day of January and the first day of July in each year, commencing January 1, 1917, and ending July 1, 1926.

Of this equipment there was received during the fiscal year:

- 15 All-steel Express Cars
- In addition to the equipment named above, the following were purchased and placed in service during the year:
- 3 Ballast Spreaders
- 6 Air Dump Cars.

MAINTENANCE OF WAY AND STRUCTURES.

ROADWAY TRACK AND STRUCTURES.

Roadway, track and structures of the company have been properly maintained at a cost of \$3,187,544.10, which represents an expenditure per mile of \$923.51.

SIDE TRACKS.

42.16 miles of new sidings and extensions of existing sidings were constructed, and there were deducted by removal and changes of old sidings, 8.77 miles, making a net increase over previous year of 33.39 miles.

There were also constructed 2.40 miles of new sidings on leased lines, and there was deducted by removal .24 mile, making a net increase of 2.16 miles over previous year.

TIE RENEWALS.

Tie renewals were 1,632,264 cross ties and 1085 sets of switch ties, and the cost, \$749,604.76, was charged to Operating Expenses.

RAIL.

89.95 miles of new 85-lb. and 20.24 miles of new 90-lb. steel rail, making a total of 109.19 miles, were laid in the main line, replacing therefrom lighter worn rail. There was charged net to Operating Expenses therefor, \$126,024.56, and to Capital Account \$132,680.03.

In addition, 45.51 miles of released 68, 75 and 85-lb. steel rail were laid on branch lines, 70-lb. and lighter rail, and there was charged to Operating Expenses therefor, \$18,987.36, and to Capital Account, \$47,568.14.

BALLAST.

226,990 cubic yards of gravel and slag ballast were put under main line track during the year, and of the total cost thereof, \$357,861.97 was charged to Capital Account.

TRESTLES FILLED.

2,442 lineal feet of wooden trestles were filled in during the year and of the total cost thereof, including culverts, \$15,008.40, was charged to Operating Expenses.

TRESTLES REBUILT AND BALLAST DECKED.

There were built during the year out of creosoted timber 4,695 lineal feet of ballast decked trestles, replacing old open deck trestles, and of the total cost thereof, \$60,503.35, was charged to Operating Expenses.

BRIDGES.

Work has been done on five bridges, providing fenders, replacing with steel or concrete, or strengthening them for heavy traffic.

Four of these bridges were authorized during the year and all of them have been completed, the principal one being a reinforced concrete highway overpass, A. feet by 111 feet, at Hlanding Street, Columbia, S. C.

The total cost of the above bridge work during the year was \$22,581.94, of which \$19,720.73 was charged to Capital Account and \$2,861.71 to Operating Expenses.

In addition to the above, work is now in progress replacing the structures destroyed by the high water of July, 1916. This work will be completed during the coming year and consists of the following:

Catawba River, near Mount Holly, N. C., three through truss spans, each 165 feet long, and one deck girder span 50 feet long.

Catawba River, near Van Wyck, S. C., four through truss spans, each 147 feet long.

Waterlee River, near Camden, S. C., one through truss span 260 feet long.

Also, the above does not include the new Strauss Bascule lift bridge and the two new deck girder spans at Hilton Bridge, near Wilmington, N. C., which have been completed.

This bridge, as mentioned in previous report, is owned by the Wilmington Railway Bridge Company, which Company is owned and operated jointly by the Seaboard Air Line Railway Company and the Atlantic Coast Line Railroad Company.

RAIL IN MAIN LINE.

The total operated main line single track mileage of the system, 3,461.34 miles, is laid with steel rails of the following weights:

Miles.	Weight.
0.50	91 lb. rail.
53.87	90 " "
53.61	85 " "
97.42	80 " "
1,220.20	75 " "
256.48	70 " "
200.03	68 " "
18.87	65 " "
60.48	63.5 " "
3.95	60 " "
557.20	58 " "
215.40	56 " "
260.33	and lighter.

Total 3,461.34

The above does not include:

SECOND TRACK.

Raleigh, N. C., to Cary, N. C.: 7.59 Miles	85 lb. rail.
Northward from Hamlet, N. C.: 9.09 Miles	90 " "
52 "	75 " "
At Atlanta, Ga.: 2.30 Miles	85 " "
At Birmingham, Ala.: 1.43 Miles	75 " "
1.62 "	60 " "
At Tampa, Fla.: 1.32 Miles	75 " "

LINE OWNED BUT NOT OPERATED—LEASED.

Silver Springs Branch: 1.20 Miles	60 lb. rail.
70 "	56 " "
Amelia Beach Branch: 2.00 Miles	50 " "

MAINTENANCE OF EQUIPMENT.

The equipment of the Company was fully maintained during the year at a cost of \$3,909,973.00.

Included in the cost of maintenance is \$71,183.65, representing value of equipment destroyed or retired from service during the year and credited to the cost of equipment.

There was also included in the Cost of Maintenance \$435,649.96 for depreciation which was credited to Reserve for Accrued Depreciation.

The cost of maintenance per unit of equipment owned is as follows:

Average cost per annum per Locomotive owned.....\$2,642.25

Average cost per annum per Passenger car owned.....758.40

Average cost per annum per Freight car owned.....63.21

The extension from Charleston, S. C., to Savannah, Ga., mentioned in Annual Report for year ended June 30, 1916, is still in process of construction, but will be completed during 1917. This will provide two distinct and separate main lines between Hamlet, N. C., and Savannah, Ga., both serving different thriving sections. The completion of this line, in extension and the grade revision between Hamlet and Charleston, now in progress, will give a line with a maximum five-tenths percent compensated grade and a maximum curvature of three degrees between Hamlet, N. C., and Jacksonville, Fla., with the exception of three curves of four degrees. The new portion of the line from Charleston to Savannah will have a maximum three-tenths percent grade and two degree curves, and will effect a large saving in handling traffic between Hamlet and Savannah, as it will allow an increase of 127.5 percent in tonnage per train as compared with the tonnage which can be handled via the present Columbia route.

The grade revision which is now in progress between Hamlet, N. C., and Charleston, S. C., will be completed during the coming year and, as noted above, will give a maximum five-tenths percent grade line in both directions over these points.

During the year work has been completed between Raleigh, N. C., and Sanford, N. C., correcting the short and irregular grades in this line, thus facilitating train operation through this district and making a large saving in operating costs. Grade revision work is now in progress on certain sections of the line between Sanford, N. C., and Hamlet, N. C., which will eliminate two rusher grades, and provide a five-tenths percent grade against Northbound traffic and an eight-tenths percent grade against the train loading, and equalize the drawbar pull, thereby facilitating operation and reducing hazard and making a saving in operating cost. This grade revision work between Raleigh and Sanford and between Sanford and Hamlet is all located on one engine district.

A modern fireproof machine and erecting shop and blacksmith shop have been completed during the year at Portsmouth, Va., to replace buildings destroyed by fire. In addition, there has been provided a new power and house, fuel shop, engine, carpenter and paint shop, two wash and locker rooms, and one engine drop pit. A 50,000 gallon steel water tank was built in connection with the present fire protection facilities. New and modern machinery has been provided for the additional facilities including heavier power cranes for handling locomotives.

New shop facilities and additions to present facilities to serve both the Car and Locomotive Departments are now under construction at Howell, Ga. These facilities will be completed during the coming year. The additional facilities at Raleigh, N. C., and Hamlet, N. C., mentioned in previous report, have been practically completed and are now in operation.

New facilities for the Mechanical Department are also in course of construction at Andrews, S. C.

The coach shop at Jacksonville, Fla., has been completed by the addition of a concrete transfer table. New machinery has also been installed, thus providing modern facilities for repairing coaches at the south end of the Company's line. The use of these facilities for heavy repairs to passenger coaches at this point will avoid the long haul which was formerly made in moving the cars to Portsmouth.

Team tracks and paved driveways have been practically completed on the additional property which has been acquired during the year at Plant City, Fla. This provides facilities to care for a large and increasing business at this point, and also gives an additional frontage of 420 feet on adjacent property owned by outside parties and suitable for industrial locations.

The joint industrial track with the Central of Georgia Railway at Savannah, Ga., mentioned in the Annual Report for year ended June 30, 1916, has been completed. This track serves the cotton storage warehouses of the Savannah Warehouse and Compress Company, and also affords opportunity for other large industrial development.

An important industrial track has been constructed at Timmonsville, S. C., to serve the present and future development located off the Company's Right of Way.

Trucks have been provided at Jacksonville, Fla., to reach the industries located on the development of the Commodore Point Terminal Company's property on which are to be located wharves and terminal warehouses.

The train yard at Raleigh, N. C., is now being rearranged and extended to give an increased capacity of approximately 625 cars, and also, to provide tracks of sufficient length to accommodate a large car lot. Extensions to this yard at Monroe, N. C., Howells, Ga., and Charleston, S. C., are also under construction and will be completed during the coming year.

Second main track is being provided from the south end of Raleigh train yard in connection with the present Raleigh-Cary double tracks, thus constituting a continuous double track from the train yard to Cary.

New passenger stations are now in process of construction at Florence, S. C., and Manatee, Fla., and the present station at Charlotte, N. C., is being completely remodeled and extended. All of this work will be completed during the coming year.

Construction is also in progress on Union Passenger Stations at Cary, N. C., Rochelle, Ga., and Ocala, Fla., all of which will be finished during the coming year.

The present umbrella shed at Henderson, N. C., has been extended during the year, and a new shed has been provided at Catawba Junction, S. C.

A new combined passenger and freight station has been completed at Ailey, Ga., and one is now under construction at Bee Ridge, Fla.

A freight depot has been provided at Palmetto, Fla., and one is now being built at Helena, Ga.

Additional fire protection facilities are now being installed at the Shops, Savannah, Ga.

Important paving and street work has been done at Greenwood, S. C., Savannah, Ga., Orlando, Fla., Tampa, Fla., Bradenton, Fla., Manatee, Fla., Sarasota, Fla., and through several other points on the system to comply with municipal requirements.

Necessary dredging has been done during the year to maintain the required depths of water at the following terminals: Tampa, Fla., Hutchinson Island, Savannah, Ga., and Charleston, S. C.

6 track scales were rebuilt with concrete foundations and steel "I" beams, replacing wood.

4 old water tanks were replaced with new 50,000 gallon tanks and suitable pumping facilities provided.

113 industrial sidings and extensions to industrial sidings already existing have been constructed or are in process of construction.

15 depots and freight stations have been constructed or substantially added to during the year.

20 passing tracks have been constructed or extended or are in process of construction.

The heavy rains which prevailed in the Carolinas during July washed out and destroyed a section of steel bridge, total length of which aggregated 1,242 feet, also about 1 1/2 miles of trestle, and in addition thereto the roadbed was overflowed and impassable at several other points. During this period, through main line service was interrupted.

The work of the Federal Act to Regulate Commerce was continued during the year at a cost of \$56,983.55, which was charged to General Expenses.

The Territory served by the Seaboard is unsurpassed in the United States for traffic producing potentialities by reason of the mineral resources, water powers, port facilities, lumber reserves, fertile lands, long growing seasons, and the capacity for varied production at all seasons. It is the policy of the road to build and broaden the foundation for permanent success through systematic development by colonization and immigration activities, the stimulation of agricultural and horticultural pursuits, and the location of industrial enterprises.

The time and money expended as a result of the passage of the Federal Act to Regulate Commerce was continued during the year at a cost of \$56,983.55, which was charged to General Expenses.

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CHANGES IN ORGANIZATION.

Mr. G. S. Rains was appointed Freight Traffic Manager on July 1, 1916, succeeding Mr. L. E. Chaloner, resigned to become Chairman of the South-eastern Freight Association.

Mr. W. Stanley was appointed Assistant to President, with offices at Atlanta, Ga., effective November 1st, 1916, being a new position created to provide for efficient dealing with the public and Railroad Commissions.

Effective November 1st, 1916, the office of General Claim Agent was abolished. Mr. W. G. Lavine was appointed Attorney in Charge of Personal Injuries and Mr. W. C. Moore was appointed Freight Claim Agent. These are new positions, embodying the work formerly handled by the General Claim Agent.

Effective September 1st, 1917, Judge Lech R. Watts at his request, was relieved from the office of General Counsel, and appointed Consulting Counsel. Mr. E. Marvin Underwood was appointed General Counsel.

Effective June 15th, 1917, Mr. L. C. Fritch was appointed General Manager.

The Board records its thanks and appreciation to the officers and employees for the faithful discharge of their duties during the year.

By order of the Board: W. J. HARAHAH, President.

CAPITAL EXPENDITURES FOR ROAD AND EQUIPMENT.

YEAR ENDED DECEMBER 31, 1916.

SUMMARY OF EXPENDITURES:

Additions and Betterments on Existing Mileage	\$2,005,848.17
Equipment Acquired	172,315.26
Expenditures for Extensions	21,094.27

TOTAL AS ABOVE

[Adv.]

Railway Officers

Executive, Financial, Legal and Accounting

C. M. Ball has been appointed assistant to the vice-president and general manager of the Oregon Short Line, with headquarters at Salt Lake City, Utah, succeeding E. L. Hickey, promoted.

W. T. Kemper, receiver, has been elected president of the Kansas City, Mexico & Orient. Herbert F. Hall was elected chairman of the board of directors and A. De Bernardi, Clifford Histed and H. S. Garret have been elected vice-presidents, and M. L. Mertz, a member of the board.

A. M. Penney, vice-president and general traffic manager of the Waupaca-Green Bay, Waupaca, Wis., has been elected president to succeed John Gordon, deceased. Irving P. Lord, secretary and general consul, has been elected vice-president to succeed Mr. Penney. H. G. Breit was elected secretary to succeed Mr. Lord, who still retains the general consulship of the company.

Charles Henry Ewing, who has been appointed vice-president of the Philadelphia & Reading, with headquarters at Philadelphia, Pa., was born on May 28, 1866, and began railway work on

August 1, 1883, in the engineering department of the Philadelphia & Reading. He was appointed supervisor in December, 1891, of the same road and from 1893 to July, 1902, was chief engineer of the Central New England Railway. He was then, to June, 1905, division engineer of the Reading and Lebanon divisions of the Philadelphia & Reading. In June, 1905, he was appointed engineer maintenance of way of the same road, remaining in that position until 1910, when he became superintendent of the Atlantic City Railroad.

On January 1, 1913, he was appointed general superintendent of the Philadelphia & Reading, and in March, 1916, was appointed general manager, which position he held at the time of his recent appointment as vice-president of the same road, as above noted.

Operating

J. C. Austin, trainmaster of the Southern Railway at Wilton, Ala., has been appointed trainmaster, with office at Birmingham, vice T. O. Crane, transferred.

W. M. Weidenhamer, division superintendent of the Chicago, Burlington & Quincy at Alliance, Neb., has been appointed inspector of transportation of the Chicago, Milwaukee & St. Paul.

W. H. Kirkbride, division engineer of the Sacramento division of the Southern Pacific, with office at Sacramento, Cal., has been appointed assistant superintendent of the same division with headquarters at Sacramento, succeeding J. T. Bell, who has been transferred to the Salt Lake division.

W. T. Wolff, special agent in the operating department of the Pennsylvania Lines West at Pittsburgh, has been appointed superintendent of freight station service, with headquarters in the same city. The position is a new one and its duties are to direct as to classifications for the loading of l. c. l. freight; to have general supervision over all service incident to the intensive loading of c. l. freight (including coal) and of l. c. l. freight; to keep in touch with details of all operations at freight stations, including the weighing of l. c. l. freight and the use of mechanical devices, and to make appropriate recommendations to division superintendents in the interest of efficiency and uniformity of

practice. Mr. Wolff will work under the direction of the superintendent of freight transportation.

O. C. Hibbs, whose appointment as assistant superintendent of the Chicago, Burlington & Quincy, with headquarters at Dayton Bluff, Minn., was announced in these columns on December 7, was born at Fontanelle, Iowa, on July 3, 1882. He entered the service of the Burlington on June 10, 1899, serving as operator and train dispatcher on the Ottumwa division until December 1, 1906. From December 1, 1906, to October 25, 1912, he was night chief dispatcher, and from October 25, 1912, to July 1, 1916, he was chief dispatcher at Galesburg, Ill. On July 1, 1916, he was promoted to trainmaster at Galesburg, Ill., which position he held until the time of his appointment, as noted above, effective December 1.

Traffic

John A. Groves, commercial agent of the Atlanta, Birmingham & Atlantic, has been transferred from Kansas City office to New York office.

R. M. Calkins, traffic manager of the Chicago, Milwaukee & St. Paul at Seattle, Wash., has been promoted to vice-president in charge of traffic for the entire system, including subsidiary

lines, with headquarters at Chicago, effective December 15. Mr. Calkins succeeds J. H. Highland, vice-president in charge of passenger traffic, and E. S. Keeley, vice-president in charge of freight traffic, both of whom have resigned. Mr. Calkins was born at Ogdensburg, N. Y., on August 12, 1863. He entered railway service in 1879 as a clerk and telegraph operator on the Chicago, Milwaukee & St. Paul at Monticello, Iowa. Subsequently he was local agent at various points, including Oxford Junction, Iowa, Sigourney and Ottumwa,

between December, 1881, and June 15, 1892. For four years he was agent at Kansas City, Mo., and on June 30, 1896, he was appointed division freight and passenger agent at Mason City, Iowa. On June 25, 1898, he left the St. Paul to become general freight and passenger agent of the Des Moines Northern & Western at Des Moines, Iowa. He returned to the St. Paul as assistant general freight agent with headquarters at Chicago on February 10, 1899. Ten years later he was appointed general freight and passenger agent of the Chicago, Milwaukee & Puget Sound and the Montana Railroad, with headquarters at Butte, Mont. From June 26, 1910, to January 1, 1913, he was traffic manager of the Chicago, Milwaukee & Puget Sound, and from the latter date until December 15, 1917, he has been traffic manager of the Puget Sound lines of the Chicago, Milwaukee & St. Paul, with headquarters at Seattle, Wash.

G. C. Henderson, traveling freight and passenger agent of the Denver & Rio Grande, with headquarters at Kansas City, Mo., has been promoted to general agent, with headquarters at Ft. Worth, Tex., succeeding J. E. Woodfin, resigned. H. I. Scofield, traveling freight and passenger agent, with headquarters at Detroit, Mich., has been promoted to general agent with the same headquarters, succeeding A. E. Brown, resigned, effective December 1.

C. C. Clark, general agent in the passenger department of the Michigan Central, with headquarters at Chicago, has been promoted to assistant general passenger agent with the same headquarters, effective December 1. He was born at Loveland, Ohio, and entered the service of the Cincinnati, New Orleans & Texas Pacific in 1889. In 1895 he was appointed soliciting passenger agent of the Cleveland, Cincinnati, Chicago & St. Louis at Cincinnati, Ohio, following which he was assistant ticket agent, traveling passenger agent and city passenger agent on the same



C. H. Ewing



R. M. Calkins

road. In 1905 he was appointed general agent in the passenger department with headquarters at Columbus, Ohio, and subsequently he served as general agent at Indianapolis, Ind., and Cincinnati, Ohio. On January 22, 1911, he was appointed general agent of the passenger department of the Big Four and Michigan Central in Chicago. On the separation of these two roads Mr. Clark remained with the latter road in the same capacity, which position he held at the time of his appointment, as noted above.

A. E. Brown, general agent of the Denver & Rio Grande, with headquarters at Detroit, Mich., has been appointed general agent in the traffic department of the Chicago & Alton, with headquarters at Detroit, succeeding Arthur Maedel, transferred in the same capacity to Peoria, Ill., succeeding S. A. Williams, whose promotion to general agent in charge of operation and traffic at St. Louis, Mo., was mentioned in these columns on October 5.

Engineering and Rolling Stock

W. D. Hitchcock has been appointed master mechanic of the Albuquerque division of the Atchison, Topeka & Santa Fe, with headquarters at Winslow, Ariz., succeeding M. Weber, transferred, effective December 1.

H. R. Warnock, superintendent of motive power of the Western Maryland at Hagerstown, Md., has been appointed general superintendent of motive power of the Chicago, Milwaukee & St. Paul, with headquarters at Milwaukee, Wis., succeeding A. E. Manchester, deceased.

C. A. Wirth, road foreman of engines of the Northern Pacific, with headquarters at Pasco, Wash., has been appointed master mechanic on the Pasco division, with the same headquarters, succeeding G. F. Egbers, granted leave of absence to enter the Russian Railway Service Corps, effective October 13. E. P. Smith has been appointed road foreman of engines on the Minnesota division, with headquarters at East Grand Forks, Minn., succeeding L. L. Moebeck, transferred, effective November 12.

W. E. Ricketson, mechanical engineer of the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Beech Grove, Ind., has been appointed chief of the equipment division, valuation department of the New York Central Lines, with headquarters at New York, taking the place made vacant by the death of Mr. Buchanan last February. Mr. Ricketson was graduated from Cornell University in 1907, with degree of M. E. and began railway work in 1903 with the Delaware & Hudson Company, for which company he worked during his summer vacations while attending college. From 1907 to 1910 he was special apprentice with the Lake Shore & Michigan Southern, and the following two years successively was roundhouse foreman of the Lake Erie, Alliance & Wheeling at Alliance, Ohio, and the Lake Shore & Michigan Southern at Ashtabula. He was then general foreman of the latter road at Youngstown, Ohio, until September, 1913, when he was appointed assistant mechanical engineer of the Cleveland, Cincinnati, Chicago & St. Louis. On March 1, 1914, he was promoted to mechanical engineer, which position he held until his recent appointment as chief of the equipment division, valuation department, of the New York Central Lines, as above noted.

The following additional changes have been made as a result of the reorganization of the mining and fuel department of the Chicago, Rock Island & Pacific, noted in the issue of December 7, page 1060. The supervision of the use of fuel, formerly under the direction of the mining and fuel department, will henceforth be handled by the mechanical department. H. Clewer, master mechanic at Trenton, Mo., has been appointed superintendent of fuel economy, with headquarters at Chicago. His duties in this position include the supervision of the use of fuel, locomotive supplies, lubricating materials and general features in connection with the efficiency of locomotive operation. John Benzies, road foreman of equipment at Trenton, Mo., has been appointed supervisor of fuel economy of the Chicago Terminal, Illinois, and Missouri divisions, with headquarters at Rock Island, Ill. F. Meredith, road foreman of equipment at Silvis, Ill., has been appointed supervisor of fuel economy of the Iowa, Nebraska and Colorado divisions, with headquarters at Fairbury, Neb. P. Smith, assistant engineer of fuel economy, has been appointed supervisor of fuel economy on the Cedar Rapids, Minnesota, Dakota and Des Moines divisions, with headquarters at Cedar Rapids, Iowa. F. Connolly, road foreman of equipment,

at Herington, Kan., has been appointed supervisor of fuel economy of the St. Louis, the Kansas City Terminal, the Kansas and the El Paso divisions, with headquarters at Herington, Kan. W. H. Booth, road foreman of equipment, at El Dorado, Ark., has been appointed supervisor of fuel of the Louisiana, Arkansas and Indian Territory divisions, with headquarters at Little Rock, Ark. J. L. Curry, road foreman of equipment, at El Reno, Okla., has been appointed supervisor of fuel economy on the Oklahoma and Pan Handle divisions of the C., R. I. & P., and also of the Southern and Amarillo divisions of the Chicago, Rock Island & Gulf Railway, with headquarters at El Reno, Okla. J. H. Edwards, electrical foreman at Silvis, Ill., has been appointed supervisor of stationary plants, with headquarters at Chicago, with supervision over stationary plants and pumping stations. F. W. Wilson, engineer of fuel economy, has been appointed chief fuel inspector, reporting to the fuel agent. W. J. Eddy, superintendent of fuel economy, has been appointed master mechanic at El Dorado, Ark.

William T. Covert, who has been appointed principal assistant engineer of the Western Pennsylvania division of the Pennsylvania Railroad, with office at Pittsburgh, Pa., as has already been

announced in these columns, was born on January 4, 1873, at Philadelphia, Pa., and was educated in the public schools and in 1890 graduated from the Peirce School of Business of his native town. In May of the same year he entered the service of the Pennsylvania Railroad as a clerk in the accounting department at Philadelphia. The following September he was transferred to the maintenance of way department as a rodman and later served in various positions in connection with construction work being carried out in New Jersey and the city of New York by the engineer of maintenance of the United Railroads of New Jersey. During this time he attended Cooper Institute, New York, and graduated with the degree of B. of S. On October 3, 1895, he was transferred to the office of the principal assistant engineer, of the Pennsylvania Railroad, at Altoona, Pa., and in June, 1897, was appointed assistant supervisor of the Philadelphia division at Paoli. He was promoted to supervisor of the Renova division at Johnsonburg, Pa., in July, 1900, and subsequently served consecutively as supervisor at Philadelphia yard, assistant engineer of the Chautauqua division, assistant engineer of the Eastern and Susquehanna division and as division engineer of the Philadelphia Terminal division, from which position he was promoted on October 25 to principal assistant engineer of the Western Pennsylvania division of the same road, with headquarters at Pittsburgh, as above noted.



W. T. Covert

Purchasing

F. W. Taylor, general purchasing agent of the Pacific Electric with headquarters at Los Angeles, Cal., has been appointed general purchasing agent of the Southern Pacific to succeed I. O. Rhoades, retired, with headquarters at San Francisco, Cal., effective December 1.

OBITUARY

W. H. Knight, former traffic manager of the Union Pacific, died at Hinsdale, Ill., on December 10.

E. A. Dawson, who retired as manager of the Star Union Line, Pennsylvania System, at Chicago on December 1, 1915, died in Evanston, Ill., on December 7.

Thomas A. Ayres, assistant purchasing agent of the Erie with office at New York, died on December 9, at his home in Ridgewood, N. J., at the age of 38.



“On earth peace, good will toward men”



At no time since the birth of Christ have these words possessed more solemnity or more truly expressed the real sentiment of all true Christians than now. Would that we could chant them this Christmas Day as heralding a new-born world freedom!

But Prussianism, forgetting ancient Bethlehem and the “Stille Nacht, heilige Nacht,” unsheathed its sword and set the world aflame. Thus today we find the Caucasian, the Mongolian, the Ethiopian, the American Indian, and the Malayan fighting side by side that the earth may be made safe for their children and their childrens’ children.

To America has fallen the lot of striking the final blow which shall crush that awful Thing with its venomous sack and thirst for blood and rape. May God grant to us that certainty of aim and strength of arm so that on the next anniversary of the birth of our Savior we may shout with a full heart, “Peace, peace to him that is far off, and to him that is near.”



Railway Age Gazette

Volume 63

December 21, 1917

No. 25

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GENERAL NEWS SECTION.....

Unprecedented war-time traffic has produced a crisis which calls for the intensive utilization and co-ordination of all

The Co-ordination of All Transporta- tion Agencies

existing transportation facilities, as well as the conscientious and intelligent co-operation of the public and the carriers. The organization of the Railroads' War Board, the pooling of box cars, the substantial results achieved by shippers and railroads alike in effecting heavier car-loading and in diminishing delays in car movement, the release of locomotives and fuel for freight traffic by reductions in passenger service, and the pooling of facilities on lines in Official Classification territory are important steps which have already been taken to increase the carrying capacity of the railways. In addition, plans are under way for the more extensive use of electric roads, highways and waterways for the movement of freight. A Highway Transportation Committee, recently appointed by the Council of National Defense, is studying the possibilities of motor truck transportation as an auxiliary to the railroads. As the success of the motor vehicle as a freight carrier depends on the condition of our highways some modification of the recent priority order denying the use of open top cars for materials needed for highway construction may be desirable. The formation of the Electric Railways War Board was recently noted in the *Railway Age Gazette* and the steps taken under the direction of that body to organize electric railway facilities for freight transportation were outlined in the *Railway Age Gazette* of December 7, page 1048. It is worthy of note that the electric lines, which have a total operated length of about 40,000 miles, do not intend to undertake freight movement separately from the steam lines but will endeavor to co-operate with them to the end that traffic may be moved most expeditiously and with the least danger of congestion. Through the influence of the United States Food Administration shipping on the Great Lakes, which usually stops on December 1, will continue, in part, as long as weather conditions permit. All these developments are in the direction of maximum transportation efficiency and greater co-ordination of different kinds of carriers, at the same time pointing to further possibilities of

improvement in the future. It is patent that war conditions will not brook competition between carriers of the same kind or of different kinds, but they call for the operation of all transportation agencies as parts of a great whole, laboring under a tremendous burden which must be borne successfully until the war is won.

By a little deft cross-examination of J. F. Shaughnessy, of the Nevada Railroad Commission, on his testimony before

A Rule That Works Both Ways

the Newlands Committee this week, Senator Cummins punctured rather effectively the argument of the intermountain interests that Congress should pass a law containing a rigid long and short haul prohibition. Mr. Shaughnessy and other representatives of the intermountain section are asking Congress to enact a general rule, which would upset commercial conditions in all parts of the country, for the benefit of their own section. They ask that the railroads be prohibited from charging a higher rate for the short haul from the east to the interior than they charge to the Pacific coast to meet water competition. Senator Cummins asked the witness, as he had asked several other intermountain witnesses at the San Francisco hearing, why he had stopped at asking a prohibition of a higher charge, and why he had not asked that as high a charge for a short haul as for a long haul be forbidden. Mr. Shaughnessy, as had several of the other witnesses, replied that the intermountain country could "get along very nicely on equal rates" westbound, and that it wanted a continuance of the blanket rate system eastbound. Senator Cummins then pointed out that the argument for a rigid long and short haul clause, carried to its logical conclusion, would condemn all blanket rates, and that Congress could not pass special legislation but must act according to a general principle, such as a declaration that rates should be based on cost of service, or be made on a mileage basis. Mr. Shaughnessy did not care to go that far because the extension of his argument to its logical conclusion, while conferring one advantage on his section would take away another! No section or community ever finds fault with disregard of distance in rate-making

when the result is to favor it at the expense of competing sections and communities; but how wrong and downright vicious is disregard of distance when it helps competitors at the expense of the very same section or community!

Fuel economy in its broadest sense is an operating problem of direct interest to the transportation department. The

A Noteworthy System of Fuel Records

cost for fuel is a matter that every operating officer and particularly the division superintendent should watch closely, especially at this time; adequate records are necessary for this purpose. The division superintendent who seeks to lower the cost of operation must have available fuel statistics in sufficient detail to permit the consideration of this expense, as well as that of labor or any other expense, whenever he has any changes in operation in mind. An exceptionally good method of doing this was described in a paper by W. L. Robinson, supervisor of fuel consumption of the Baltimore & Ohio at a recent meeting of the New England Railroad Club, an abstract of which appears elsewhere in this issue. At a cost of 0.45 cents per ton of coal information is provided which may be considered as a barometer of the mechanical operating conditions on the road and which keeps the operating officers in close touch with the cost of fuel—the largest single item of operating expense. Among other things, a poor fuel performance is indicative of improperly maintained power, improper handling of trains, a poor quality of coal, or a lack of proper instruction of engine crews. This is what an operating officer should know and it gives him the opportunity of detecting the weak places in his organization. At the same time this system of fuel records shows the men on the locomotives that their work is being constantly watched; it shows the road foremen of engines which men need special supervision and instruction; and it brings out the mechanical defects of locomotives which affect fuel consumption for the benefit of the repair forces. The work on the Baltimore & Ohio is under the direction of a staff officer who reports directly to the operating vice-president. This brings the fuel problems before the operating staff in their true light and makes this question an operating problem instead of purely a mechanical department one.

AN UNPRECEDENTED SIX MONTHS' RECORD

APPROXIMATELY complete statistics of freight movement during the first six months after the United States entered the war—that is, April to September, inclusive—which have been compiled by the Bureau of Railway Economics for the Railroads' War Board, disclose that in that period the railways not only handled far more traffic than in any earlier six months of their history, but also as much as in any entire year prior to 1907.

It will be recalled that the years 1906 and 1907 marked the climax of a long period of rapid increase of railroad business which resulted in the longest and most acute congestion of traffic and "shortage" of cars ever known until recent months. It is, therefore, not without significance that in the first six months of 1917 after the country entered the war the railways handled as much freight as they did in the entire year 1906.

In 1915 the railways handled only 30 per cent more freight than in 1906, while in 1917 they are handling approximately 100 per cent more than they did in 1906. These facts illustrate not only the enormous increase which has occurred in railway freight business during the past eleven years but also how swiftly the bulk of the increase has come within the last two years.

The total number of tons of freight handled one mile in the six months April to September by Class I roads han-

dling about 95 per cent of the freight traffic of roads of that class was 204,702,861,865. This is an increase of 14 per cent over the freight business handled by the same roads in the same months of 1916. The increase in the average tons hauled per car was from 24.8 to 27 tons, or 9 per cent, and the increase in the average tons hauled per train was from 626 tons to 675 tons, or 7.8 per cent.

It is interesting, as indicating the increase in the efficiency of railroad operation which has occurred since 1906, to note that in that year the average freight train load was only 344 tons, as compared with the record of 675 tons per train made in the months, April to September. If the railroads had moved the traffic of these six months of 1917 in the same average trainload as they handled the freight of 1906, they would have had to render in these six months about 96 per cent more freight train service than they actually did render. They ran freight trains 330,000,000 miles in that six months. On the basis of the trainload of 1906 they would have had to run them about 645,000,000 miles.

The economy effected by this increase of the average trainload and the resulting saving of freight train service is the only thing which has enabled the railway system of the country to remain solvent in the face of almost stationary freight and passenger rates, and enormously increasing expenses of all kinds. Of course, economies have been effected by other means than increases of the trainload, but it is by this means that the really big saving has been made.

The labor brotherhoods are opposed to the big trains. The government apparently is soon going to take control of the operation of the railroads. In view of the attitude of the brotherhoods it will be highly interesting to see what policy the government railroad controller, if one is appointed, will adopt with reference to increases in trainloads.

THE TRUTH ABOUT THE COAL SITUATION

THE National Coal Association by its secretary, J. D. A. Morrow, has written the *Railway Age Gazette* a letter which appears elsewhere in this issue. It is in reply to the editorial, entitled "The Coal Situation—A National Menace," which was published in our issue for November 30.

The impression which many persons have been given by what has been said in the newspapers is that there has been an actual reduction this year in the amount of coal mined and transported. No impression could be more erroneous. The coal production of 1916 was the largest up to that time. Data regarding the amount of coal moved by the railways are available for the months, April to November, 1917, inclusive. In those eight months 175,986 more carloads, or about 10,000,000 more tons, of anthracite were moved than in the same months of 1916, an increase of 15 per cent. In the same months 925,691 more carloads, or about 51,000 more tons, of bituminous coal were moved than in the same months of 1916, an increase of 18 per cent.

Formerly large amounts of coal were carried by vessels on the Great Lakes, in the coastwise service, and running between the Atlantic and Pacific coasts through the Panama canal. Most of these vessels have been diverted to transoceanic service. In consequence, not only have the railways had to meet an increase in the output of coal, but they also have had to carry vast amounts of coal which formerly were carried by water. It is an illustration of the unfairness of Dr. Garfield, the government fuel administrator, and other persons who attribute the present coal situation to the shortage of transportation facilities, that they always talk about the alleged "car shortage" but never about the vessel shortage. The reduction in the amount of coal being carried by water has not only made it necessary for the railways to carry more tons of coal than formerly, but has also made it necessary for them to carry it a greater average distance: for the sections to which the boats carried the most coal—

the Pacific coast, the Northwest, and New England—are all relatively remote from coal mines. This increase in the tonnage to be moved and in the distance it has had to be moved have imposed a double burden on the car supply.

And, unfortunately, neither the government Fuel Administration nor the coal producers have shown the inclination or constructive ability which they should have shown in lightening the burden on the railways. There is a great deal of "cross hauling" of coal. Instead of coal being consumed almost entirely in the territories adjacent to the mines in which it is produced it wanders all over the country seeking its markets. West Virginia coal often passes almost directly through the great Illinois and Indiana field to the Northwest, and Illinois and Indiana coal coming eastward meets it on the way. Coal from the Pittsburgh field passes directly through the great coal mining districts farther east on its way to New England, and meets coal from those eastern fields going west.

This cross hauling of coal was not intolerable, or perhaps even undesirable, before the war. It has become intolerable since we entered the war because of the enormous waste of transportation which it involves. The remedy for it is to restrict the movement and consumption of all coal, except special kinds needed for special purposes, to the immediate zones within which it is produced. A large saving of transportation and increase of coal production could be secured in this way; and the adoption of some such scheme repeatedly has been suggested; but those who should have adopted it have been so busy "passing the buck" to the railroads that they have not had left any time, energy or initiative for the adoption of needed constructive measures.

In addition, the abuse of cars by coal shippers and consignees, which always has prevailed widely, has continued. Senator Pomerene of Ohio recently cited an example which he said came under his personal observation. This was the case of a coal dealer in Ohio who held loaded coal cars until they accumulated \$400 in demurrage, in order that he might increase by \$1600 his profit on the coal. The abuse of the reconsignment privilege has continued to be flagrant. And yet in the face of all such facts the Fuel Administration and the coal producers have the effrontery to continue to issue statements and make speeches charging the railroads with almost entire responsibility for the coal situation!

The line of argument adopted by Secretary Morrow in his letter which we publish elsewhere is typical of that which has been taken by the spokesmen of the National Coal Association and by the Fuel Administration. Mr. Morrow says: "The reports of the Federal Trade Commission and the United States Geological Survey show that the coal operators have furnished the nation with men and equipment at the mines to produce 700,000,000 tons of bituminous coal annually. The output this year will be some 540,000,000 tons. It is true that fires, floods, accidents, breakages and labor difficulties have caused the loss of some coal that might have been mined, but the official figures indicate that nearly 100,000,000 tons were not produced because of transportation difficulties."

Now, let us turn to the reports of the United States Geological Survey and find what they actually do show. They are compiled, it should be borne in mind, from reports made by the mine operators themselves. The weekly reports of the Geological Survey give the total amount of coal produced; the percentage which this production is of "full time output"; the percentage of failure to secure "full time output" due to "car shortage" and the percentages of failure to secure "full time output" due to "labor trouble and shortage," "mine disability," and all other causes. We have prepared a table based upon these reports of the Geological Survey for twenty-two consecutive weeks which is given here-with.

This table shows that in ten of these twenty-two weeks

a larger part of the failure to secure full time output was attributed to other causes than to transportation conditions. The mines reporting fell short of full time output during these twenty-two weeks by 60,500,000 tons; and the coal producers themselves attributed 52 per cent of this failure to transportation conditions, and 48 per cent of it to causes under the control of themselves, if of anybody!

"Under such conditions," Mr. Morrow concludes, "doesn't it seem rather futile and absurd to talk of the operators' failure to produce some millions of tons of coal? What could have been done with it, when the roads couldn't transport what actually was mined?" The answer is afforded by the statistics given in our table which demonstrate that at least 48 per cent of the failure to secure "full time output" has been due, according to the reports of the mine operators themselves, to their own failure to furnish coal for transportation when the railways were ready and able to move it.

One of the significant facts disclosed by our table is the tendency of coal production for some months after the government fixed coal prices. Secretary Baker's letter repudiating the agreement regarding prices made by Secretary Lane

TABLE I

Statement of Bituminous Coal Produced and Percentage of Full Time Capacity Output Lost Through Causes Within Control of Producers and Carriers Respectively. Weekly Figures, July 7 to November 24, Inclusive, 1917

Week ended	Tons produced	Per cent full time output produced	Full time output (100%)	Per cent full time output except car shortage	Tons lost, all causes, in control producers	Tons lost from R. R. causes
July 7	2,466,000	77.4	3,200,000	12.6	403,200	320,000
14	3,049,000	76.3	4,000,000	8.5	351,000	600,000
21	3,140,000	74.4	4,200,000	9.0	362,800	697,200
28	5,844,000*	76.0	7,700,000	10.1	785,700	1,070,200
Aug. 4	5,322,000*	75.1	7,100,000	10.0	710,000	1,057,900
11	5,653,000*	73.8	7,660,000	13.5	957,586	1,049,420
18	6,141,000*	67.2	9,138,000	22.2	2,028,372	968,628
25	6,325,000*	74.2	8,524,000	15.5	1,321,028	877,972
Sept. 1	6,323,000*	77.1	8,201,000	12.6	1,033,297	844,703
8	5,744,000*	79.8	7,198,000	13.7	886,130	467,870
15	11,070,000*	78.0	14,192,000	12.2	1,731,184	1,390,816
22	10,377,978	71.9	14,460,000	18.7	2,704,000	1,359,240
29	10,916,113	74.3	14,703,000	14.9	2,190,000	1,587,000
Oct. 6	10,616,053	74.2	14,300,000	16.6	2,373,800	1,315,600
13	10,766,977	76.9	14,000,000	10.1	1,414,000	1,820,000
20	9,979,180	65.8	15,170,000	22.7	3,443,000	1,744,550
27	10,688,313	74.9	14,300,000	10.3	1,473,000	2,116,400
Nov. 3	10,802,841	75.4	14,320,000	10.1	1,446,000	2,076,400
10	11,116,356	77.8	14,290,000	6.9	885,600	2,187,370
17	11,325,202	75.3	15,000,000	5.3	795,000	2,910,000
24	11,232,922	74.2	15,140,000	5.6	847,840	3,058,280
Dec. 1	10,347,482	73.9	14,000,000	6.5	910,000	2,744,000
					29,252,931	32,263,649

*Carloads of coal multiplied by 58.

and the coal operators was made public on July 4. At that time the production of coal was running at the rate of 77.4 per cent of "full time output." The percentage of "full time output" being produced immediately began to decline and continued to do so for six weeks, until in the week ending August 18 it was only 67.2 per cent. Meantime the failure to secure "full time output" due to causes other than lack of transportation facilities increased from 12.6 per cent to over 22 per cent. The railways during this time could have handled millions of tons more coal than was produced. Again, in the week ending October 20 the output secured dropped to 65.8 per cent of "full time output," and the output lost due to causes in no way related to transportation conditions increased to almost 23 per cent. In this period, again, the railways could have hauled millions of tons more than were produced. If the mine operators at all times had been as well prepared to produce coal as they contend, by implication, that the railways should have been to transport it, the amount of coal produced and transported would have been many millions of tons greater than it has been.

Whether, under all the conditions, the mines could have produced and the railways could have transported enough coal to meet all demands is very questionable. The increase

in the demand has been very great; and it will continue to be so. The railways and the coal producers will not increase the output by continuing to "pass the buck" to each other; but they can increase it by co-operating in an effort to remove the various formidable obstacles to larger production which now exist.

THE WAR AND ENGINEERING STUDENTS

THE instructions issued by Provost Marshal General Crowder on last Saturday, deferring the calling of students in engineering colleges under the provisions of the draft and permitting them to enter the engineer enlisted reserve corps and to complete their education, will do much to remove a situation which was rapidly threatening to become serious to the government as well as to the railways and other agencies on which the government is dependent for service. Not only have large numbers of recent graduates left industrial work to enter various branches of military or naval service through voluntary enlistment or conscription but the present senior classes in the engineering colleges have been depleted to such an extent that only a fraction of the normal number of men will be graduated next spring. This same condition is already being reflected to an almost equal extent in the junior or 1919 class, and is also being felt in lower classes. A recent survey of the enrollment in about 60 of the leading engineering schools of this country showed a reduction of 45 per cent in the number of seniors and of 30 per cent in juniors as compared with a year ago. Within the last few weeks there has been a further and particularly heavy exodus of members of these classes, while the calling of additional men under the provisions of the selective draft would have again reduced the number remaining in the colleges. Even excluding the further draft, the number of graduates available for the government and for the industries of the country next spring will only be a small proportion of the normal number and the same condition may be expected in 1919. This is occurring at a time when the demand for engineers is greater than ever before.

Becoming alarmed at the results which would inevitably follow a continuance of this tendency, several of the leading national engineering societies called this condition to the attention of the government a few days ago with the result indicated above. In harmony with the spirit of the selective draft law to place every man where he will be of the most value to the country, similar action had already been taken by the government, with reference to dental and medical students, the basis for action in these cases being that these men are more valuable to the country in their professional capacities after completing their education than they would be as privates in the ranks if taken before the completion of their college courses.

This same argument applies to engineers. In no previous war have engineers played as important a part. They are being employed in professional capacities in larger numbers than in any previous conflict. The same tendency is present in the industries working on government business, while the unusual demands now being made upon the railways and other industries are further increasing the need for men with engineering training. It is evident that both during the continuance of the present conflict and in the period of reconstruction which must necessarily follow the conclusion of the war, engineers will be greatly in demand. With the heavy wastage which must inevitably occur in Europe and with the shutting off of the supply of engineers from the colleges, this country was threatening to deprive itself of the services of a class of men which it will sorely need.

The railways have suffered acutely from the shortage of engineers during the past year. On a number of roads contractors have been delayed and work held up pending the completion of plans and the staking out of the projects. On

many roads supervision of improvement work has been greatly curtailed with all the detrimental results which necessarily follow. Conditions have been aggravated during the last few weeks by the enlistment of registered men who wished to get into various branches of the service now closed to them. As a result the engineering department on many roads and particularly in the valuation work has been threatened with serious disorganization. While the action of Provost Marshal General Crowder will have only partial effect this year, the precedent thus established will tend to conserve the engineering resources of the country and will make available for the railways and for other industries, as well as for the government itself, the services of a class of men seriously needed.

NEW BOOKS

Proceedings of the American Society for Testing Materials. Edited by Edgar Marburg, secretary-treasurer, University of Pennsylvania, Philadelphia, Pa. Two volumes. Illustrated, 6 in. by 9 in. Part 1, 875 pages, Part 2, 675 pages. Bound in paper, cloth and half leather. Published by the Society, Philadelphia, Pa. Price per volume, paper \$5, cloth \$5.50, half leather \$6.

These two volumes contain the proceedings of the twentieth annual meeting which was held at Atlantic City, N. J., June 26-29, 1917. In Part 1, 451 pages are devoted to the reports of committees and to the discussion of these reports. The next 305 pages contain the tentative standards of the Society for a wide variety of materials used in engineering work. Part 2 contains the technical papers, 29 in number, which were presented at this meeting and the discussion of them.

The proceedings of this Society are unusually well bound and printed and contain a large amount of authentic information regarding materials used by the railways and other industries.

Encyclopedia of Latin America. Edited by Marrion Wilcox and George Edwin Rines. Size 7 in. x 10 in. 887 pages, illustrated and with maps. Bound in buckram. Published by the Encyclopedia Americana Corporation, 27 William street, New York. Price \$10.

In this book the editors, assisted by a number of other authorities and members of the Encyclopedia of Americana staff, have gathered together seemingly nearly all of the important and interesting information concerning the countries of Latin America.

In the first place the fact that the Latin American countries have so many characteristics in common has enabled them to devote 160 pages to the general characteristics of the Central and South American nations, under such heads as the Latin-American Civilization, Education, Labor, Property Rights, Commercial Regulations, Industrial and Commercial Expansion, etc., including also 32 well-written pages by Otto Wilson, chief of the Latin American division of the Bureau of Foreign and Domestic Commerce on railway and other transportation. The major part of the book, namely, over 500 pages, is devoted to the various Latin American countries in detail. To take one example, the articles on Argentina which cover over 70 pages go into detail concerning its physiography, its population, its history, its government and its salient industrial and commercial characteristics, this including 3 pages which enlarge upon the general article on transportation mentioned above. There is also another important section of the book which deals with the leading industries of the Latin American countries and contains special information relative to the commerce of these industries in general and in detail. To take one or two examples, the section on cattle and meat, classified by countries, covers 20 pages, that on tobacco 13 pages, etc. The book is of special interest and value to any person interested in South and Central America, or to any one having to do in any way with the commerce and trade with the nations to which it relates.

Letters to the Editor

MR. WARFIELD REPLIES TO AN EDITORIAL

BALTIMORE, Md.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

In the issue of your paper of November 23 there was an editorial of apparent slight to Samuel Untermeyer, myself, or both. In your criticism of remarks made by me before the convention of the Investment Bankers' Association recently held in Baltimore your editorial attributes to Mr. Untermeyer the authorship of one of the legal opinions quoted by me in reference to the unconstitutionality of federal incorporation of the railroads without the unanimous vote of all of the stockholders of the railroads. As a matter of fact I never consulted Mr. Untermeyer on this subject, nor have I seen directly or indirectly any opinion from that gentleman in this matter, or even an expression of opinion by him. So far as I know Mr. Untermeyer had no knowledge whatsoever that I proposed making the address in question, nor did he know my views on the subject.

Therefore, your statement was a gratuitous misrepresentation of the facts, all of which you could have ascertained had you taken the trouble to do so. The legal opinions from which I quoted had been obtained by sources for their own purposes, and when it was heard that I intended taking the position I did in the address mentioned they were voluntarily sent to me. However, I was requested not to disclose the names of the lawyers giving such opinions. But let me say that I would consider any legal opinion given by Mr. Untermeyer on any subject as having great weight, for I entertain a high opinion of the legal ability of that gentleman.

S. DAVIES WARFIELD.

President National Association
of Owners of Railroad Securities.

[The *Railway Age Gazette* did not say that Mr. Untermeyer had given Mr. Warfield one of the opinions referred to. It merely said an eminent lawyer holding his views might give such an opinion. It did not intend "slight" to either Mr. Untermeyer or Mr. Warfield. It has high regard for both of them. But it always has been possible for us to respect men and at the same time dissent from the views expressed by them.—EDITOR.]

THE COAL SITUATION—A NATIONAL MENACE

WASHINGTON, D. C.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

In your edition of November 30 you published an editorial entitled "The Coal Situation—A National Menace," which merits a word in reply. The editorial is an attack on the Fuel Administration, the coal producers of the United States and on the National Coal Association. We feel certain that your sense of fairness would hardly have let you make some of the categorical charges you do make had you first informed yourself of the true conditions. Kindly permit us to call your attention to a few facts that we think should have been before you.

In the first place you say that we have attacked the railroads. Not at all. The nation finds itself short of coal in time of war. Official records show that the lack of railroad cars is the principal cause of the shortage. We have merely called attention publicly to this condition. We are convinced that this is the quickest way to remedy the shortage, and that, knowing the facts, the people will insist that effective measures be taken immediately to relieve an intolerable situation.

In reciting the facts we have carefully avoided "attacking" the railroads. In our statement of November 28, to which

you have referred, we said that the "National Coal Association recognizes that the railroads are congested and crowded with freight far beyond anything ever before experienced by them. * * * Only orders establishing the preferential movement of coal by the railroads, issued at once, can correct the situation. The public must recognize that such orders are for its benefit, and, therefore, must support the railroads in carrying them out."

In our statement of November 23 relating to the New England situation, we said: "The National Coal Association realizes the plight of the railroads under the enormous burden they have been called upon to bear and is co-operating sympathetically with railway officials in an effort to find a solution to their troubles so far as the movement of fuel is concerned."

In our statement of November 19 stating that bituminous coal production had been reduced approximately 2,000,000 tons during the preceding week by car shortage and congestion, we said: "Curtailed production is due almost wholly to the inability of the railroads in their present congested condition to supply the mines with an adequate number of cars for loading. The National Coal Association is endeavoring to co-operate with railway officials, the Fuel Administration and the Priorities Committee in finding a remedy for the situation."

In announcing the appointment of our traffic manager, November 13, we said: "The task of co-operating with the railroads to provide sufficient cars for the loading of 500,000,000 tons of bituminous coal annually has been delegated by the National Coal Association to John Callahan," * * * and "In carrying out this work Mr. Callahan will endeavor to assist the various governmental agencies involved, and the railroad companies in meeting the transportation demands of the coal industry."

It is the intention of the National Coal Association to continue to state facts of interest to the public in connection with coal supply and reduction from time to time. It is also our intention to continue to the utmost the work we have already begun of co-operating with the railroads in meeting transportation problems relating to fuel.

You charge the National Coal Association with being founded to "produce misinformation." You appear to have based this verdict on the circumstance that the Association stated that the loss of coal production on account of transportation deficiencies in the week ending November 17 was 2,000,000 tons. We admit that our statement was based on incomplete reports, but the conservatism of our estimate is clearly shown by the announcement of the United States Geological Survey that the correct figure was over 2,800,000 tons.

We have been equally conservative in other statements. Hence we have uniformly been more than fair to the railroads whenever we have had to speak of them in connection with the coal shortage. Moreover, if we influenced the Fuel Administrator to ask for priority and preference for coal shipments, it was only because the facts we presented clearly indicated the need of just such action. Since the chairman of the Priorities Committee has made an ineffectual attempt to grant such a preference, we wonder if even you may not have at least a suspicion that the National Coal Association has been giving out facts instead of "misinformation."

You accuse the coal operators of "want of diplomacy and capacity in dealing with their labor," etc. What of the railroads? We wonder if you have forgotten in so short a time the Adamson Law and the events that led up to its passage.

You attempt to lay upon the coal operators the blame for the coal shortage. Here again we wish to refer you to the official records which are open to the public. The reports of the Federal Trade Commission and the United States Geological Survey indicate that the coal operators have furnished the nation with men and equipment at the mines to produce 700,000,000 tons of bituminous coal annually. The

output this year will be some 540,000,000 tons. It is true that fires, floods, accidents, breakages and labor difficulties have caused the loss of some coal that might have been mined, but the official figures indicate that very nearly 100,000,000 tons were not produced because of transportation deficiencies. Under such conditions doesn't it seem rather futile and absurd to talk of the operators' "failure to produce some millions of tons of coal"? What could have been done with it, when the roads couldn't transport what actually was mined?

NATIONAL COAL ASSOCIATION,
J. D. A. MORROW, *General Secretary*.

MR. KRUTTSCHNITT ON THE RATE OF DEPRECIATION

WASHINGTON, D. C.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

On page 1037 of your number of December 7, the following paragraph appears, in an article on "Depreciation" written by Mr. G. C. Hand:

"Presuming the average life of ties to be 10 years, for example, the combined life remaining unexpired in each series of that number will, upon the lapse of a few years, be the quotient of 9 plus 1, or of 10 plus 0, divided by 2; and depreciation will amount to 50 per cent of cost, less the value of scrap material recovered. The salvage of ties is a negative quantity."

The theory implied in the above, as we understand it, is that of the Division of Valuation of the Interstate Commerce Commission, is erroneous, and would result, if not refuted, in unjustly depriving shareholders of \$552,795,200 of capital invested in the railroads of the United States, being half the estimated present reproduction cost of the ties in 394,944 miles of tracks of all kinds. The error lies in confusing the maximum life of a single tie with the average life of a number of ties, and in ignoring the effect of replacements. If one tie has a maximum life of ten years—not an average life, as one tie cannot have an average life—the average life in an aggregation of such ties, of various ages, ranging from ten to zero, as assumed in the example, is 10 plus 0 or 9 plus 1, divided by 2, or 5; but if the average life of an aggregation of ties is ten years, the lives of the individual ties will range from zero to perhaps as much as 20 years, because the meaning of average implies various lengths of life bound together by the law that the sum of the lives of all individuals divided by the number shall equal ten. A picture of the life-expectancies of a group of ten ties will resemble this series:

Life Expectancy

Condition per cent of each tie in terms of *Average Life*—10 years—thus:
5 30 50 70 90 110 130 150 170 195 per cent of ten. Aggregate = 1000

Average condition per cent of group:
 $\frac{1000}{10} = 100$ per cent of 10, or 10 years

Condition per cent of each tie in terms of *Maximum Life*—20 years—thus:
2.5 15 25 35 45 55 65 75 85 97.5 per cent of 20. Aggregate = 500

Average condition per cent of group:
 $\frac{500}{10} = 50$ per cent of 20, or 10 years

In other words, we reach the conclusion that 100 per cent of 10 is equal to 50 per cent of 20, as it should be. The paragraph quoted should therefore read:

"Presuming the average life of ties to be ten years, for example, the combined life remaining unexpired in each series of that number will, upon the lapse of a few years, be the quotient of 19 plus 1, or 20 plus 0 divided by 2, and depreciation will be zero."

In other words, the average life of a number of ties of various ages can be ten, only if the lives of individual ties range from 0 to 20, and the lives can range from 0 to 20 only if

ties are currently renewed as their lives end, for otherwise the ages of all would be the same. The answers to the following two questions should make the matter clear:

Question 1. What kind of ties are used in construction and repairs by the ——— R. R.? Answer: Ties whose lives range from zero to as much as 20 years, but which under our traffic and climatic conditions will last on the average 10 years.

Question 2. What kind of ties will be found in the track of the ——— R. R., which makes renewals currently as the necessity therefor becomes apparent? Answer: Ties whose lives range from zero to 20 years, but which under our traffic and climatic conditions last on the average 10 years.

As the answers are identical, the average life of ties as found at any time in a properly maintained track is the average life of the class of ties used.

J. KRUTTSCHNITT,
Chairman Southern Pacific Company.

PERISHABLE TERMINALS

WASHINGTON, D. C.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Time was when demurrage officers asked the question, "What is the test of a car shortage—the shipper's demands or the market's needs?" In so far as concerns the perishable products of the country it is neither the one nor the other. Perishables must move to market when they are ready to harvest. Not always is the market prepared to absorb them on arrival. They must be stored pending the readiness of the market to absorb them; else there will be financial loss to the producer, and possibly waste of food-stuffs.

Cars are not the places where they should be stored. But they will have to continue to be stored in cars until other storage space is available. It has for some time been evident to close students of the problems of intra-city distribution of foodstuffs that other storage space ought to be provided in each city in connection with joint wholesale perishable terminals to which all the rail carriers serving a given city shall have access on equal terms. The leading part which the railroads are called upon to take in bringing about conditions of this kind is to merge their competitive activities with respect to terminal delivery, and to agree to use a common neutral terminal.

Until that point is reached in the provisioning of our large cities, little headway will be made in securing by moral suasion the co-operation of shippers and receivers in the more efficient use of cars by releasing them promptly at terminal markets. A perishable terminal equipped with ample storage space, common and cold, will permit cars to be unloaded as soon as they reach the market, and to be returned to points of production.

It is idle to assert that present conditions will disappear with the close of the war. The war has merely accentuated and made very general difficulties hitherto sporadic, but for some time clearly on the increase. It has brought suddenly to the attention of the entire country the urgent need of changing some of our transportation and marketing practices to conform to changed economic conditions.

Transportation men seek higher demurrage rates to force the release of cars, but proper distinction is not made between perishable and nonperishable commodities. The arguments against increased demurrage charges by shippers of nonperishable commodities have not been very convincing, nor, in the long run, would any demurrage charge, however drastic, be a serious handicap to nonperishable traffic.

Perishable commodities, on the other hand, especially those moving under refrigeration, present a case quite different, especially in view of the necessity for their concen-

tration at one central point for the purpose of wholesale marketing. Instances are not wanting of concessions in the matter of free time and use of cars granted in the past by individual railroads in an effort to monopolize the perishable traffic of certain cities. Criticism now of practices not then improper is neither in order nor helpful. Doubtless, had transportation officials then been able to foresee the results now of their concessions, the present problem would be different and less difficult.

It does not appear that present demurrage rates, considering the country as a whole, are a handicap to perishable commerce. Nor do they force the release of refrigerator cars. To impose a rate that in all cases would force the immediate release of cars without providing other storage space would be uneconomical.

The United States Department of Agriculture has co-operated with the Commission on Car Service the past year by continually urging receivers of perishable commodities to unload and release cars promptly. As cold weather approached, shippers in the West pleaded for refrigerator cars to save apples and potatoes from freezing. The railroads, unable to fill orders for cars, at the same time begged the department to use its influence to secure the release of thousands of cars held in eastern markets under load. Slow progress was made, and the department's marketing experts at that particular time could detect no indication that receivers were holding cars under load for the purpose of manipulating prices.

The markets simply were saturated and lacking in temporary storage space. To have forced the accumulated products on the market would have meant loss to producers and distributors and waste of foodstuffs.

The department, through the columns of the *Railway Age Gazette*, desires to present this problem to the transportation officers of the entire country and to solicit their co-operation in making an early beginning of its solution.

G. C. WHITE,

Specialist in Charge of Transportation, Bureau of Markets,
U. S. Department of Agriculture.

A REPRESENTATIVE COMMISSION

NEW ALBANY, IND.

EDITOR OF THE RAILWAY AGE GAZETTE:

In view of the recent utterances of Frank A. Vanderlip relative to the need of a reorganization of the present methods of controlling transportation companies and the national interest which his remarks have apparently occasioned, I am sending you herewith a copy of a letter, which, with one or two minor changes and additions, is the same as one mailed you early this year, and which you published under Letters to the Editor in the issue of March 2, 1917.

In that letter I suggested that the President should appoint to the Interstate Commerce Commission one representative of the people from each of five districts, and that the transportation companies should select another representative from each district, the 10 members thus chosen to select a chairman, all to be subject to confirmation by the Senate. It was also suggested that the powers of this body should be almost plenary over all common carriers of any kind that originate freight or passenger traffic in interstate business, whether they operate wholly or partly in any one state, and that their decisions should be subject only to adverse decisions of the Supreme Court. In order to eliminate the confusion and injustice that now exist on account of the acts of various state and civic bodies, they should be eliminated or made entirely within the jurisdiction of the interstate body. But, in order that each state may have its individual needs taken care of, the governor of each state should appoint a representative of his state before the interstate body, such appointment being subjected to ratification

by the governing or legislative body of that state, and such appointees forming, perhaps, a lower body of the interstate body.

Referring to Mr. Vanderlip's statement, he says in part, "Upon the central board I would put representatives of the government, members of the Interstate Commerce Commission, representatives of labor, and representatives of the public, the investor." The representation of labor on such a board is an excellent idea, but would it be fair not to include representation of the transportation companies themselves; since, as the Chicago Tribune points out, the public, or investor, as used in Mr. Vanderlip's suggestion includes the direct and indirect interest of half of the nation; and therefore could not be easily considered as having direct reference to the incorporated bodies actually operating transportation facilities. Such corporations would naturally have more knowledge of their needs and requirements than any one not directly interested.

And may I ask, why it appears necessary to distinguish between the government, which is the servant of the public, and the public; or between the government and the Interstate Commerce Commission, which is apparently a part of the government?

And does it not appear that the addition of another governing body would prove superfluous and burdensome, and that it would be better to accomplish the desired end by simplifying instead of adding to the methods now used to attain that end?

Would you not, therefore, consider that the solution of the problem lies somewhere between the plan suggested by Mr. Vanderlip and the plan outlined in the letter above referred to?

C. E. NEWELL.

THE UPPER BERTH PROBLEM

SAN FRANCISCO, CAL.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

May I say a word for the Pullman Company in connection with the letter reproduced on page 679 of your issue of October 19, 1917? I, too, have been traveling in Pullman cars for a great many years, and therefore am quite familiar with the accommodations provided in upper and lower berths and compartments and drawing rooms. As I see it, the Pullman Company is improving its accommodations for the traveling public, the same as railway equipment, motor cars, building operations, and all other things in this human existence improve as time goes by. If this is a fact, then "a Pullman friend" surely must have noticed that in all late pattern Pullman cars a small electric light partly concealed is provided at both ends of the aisles in open cars, but in such way that passengers will not be annoyed by these lights after they retire.

Another point is the fact that the Pullman Company undoubtedly has issued instructions to its conductors and porters regarding the switching off of lights after specified hours. Of course, it is very difficult to satisfy all passengers who travel in Pullman cars, since many of them wish to retire early, while others desire to remain up more than half the night. In view of this I think most observing travelers will admit that the Pullman Company and its representatives do everything they possibly can to satisfy the greatest number of passengers.

It seems to me that the fact that upper berths are now sold for less than is charged for lower berths is a clear indication that they are not regarded as desirable as the lower berths, although we all admit that the beds of the upper berths are more comfortable than in the lower berths when once you get undressed and under the covers.

G. H. CORSE, JR.

Foreign Passenger Agent, Union Pacific System.

The British Railways Under Government Control

Many of the Railway Problems Great Britain Has Solved
Were Like Those We Are Now Trying to Solve

By F. A. McKenzie

THE following account of the operation of the British railways under the control of the government during war times is especially interesting at this time when President Wilson has recommended a similar policy for the operation of the railways of the United States:

British railways have played a great and splendid part in the war. Working with depleted staffs under war conditions, they have enabled England to move millions of men and millions of tons of munitions with the utmost rapidity and with an entire absence of confusion. They have met to the full every demand. They have sent their trained workers to the colors by the many score of thousands. They have torn up their lines and given their locomotives and rolling stock for the service of the army in France. Sinking ancient rivalries, they have come together, working as one for the common good. The government took control of the lines when hostilities began, but government control merely provided the agency through which the railway men themselves rallied to employ their resources as an effective instrument of war.

COMMERCIAL VS. WAR RAILROADS

The British and German railway organizations before the war presented a striking contrast. German railways were almost wholly state owned. Many of them were built primarily for purposes not of commerce, but of strategy.

The British railways were privately owned and were built solely for commercial purposes. The control of the principal lines was divided among forty companies. These maintained only a minimum of co-operation among themselves, and wherever they ran through the same territory there was keen rivalry. British lines were laid, the size of railway carriages and goods trucks decided and the staffs selected solely for the ordinary work of peace time.

One thing, however, had been done, a thing that was to prove of vital importance when war broke out. In 1871, following the Franco-Prussian conflict, the British government took power by act of Parliament to acquire by royal proclamation any or all of the railways of the United Kingdom in time of war. A committee of railway managers was already in existence to deal with such a situation. This body, known first as the War Railway Council and afterward as the Railway Executive Committee, was to act as a central organization, to give instructions and to co-ordinate the activities of the different railways in war time. Working in co-operation with it was the Engineer and Railway Staff Corps—a volunteer organization of railway workers whose purpose was to develop schemes, methods and personnel for the War Railway Service. It was composed of general managers of the leading railways, leading contractors, engineers and other railway men.

Month by month and year by year the Staff Corps worked out schemes for the utilization of our lines under any contingency. It planned how to carry out great movements of troops from one part to the other. Few, if any, then contemplated more than handling bodies of men running into a total figure of from four to five hundred thousand. When, later, the needs of the war raised the total to ten times the old maximum the plans proved to have been so soundly laid that the greater demands were easily met.

THE MANNING OF GOVERNMENT CONTROL

The Railway Executive Committee and the Railway Staff Corps, working in conjunction with the Director General of

Military Transport, gradually completed, during the years preceding the war, their plans of operation. These covered more especially the movements of a British expeditionary force to its embarkation port, the quick concentration of men at any point to repel an invading army, and the evacuation of invaded districts. By 1912 all was in readiness. Every railway manager had in his safe a confidential, sealed, unopened document, detailing a scheme of mobilization. In it he was told exactly what to do, the trains to be moved, their starting points and destinations, and the entire schedule of running, if war came. So far as the operation of our railways was concerned England was prepared.

On the same day that war was declared (August 4, 1914) the railways of England, Wales and Scotland—not Ireland—were taken over by the government. The managers opened their sealed instructions and proceeded to carry them out. It had been provided in the act of 1871 that full compensation should be paid to the owners for any loss incurred. The government, however, did not at the beginning announce any terms with the companies. This was left for a later date. Government control, it is important to note, did not mean government ownership. The lines remained the property of the companies. They retained the management of their own concerns, subject to the instructions of the executive committee, and the whole machinery of administration went on as before. The sole purpose at the beginning was to facilitate the movements of troops. But as the war developed, as economy became more and more essential, the scope of the Railway Executive Committee, now in supreme control, became greatly extended.

The official chairman of the Railway Executive Committee was the President of the Board of Trade, but the real presiding chief was the acting chairman. Working in co-operation with the acting chairman were 12 general managers of leading British lines. Under the central body were groups of committees, each made up of railway experts. The War Office and the Director General of Transport were in touch with the Central Committee. There was a constant interchange of ideas, but from the beginning there was no attempt to supersede the railway men in carrying out their work.

The main plans of the war policy of the railways had, of course, to be approved by the government, and announcements were made in the name of the President of the Board of Trade. But the plan uniformly adopted was for the authorities to tell the Railway Executive Committee what had to be done and then to leave it to plan the details of how the work should be completed. In other words, the experts were allowed to carry out their own work in their own way, so far as was possible, under war time conditions. And they got the thing done.

SEVENTY-THREE TRAINS IN FOURTEEN HOURS

The first task before the committee was one calculated to tax its resources to the full. The Territorials—the volunteer forces of the United Kingdom—had been called to the colors and had to be distributed to their training grounds and their defence areas all over the country. Simultaneously the Expeditionary Force, numbering 120,000 men, with a vast amount of material of war, had to be transported in a minimum of time to Southampton—the port of embarkation for France.

The government gave the railways a time limit of 60 hours to make ready for despatch to Southampton 350 trains of

about 30 vehicles each. In addition, close on 1,200 other trains were necessary for conveying the equipment, munitions and food supplies of the forces. There were about 60,000 horses to be carried—seven to a truck; there were 5,000 tons of baggage and 6,000 vehicles. Sir Herbert Walker, over whose system—the London & Southwestern Railway—the trains had to travel to Southampton, described what was done in a speech shortly afterward at the American Luncheon Club in London. He told of the government time limit of 60 hours:

We "delivered the goods," as you Americans would say, in 48 hours. At Southampton, for practically every day of the first three weeks of the war, we handled during a period of 14 hours no fewer than 73 of these trains, including the running of them to the boat side and the unloading of the full equipment of guns, ammunition and horses.

The trains arrived at intervals averaging 12 minutes. It was a matter of special pride to all the railway men concerned—and we general managers give credit for the feat to the efficiency of our disciplined staffs—that practically every train without exception came in on scheduled time. Some of them came from remote parts of the kingdom—Wales and the north of Scotland.

Among the audience on that occasion was Mr. (afterward Lieutenant Colonel) H. W. Thornton, general manager of the Great Eastern Railway, a distinguished American railway organizer, who had come to England from the United States. He said that so far as his knowledge of great transportation achievements went there was no event in railway history to compare with what the British lines had accomplished in that month of August, 1914. Certainly in America, the land of "big stunts," there had never been anything like it. It may be added that this rapid transportation of the troops to Southampton was only possible because the docks there had been carefully planned by the railway company for the handling of large masses of men and quantities of material. The trains conveying the troops and freight were run right down to one of the berthing stations; they were emptied there with the greatest expedition and at once sent back. Each train had a permanently displayed index number on it, by which it was known throughout its journeys; its exact time of arrival and departure at each place was scheduled, and the schedule had to be kept.

Under the terms on which the railways were taken over for the period of the war the government guaranteed to the proprietors of the railways that their net revenue should be the same as in 1913, except when the net receipts for the first half of 1914 were less than the first half of 1913; in that case the sum payable was to be reduced in the same proportion. The entire government traffic—men and freight—was to be carried without any direct charge being made for it or any accounts rendered. This plan was considered satisfactory by both sides. In the majority of cases there had been a reduction of earnings in the first half of 1914 over the previous half year, and companies were contemplating a still further reduction. The interests of their shareholders being assured, they were able to devote themselves to the work of economical and efficient distribution, quite apart from the usual financial problems. The one weak side of this agreement was that it made no allowance to cover increased interest payments on account of new investments and new capital expenditure since the war began. This point was afterward met by an arrangement that the government should pay interest at 4 per cent. on all new capital invested by the railways since August 4, 1914, on new lines, branches, terminals, equipment or other facilities put into use since January 1, 1913.

The conclusion of the financial agreement between the government and the companies automatically brought about a great economy in the system of railway accounts. Hundreds of clerks had been employed at the Railway Clearing House

at Euston, London, in dissecting payments covering different lines, so that each line should have its proper share. This work was no longer required. The vast amount of competition maintained before the war for traffic at once ceased. British railways, particularly those competing with others for the business of particular towns, had maintained staffs of canvassers not only for freight but even for passenger traffic. All the great companies had extensive publicity departments, which by posters, pamphlets and newspaper articles sought to bring home to people generally the attractions of their lines. In the years before the war this publicity had tended to grow more and more elaborate and more and more costly. Now it was swept away at a stroke. The weekly traffic returns of the different lines were no longer required and so ceased to be published.

The reports of the companies were cut down to a bare minimum, and in many cases even these reduced reports were not sent to the shareholders unless they specially asked for them. The tickets issued by various companies for the same points were made for a time available by the trains of any railway running between the points to which the tickets were issued. This concession was shortly afterward withdrawn.

The great strain of the despatch of the first expeditionary force passed, but it soon became clear that the railways would be faced by a double problem. They would all the time have a vast amount of military traffic to handle—the transference of troops, the carriage of munitions, the assembling of different sections of war material. Simultaneously with this great increase of work, they had a very serious reduction of staff. A number of railway men had been called up at once as army reservists and territorials, while many others volunteered to join the colors. It was estimated a few months after the outbreak of war that 66,000 men, out of a total of 643,135, had joined the army. This figure rapidly grew, until at the end of 1916 nearly 150,000 men had been released by the railways for war duty—close on to 50 per cent. of the men of military age. This shortage of labor quickly grew into one of the most serious issues. The companies had no desire to keep back recruits from the army, but they realized that it was essential for the welfare of the nation that the railways should be maintained in an efficient manner and be prepared to meet any military demands which might be placed on them. The King, in a message to the skilled workers in the shipbuilding and armament firms, emphasized this latter point in words that applied equally to railway workers: "His Majesty greatly admires that spirit of patriotism which arouses in them (the skilled workmen) the desire to enlist and fight at the front, but His Majesty wishes to remind them that by work that they alone can most successfully carry out they are assisting in the prosecution of the war equally with their comrades serving by land or sea."

At the time of the outbreak of war the railway companies and the men's unions—the National Union of Railwaymen and the Associated Society of Locomotive Engineers and Firemen—were engaged in a controversy on the question of wages. A railway conciliation scheme drafted by a Royal Commission had come into operation early in 1912. This was to continue until November 6, 1914, but either side could terminate it on or after that date by twelve months' notice. The men had given notice in November, 1913, to withdraw; they wanted the conditions revised. When war broke out the negotiations between both sides were in a very forward state. A temporary arrangement was arrived at in October, 1914, by which the conciliation scheme was to be continued, but to be terminable by either side at six weeks' notice. Many railway employees were convinced that since the government was now virtually in control of their lines their demands for increased wages should be met. The rapid rise in the cost of living had made it obvious, after a time, that something must be done. The railway companies felt that, from their point of view, any rise in wages, even though wholly or mainly

made by the government, might have the serious result of putting on them a heavy burden to be borne after the war and after private ownership was resumed. It is always difficult to reduce wages, whatever the conditions may have been under which they are raised.

On February 13, 1915, terms of settlement were arranged. A weekly bonus was to be paid to all wage-earning employees of eighteen years old and upward engaged in the manipulation of traffic; all whose standard rate of wages was under 30s. a week were to receive a weekly bonus of 3s., and those earning 30s. or more were to be paid 2s. The cost of this bonus was divided, one-quarter being paid by the companies and three-quarters by the government. Modifications of the original agreement between the government and the railway companies were made in order that this might be done. This agreement was revised afterward in 1915, and in its final form all employees of 18 years or upward were given a bonus of 5s. per week, those under 18 of 2s. 6d. The understanding at the time was that this arrangement was finally to settle the wage question until the end of the war. A definite undertaking was given on that point by the men's organizations: the National Union of Railway Men and the Associated Society of Locomotive Engineers and Firemen undertake that during the pendency of this agreement they will not present to the railway companies any fresh demands for increased bonus or wages, or general alterations in conditions of service, and that they will not give countenance or support either to a demand on the part of any of their members to reopen the settlement now made or any strike that might be entered upon in furtherance of such demand.

FURTHER WAGE INCREASES MADE

Here, however, war conditions proved a stronger factor than formal agreements. The cost of living generally, and particularly the cost of food, continued to mount up. A second war bonus of 5 shillings was added to the first, coming into force in September, 1916, and in April, 1917, a further agreement was come to between the Railway Executive Committee and the various trade unions of the men by which the war bonus was increased to 15 shillings per week for all employees over 18 and 7 shillings 6 pence per week for those below that age. It was estimated that the total additional expenditure on account of the war bonus would be £23,000,000. The whole of these latter increases were borne by the government.

These rapid rises in the wages paid to the men came in for much criticism. It was pointed out that the increase of 1916 was nearly equal to wiping out the dividends on the ordinary stock. The Railway Magazine declared: "Under no other system but state control would a war bonus be paid on an all-around basis alike to lads of 18 years of age and the oldest employee, and single and married men placed on the same plane, no matter what may be their financial responsibilities or comparative wages." But here certain considerations have to be borne in mind. This rise in wages was not peculiar to the railways, but was general in industry. The railway men under the war labor regulations were not to leave their employment for other work. It was felt that they could not reasonably be expected to continue under far lower wages than other men in allied industries in the same districts. Above all, there was the outstanding fact that the old scale of wages was inadequate under war prices. The average cost of food of the kind mainly purchased by working men had doubled; clothing was much dearer; all the incidental expenses of living, except rent and rates had gone up; and men could not maintain their families decently on the old wage scale. The idea of making the rise the same for all ranks was to benefit most those who needed it most—the lowest paid men.

No statements have been issued showing the final balance sheet of the railways under government administration, and any such statement would be very difficult to make out, since

a vast quantity of government traffic not credited under the war arrangements would have to be charged up in attempting to make any fair balance sheet.

In December, 1916, Mr. Bonar Law, speaking officially in the House of Commons, said that the government agreement with the railway companies, notwithstanding the grant of the war bonus to railway employees, had "involved no financial loss, but probably some gain." When we contrast the working of the railways under government supervision with the working of the British shipping independently, the gains of the government control become evident. The railways under government direction kept freights even, directed their operations on an organized plan, gave undue profits to no man, and were worked for the sole purpose of benefiting the country. The merchant shipping trade, left largely under private control, was used in many directions for the accumulation of individual fortunes—fortunes earned out of the necessities of the community.

The era of economy in administration extended. At first the railway companies, believing that the war would possibly be short, attempted to carry on as usual, to maintain as many of their ordinary services as they could, and to give the public all the facilities to which they had been accustomed in days of peace. After a time it became evident that this course was impossible. Step by step restrictions came in force. Restaurant and sleeping car services were cut down or suspended altogether. Excursion and week-end tickets, formerly a very prominent feature in British railways, ceased. The service of passenger trains was reduced. Minor stations were closed and some branch lines were abandoned. The "luggage in advance" system, by which passengers could send their luggage on a small payment before they themselves left and have it delivered by the railway company to their destination, was ended, and passengers were asked to take as little baggage as possible. Later on passenger baggage was definitely limited to 100 lb. per head.

FURTHER BENEFITS OF THE "POOL"

Among the most important economies in handling traffic was, first, the establishment of the common user of railway companies' open goods wagons. Under the old system the wagon received loaded by one company from another had to be promptly returned to the owning line, even though there was no freight for it on its return. Under the common user arrangement it became available for loading in any direction, thus reducing the haulage of empty vehicles to a minimum. This system of pooling luggage cars came into force on January 2, 1917. The pool did not include the very large number of privately owned wagons, estimated from 600,000 to 700,000, which are a distinct feature of British railways; but the benefits of the pool were soon seen to be so real that steps were pushed forward to take over the control of the private wagons also.

A minor economy introduced early in the war was an agreement by the railways to accept each other's "paid" and "to pay" stamps and labels on parcel traffic. This saved very much labor, and it led to a further development in January, 1917, when the Railway Executive Committee announced that from a given date "the carriage charges for all descriptions of traffic for conveyance by passenger train or other similar service must be paid by the sender at the forwarding station." The whole system of bills and accounts for passenger goods traffic was swept away. Some reformers even proposed that the railways should go further and insist upon the prepayment of all small traffic by goods trains. Still another step was a decision that claimants for the loss or damage of goods traffic should be dealt with by the company on which the claim was made without any division, such as had formerly taken place, of the amount paid between the companies concerned in the route over which the traffic had been conveyed.

The saving in printed matter was so extensive that at least one large company was able to turn out many tons of paper which had been stored for office use, and to put this on the market at a time when paper was scarcest.

In January, 1917, in addition to the changes already described, passenger rates were raised 50 per cent, and Irish railways, which had formerly been outside the government control, were taken into it. The rise in passenger rates was instituted not to increase revenue, but to reduce the amount of traveling. The British authorities openly appealed to the people not to travel except when necessary. It was urged on the public in every way possible that pleasure traveling under existing conditions was unpatriotic. The railway men were wanted for other work.

TRANSPORTING STOCK TO THE WAR ZONE

Late in 1916 a fresh consideration came to the fore. In the early stages of the war the British had relied mainly for the transport of their goods in France on the service of large numbers of powerful motor wagons. Experience proved that while a motor service might answer as a temporary measure for a comparatively small body of men, it was impossible to provide for very large armies by road traffic. It was particularly impossible to bring forward with sufficient rapidity the enormous quantities of shells required and the numerous heavy guns without the use of properly built railroads. The companies could not well manufacture afresh the rails, locomotives and rolling stock necessary, or educate outside men to operate them in France. To meet this situation large sections of line were torn up in England and sent over to France, and every spare locomotive and spare bit of rolling stock was also sent over. These rails were quickly laid down by the Railroad Construction Corps, drawn largely from railroad builders from the Dominion of Canada. The new lines were operated by the Railroad Corps, recruited from practical British railway men. This of necessity still further reduced traveling facilities in England.

Still further economies were necessary. The men organizing the railway services of the country ever kept in mind the purpose of effecting these economies with the minimum of inconvenience to the public. In July, 1917, an important scheme, going far beyond anything yet attempted, was announced for the coal trade. The carriage of coal was one of the big problems of the railways, for it involved much labor. In the winter of 1916-17, owing partly to delays in railway transit and partly to difficulties in local delivery, considerable numbers of people—particularly the poor—had been unable to obtain supplies of coal with any regularity. It was feared that conditions might be still worse in the approaching winter. This the authorities planned to prevent.

The Controller of Coal Mines published a scheme, dated July 4, 1917, for the purpose of reorganizing the transport of coal by railway for inland consumption. Under this scheme England, Wales and Scotland were divided out into twenty areas and each area had to take its supplies from certain fixed districts of production. It was estimated that the plan would effect a saving in railway transport of not less than 700 million ton miles annually. The scheme was based on four main issues.

(1) That consumption of coal should take place as near the producing point as possible.

(2) That in view of the superior facilities offered by the main traffic lines, the movement of traffic should follow these routes wherever possible.

(3) That the movement of coal should, as far as possible, be in well defined directions—north to south, north to south-east, north to southwest, east to west.

(4) That an area producing less coal than suffices for its own need should not send any portion of its output to other areas. That an area producing more coal than it requires for consumption within the area itself should only distribute

to adjacent or convenient areas. This scheme did not affect waterborne coal, anthracite or coke of any description.

It was the precursor of other schemes which were to reduce unnecessary traffic in goods to the minimum.

PROBLEMS TO COME AFTER THE WAR

The responsible men on our railways recognize that the problems in railway management and control raised by the war will not altogether come to an end when the war is over. A new era has begun in railway management, and it will be impossible to go back completely to pre-war conditions. Even if it were possible, it would be highly undesirable. While no definite schemes have yet been arranged, it can safely be foretold that there will be greater unity of administration when peace returns than in the old days before war came. Co-operation has proved to be better than cut-throat competition. In the old days the Railway Clearing House at Euston provided the machinery for a limited amount of co-operation, but one dissident could often hold up great reforms. The Railway Executive Committee of to-day is almost certain to develop into a permanent central body, which will act as the coherer, the organizer and the Supreme Court of Appeal among railways themselves when rival schemes threaten conflict. This central body will promote economy of effort. It will prevent extravagant and excessive competition, and it will, if wisely guided, hold the scales evenly between the triple claims of the railway proprietors, the railway employes and the general public.

The second problem is that of wages. Practical railway men maintain that under normal conditions it will be impossible to pay, when the companies emerge once more from government control, anything like the war bonus of 15 shillings per week per man now received. Any attempt to revert to the pre-war wages would probably plunge us into a labor war. What will be a fair and practical wage for the men after the war is over? How can it be paid? If a substantial increase on the pre-war rates is found necessary—as many think it will be—how are the companies to meet it? Are they to be allowed to maintain higher passenger rates or to increase freight charges? If so, will these higher charges mean increased revenue? It is an axiom of management that low fares mean heavy traffic. Here is a matter which will demand the most careful consideration of both railway managements and the men's leaders.

The third problem is that of the future of women's labor on the railways. The companies have promised that men who have left them to serve with the colors will be reinstated on their return in positions equal to those they left. That promise must be kept, and kept to the full. But, unfortunately, many of the men will never return. Women have been found such efficient railway servants that they are certain to be retained. Many branches of railway employment before the war exclusively held by men will, a few years hence, be wholly or almost wholly in women's hands. How can the change which has already taken place be made permanent without strife?

The changed conditions after the war may, of course, provide in themselves a solution for all these possible problems. In the great rush of work to be done when the world is to be repaired, when ruined countrysides are to be rebuilt, great cities re-equipped and the waste of war made good, there will be for a time at least a demand for labor greater even than the supply afforded by a gradually demobilized army. It has been the experience of other generations that a successful nation emerging triumphantly from a hard-fought war has in itself such springs of hope, enthusiasm and inspiration that the impossibilities of other days are tackled and overcome. The British railways may at least hope that, having solved the problems of war traffic and employment in unequalled fashion, they will master the lesser problems of the coming days of peace.

FREIGHT OPERATIONS FOR SIX MONTHS

The monthly report of freight operations of steam railways compiled by the Bureau of Railway Economics for the Railroads' War Board, shows an increase of 14 per cent in revenue ton miles for the six months April to September, inclusive, as compared with the corresponding six months of 1916. The total revenue ton miles handled amounted to 204,702,861,865, as compared with 179,586,351,511. This increase in traffic was handled with an increase of only 2.3 per cent in the number of freight cars in service and 13.9 per cent in the number of freight locomotives in service. Freight train miles increased 5.5 per cent, loaded freight car miles 4.4 per cent, and empty freight car miles 4.9 per cent. The tonnage per train was increased from 626 to 675, or 7.8 per cent, and the tonnage per loaded car from 24.8 to 27, an increase of 8.9 per cent. The average miles per locomotive per day increased from 65.8 to 68.7 and the average miles per car per day from 27.3 to 27.9. The percentage of empty car miles was nearly the same, 30.6 as compared with 30.4. The percentage of freight locomotives in shop or awaiting shop was reduced by 9.1 per

cent, and the percentage of freight cars in shop or awaiting shop was reduced by 7.8 per cent. These figures are for an operated mileage of 225,852.

During the month of September revenue ton miles increased 2.9 per cent, while the average number of freight cars in service increased 3.1 per cent and the average number of freight locomotives in service increased .9 per cent. The number of freight train miles during the month increased .1 per cent and the number of loaded freight car miles decreased 2.9 per cent, while the empty freight car mileage increased 3.8 per cent. The revenue ton miles amounted to 31,500,299,936 as compared with 30,604,074,564 in September, 1916.

SPECIAL COUNCIL FOR IRISH RAILWAYMEN.—At the present time all the Irish business of the National Union of Railwaymen is dealt with from the headquarters in London, assisted by an organizer in Dublin. To meet the disadvantages of this arrangement the executive of the union has decided to establish an Irish council, which will have authority to deal with all applications for increased wages and improved conditions of service on the railways of Ireland.



Soldiers Unloading Light Railway Sections for a Line in Belgium. Notice How the Sections Are Complete, Ties and All



When German Prisoners Are Available, They Put Them on the Job. Each German Is Marked "P. G.," Meaning Prisonnier de Guerre



Pictures French-Official from Pictorial Press, New York.

The Light Railway Hauling Supplies on the Meuse

Railroad Views on the Valuation Act

Roads Reply to Director Prouty's Memorandum. Contend Act Requires Ascertainment of Final Value

PIERCE BUTLER and Leslie Craven, counsel for the Texas Midland, have filed with the Interstate Commerce Commission a special reply, in the form of notes and comments, to the memorandum recently filed by Director Prouty in the Texas Midland valuation case, with a note stating that it had not been submitted to or considered by the President's Conference Committee and was not filed in its behalf. An abstract of the director's memorandum was published in the *Railway Age Gazette* of October 5, page 599. An abstract of the reply, which discussed some of the principal questions raised in connection with the valuation proceedings, is as follows:

SHALL VALUE BE FOUND?

The director's memorandum, while professing to rely upon the contention in the solicitor's brief that the act does not require the commission to ascertain or report value at all and that it is impossible to fix ultimate value except for a particular purpose, strongly supports our contention to the contrary. The director there says that he, as a member of this commission, several times joined in recommending to the Congress that it should provide for a valuation of railroad property and that in so doing he understood that a valuation in dollars of the property as a whole was called for; that there can be little doubt that a majority of the members of the Congress which enacted this measure understood that it provided for a statement of the value of the properties dealt with in money, and that the act was so accepted by the country at large. No one can reasonably contend that the language of the act is not plain upon the point. The director suggests that ultimate value for rate making purposes should be stated, and that the full benefit of this valuation cannot be realized unless this be done; that uncertainty is the vice of the railroad situation today; that, if the present system of providing public service by private capital is to be continued, some way must be found to assure that capital of the treatment it will receive, and that he does not know how this can be done until the value of the property now devoted to that service has been determined.

Particular purposes, among others, for which the valuations required to be made by this act are by the act specifically declared. The solicitor's contention that it is impossible to find value, except for a particular purpose, ignores the fact that by the plain language of the act it is contemplated that the valuations may be used in numerous cases and for many purposes.

The adoption of the solicitor's views would deprive the railroads and the public of the advantages which the commission by various recommendations from 1888 to 1912 intended to secure, which the Congress plainly granted, which the public understood would result from the passage of this act, and it would continue the great vice of uncertainty mentioned by the director.

The director's memorandum in substance agrees with the contention of the Texas Midland that its property is not typical of the railroads of the country and that it should not be taken as a test case. As far as we know, the same may be said of the Norfolk Southern, Atlanta, Birmingham & Atlantic, New Orleans, Texas & Mexico, and Los Angeles & Salt Lake. The important principles involved should not be settled upon the facts included in the tentative valuation in this case. We have so contended from the first, and are gratified to find that the director in substance agrees.

Without citation of authority it is said:

"* * * It (value) has been described by the courts and is that sum upon which under all the circumstances and upon a fair consideration of all the facts and elements to be taken into account a fair return should be permitted."

The failure of the director to cite the language of the courts or the cases from which his description of value is derived is regretted. Is this description sufficiently definite to mean anything? What facts are to be considered? Would not this description apply as well in a condemnation case as in a confiscation case? How, if at all, is the value here described to be distinguished from value in its true economic sense? The director cannot mean that any sum that happens to be so fixed by any commission as a rate base is therefore the value. Does not "fair return" as used in his description mean "just compensation" as used in the fifth amendment to the federal constitution? Is not that clause, so far as federal action is concerned, and the equal protection and due process clauses of the fourteenth amendment, so far as state action is concerned, the source of power of the courts to restrain and set aside laws and orders prescribing confiscatory rates, i. e., rates which take property of the carriers without "just compensation"? Is not "just compensation" for property taken for public purposes the value thereof? Is not a reasonable return upon that value "just compensation" in rate fixing or other price fixing cases? As stated by Mr. Justice Lamar (233 U. S., 389): "The fixing of the price for the use of private property is as much a taking as though the fee itself had been condemned for a lump sum * * *." That contemporaneously the value of the same railroad property is the same in a rate confiscation case as in a condemnation case is clearly established by the decisions of the United States Supreme Court.

CLEARING AND GRUBBING

It is reasonable to assume that, in the ascertainment of the cost of reproduction, the existing property should be the basis, and that grading quantities in reproduction should be the actual quantities involved in the construction of the property as it exists; that excavations and embankments should not be assumed to have been made in whole or in part in advance of the commencement of the work which forms the basis of reproduction; that stumps,—like stones and other formation,—which were in fact removed in order to make the excavations and embankments should be included at proper prices.

In ascertaining clearing and grubbing quantities, present conditions of adjacent and adjoining lands are assumed and thereby a part of the work which was actually done to build the railroad is eliminated. The present condition of adjacent and adjoining lands discloses thereon crops, fences, drains, buildings, etc. If these conditions be adopted, then cost of reproduction new must include the amounts of money which on valuation date would have to be paid by the carrier to cover damages sustained by the owner by reason of the taking of his crops, buildings, etc., in the acquisition of its lands, rights of way and terminals. It is not reasonable to assume as the basis of ascertaining cost of reproduction new that the lands, rights of way and terminals of the carrier would be unused and naked of planting, fences, drains, buildings, other improvements, etc. Yet, it appears to be so assumed, and the tentative valuation does not in any account contain a dollar to cover such damages or the cost of clearing and removing the same

from the right of way and lands of the carrier to make the same ready for railroad construction, use and maintenance.

The director's method is unjust. On the basis of *present conditions*, it excludes clearing and grubbing which was actually done. On the basis of *original conditions*, it excludes the present cost of crops, buildings and other improvements for which the carrier must pay to secure its right of way and terminal lands. *Ignoring both original and present conditions*, it excludes the cost of buildings which were in fact upon the land when acquired, or which, on the basis of present condition of adjacent and adjoining land, would on valuation date be upon the right of way and terminal lands.

If the tentative valuation includes anything whatever directly or indirectly for removing buildings from the right of way or terminal land either upon the basis of original conditions or upon the basis of present conditions, we have been unable to discover the same, and we doubt whether anyone in the division can point out the same, or indicate the amount thereof.

The methods suggested in the director's memorandum and which, so far as we can learn, were employed to make the tentative valuation in this case would exclude from the cost of reproduction of terminal facilities,—like the Pennsylvania and New York Central stations in New York, the Kansas City terminal, the Northwestern station in Chicago and the Union Depot in Chicago now being constructed—the sums actually paid for buildings on sites when acquired and the cost of destroying and removing the same. Present and original conditions are ignored. Contrary to fact and contrary to reasonable hypothesis, the ascertainment of reproduction cost is made upon the assumption that the lands, rights of way and terminals would be vacant, unused and cleared off in advance, all ready for construction.

INDUSTRY TRACKS

The tentative valuation in this case omits from the cost of reproduction new and cost of reproduction less depreciation many items of property which are owned or used by the carrier for its purposes as a common carrier. For example, there are omitted 14 miles of main line used by the Texas Midland jointly with the Cotton Belt under an agreement with that company which is the owner thereof subject to the right of the Texas Midland to use the same; passenger facilities at Paris; passenger facilities at Ennis; freight facilities at North Ennis. All of these are used by the Texas Midland in the service of the public under arrangement with other companies, the owners thereof, subject to the rights of the Texas Midland. There are omitted the lands upon which are located practically all of the industry tracks used by the Texas Midland in the service of the public; all telegraph property along the line of the railroad used by the company; materials and supplies; working capital, etc.

That these industrial tracks are *used* by the Texas Midland for railroad purposes cannot be denied. The fact that the railroad company does not own an indefeasible title to these lands, or, if it be a fact, that the owners of the land may terminate the use, is immaterial so far as the inclusion of the same in the inventory required by the valuation act is concerned. Absolute title is not acquired by eminent domain, but that makes no difference in value.

The suggestion to the effect that industrial track right of way land and improvements thereon should be excluded from reproduction cost upon the hypothesis that in reproduction the land will be furnished and the track constructed exactly as they were originally is without foundation and a violation of the act. The act requires that there shall be ascertained the cost of reproduction new in detail of each piece of property owned or used. It does not make any difference who paid for it or whether it was paid for at all.

There is no ground for excluding from the inventory donated right of way or terminal land, or grading, buildings or other improvements donated to the carrier by the public or by individuals as an inducement for the completion and operation of the railroad. The original cost and financial history report will disclose the facts as to the original expenditure. There must be reported the original cost, the cost of reproduction new and the cost of reproduction less depreciation of *the thing*, i. e., in detail as to each item of property, that is *owned or used* by the carrier for its purposes as such.

The suggestion that the *carrier* has not devoted such property to public use is without foundation. It is used by the carrier in the public service. The fact, if it be a fact, that some or all of the elements have been donated by individuals, municipalities, the state, or the nation cuts no figure. The act expressly provides for the inclusion of donated items together with the value thereof at the time of the gift and at the present time. This commission held in the *Car Spotting Case* that these tracks are terminals of the carrier. The carrier is bound to use them in the public service.

The rules laid down by the director are plainly in violation of the valuation act. This act requires the inventory to include in detail each piece of property *owned or used* by the carrier for its purposes as such. The director makes ownership the test. He reads the phrase "owned or used" as if it read "owned *and* used." Attempt is made to excuse or justify this disregard of the plain language of the act by the suggestion that the carrier has no such interest in the land as to make that the basis of a *claim for earnings*. But the basis of rates is not involved. Non-carrier property is required to be included in the valuation.

The director is inconsistent. He holds that the act does not require value to be found. He holds that the exact terms of the act as to inventory, reproduction cost, etc., must be followed. He then disregards the plain language of the act which requires each piece of *owned or used* property in detail to be included in the inventory and the reproduction cost thereof to be shown, and which provides that the present value in detail of all of the owned or used lands, *rights of way* and terminals must be ascertained and included.

All the attempted justifications or reasons for omitting industrial tracks rest upon the assumption that the sole purpose of the valuation act is to produce a figure called value for rate making. This assumption is contrary to the fact.

The director described value for a rate base to be "that sum upon which * * * a fair return should be permitted" He denies that this is the *value* of the property as value has always been understood by economists. He says that, as a member of the Interstate Commerce Commission in recommending that Congress provide for a valuation of railroad property, he understood "that a valuation in dollars of the property as a whole was called for"; that Congress "understood that it provided for a statement of the value of the properties dealt with in money," and that the act "was so accepted by the country at large." He now appears to distinguish between the value of the railroad property of the carrier as a whole and "an ultimate value for rate-making purposes." But the reports and recommendations of the commission in which he joined, set forth the reasons why the commission wanted the valuation which it recommended the Congress to provide for:

- (a) To obtain a trustworthy estimate of the relation existing between the present worth of railroad property and its cost to its proprietors;
- (b) In determining whether rates as fixed by the government are confiscatory;
- (c) In connection with railway taxation;
- (d) In the ascertainment of a proper depreciation reserve;

(e) In testing the accuracy of the balance sheets of the carriers;

(f) To the organization of railway statistics in general;

(g) In determining whether the railroads are under or over-capitalized.

The language of the act and its legislative history show that the purpose of valuation is not limited to rates. Value in rate confiscation cases is the same as in condemnation cases. There is no foundation for the assumption that value depends upon the purpose of the appraisal. Any such assumption would leave us without guide. It would substitute the personal conceptions of the appraiser as to right and wrong in each particular case for the well settled principles of law which guide the judicial determination of value.

Even if the sole purpose of the act were to produce a figure for rate making purposes, industrial tracks would have to be included. Governmental authority cannot compel a carrier to use property for the service of the public, and withhold just compensation because the utility has less than the full title or no title.

PROPERTY USED JOINTLY WITH OWNER

As to property used *jointly with the owner* the positions indicated by the director's memorandum may briefly be stated as follows:

(1) While holding that *value* is not required to be found, it is conceded that the proceedings under the valuation act are for the purposes of valuation, and that sometime this commission or some other tribunal may or can use the facts found and reported for the purposes of ascertaining the value of the property owned or used by every common carrier. "The purpose has been to *value* all common carrier railroad property once and but once."

(2) Property jointly owned by two or more railroad companies is inventoried in the valuation of each.

(3) Property owned by one railroad company and exclusively used by another is inventoried to the owner but it also appears in the inventory of the user.

(4) Property owned and used by one railroad company which by lease or other contract arrangement grants joint use to another is inventoried to the owner and classified as owned and used by the owner. Reference is made to the fact that it is used by the lessee but the valuation of the latter omits all consideration of the same.

Under the above stated rule (2), certain railroad facilities jointly owned and used by the Texas Midland and one or more other railroad companies is included in the inventory and the cost of reproduction new and cost of reproduction less depreciation is shown and ownership is shown. The cost figures are divided by the number of owners. The same facilities will in the same way be included in the inventories of each of the other owners. *The director does not claim that this involves any duplication.*

Under the last mentioned rule there have been excluded from the valuation of the Texas Midland 13.97 miles of the main line, a passenger station at Paris, a passenger station at Ennis, and certain freight terminals at Ennis. Each of these jointly used properties is covered by a lease from the owner to the Texas Midland, and that company has property rights to and ownership in each of the same and uses the same in the service of the public for its purposes as a common carrier.

The valuation act requires the commission to investigate, ascertain and report the value of all the property owned or used by every common carrier. It requires the commission to make an inventory which shall list the same in detail according to the prescribed classification of accounts. It requires as to each piece of property owned or used for carrier purposes that there shall be reported in detail the original cost to date, the cost of reproduction new and the

cost of reproduction less depreciation. It requires that there shall be reported the present value of the lands, *rights of way* and terminals owned or used by every common carrier for its purposes as a common carrier.

Each of the jointly used properties in question is admittedly used by the Texas Midland for carrier purposes and under the plain language of the law must be included in detail, in the inventory and valuation. When details are stated in one inventory inclusion in the other inventory or inventories may be made by reference.

We insist that a *reporting of the facts* involves no duplication. There is no more ground for claiming that the report we here insist upon would be a duplication than there is for claiming that the director's methods for the handling of jointly owned property and property owned by a railroad company but used exclusively by another involves duplication.

We insist that there is no reason why property used jointly with the owner should not in valuation be shown in the inventory in the same manner as the director indicates for the treatment of jointly owned property and property owned by one railroad company and used exclusively by another. *No duplication is, or would be, involved.* The extent of the use of each railroad jointly using such a facility can easily be determined. The extent of the use of the Texas Midland is admitted by written stipulation in this case as to each of these joint items. The director's point to the effect that it is not possible to define the extent of the use in such cases has no application here, and we think is without merit in any case. No additional expense will be involved. The property in question must be listed in detail, the cost figures must be shown. When this has been done and the figures have been included in one inventory reference thereto is all that is necessary in the inventories of other joint users.

APPRECIATION

Appreciation comes with the lapse of time and use. It is an increase in worth due to an intrinsic physical improvement over and above what the same property item or element would be if new. It may be produced by labor, or it may result from the work of nature, or both. It is found in the roadbed, embankments, slopes or other parts of the property. As we understand the director's memorandum on this subject he agrees with us. It is a part of his platform, reiterated in different forms and places, that the act requires a statement in some form of every fact which might have a bearing upon the final value of these properties.

The Texas Midland Railroad has at all times been properly maintained, and on valuation date it was in proper condition for the service it is required to perform. The evidence establishes the fact that appreciation existed on valuation date in a large amount. Upon the undisputed testimony of all witnesses it could not be less than \$61,000 and the evidence justifies a much higher amount. As it is admitted that appreciation exists and should be included, and, as there is no contradiction of this testimony, we insist that the same should be allowed.

Some of the causes from which appreciation results are set forth in the director's memorandum. For a long time after the construction of a railroad the grading and other items of the way are worth much less than the same would be in the solidified and stable condition which results by use, lapse of time and proper maintenance. During this period the cost of maintenance is excessive in comparison with what the same would be if appreciation had matured. Some of the appreciation results from the expenditure of money for labor, and some results from other causes. The excess work necessarily performed during the initial period is properly *deferred construction work* and the expense thereof properly should be charged to cost of road. But so

far as the ascertainment of the value of the property is concerned, it is immaterial to what account the charges for such labor have been made, or ought properly to be made; it makes no difference whether the improved condition and the enhancement of value result from the performance of labor or by the mere lapse of time and use. Every element of value must be included. It makes no difference whether the same was paid for at excessive, moderate or too low prices or at all; the source of the fund from which the payments were made is immaterial. If an element of value exists, it belongs to the carrier and must be included and reported. As stated by the director, the Congress intended " * * * to provide for the statement in some form of every fact which might have a bearing upon the final value of these properties." At the time of the passage of this act it had long been settled in valuation practice that the replacement method involved the ascertainment of the cost of reproduction plus appreciation, if any, and less depreciation, if any. As shown by the director the Supreme Court of the United States has said that appreciation should be added.

The director suggests that appreciation is due to the action of nature, not to any extent to what the carrier has done; that the efforts of the carrier have only replaced the depreciation, so to speak, upon the outside; that they have simply kept good the form of the property without having increased or improved it. It is suggested that under the present rules of the commission these expenditures are chargeable to operation and that they do not represent any addition to the property itself which is a capital charge. It is suggested that appreciation has not been produced by any act of the carrier and that it has not involved any expenditure of money upon the part of the carrier. It is suggested that the cost of appreciation, which was paid for, is contributed by the public.

We do not understand that the director makes the foregoing and other like suggestions in support of a contention that appreciation when found to exist should not be allowed. We do not understand that he claims that in this valuation a foundation should be laid for the omission of any property or element of value, either in rate cases or in condemnation cases. It is true that some elements of appreciation result from the action of nature and from the use of the railroad and that other elements of appreciation result from the expenditure of money in properly maintaining the railroad. The accounting rules of the commission do not relate to value. They merely prescribe the manner and form of keeping certain parts of the cost of railroad property, and cost (not value) is recorded whether such cost exceeds or is less than value. If, in order to obey the valuation act, it shall become necessary to modify the accounting or other rules of the commission, then they must be changed. If there shall be found any inconsistency between these rules and the act of Congress, the latter must prevail. Even if all the appreciation on an entire railroad system was paid for out of the earnings of a carrier, it belongs to the carrier and must be included in the valuation.

The testimony of the carriers introduced on the general subject of appreciation not only demonstrated—as is now conceded—that appreciation exists but it also points to a method which properly may be used as a guide to ascertain the amount thereof. The evidence showed a comparison of the labor cost of maintenance of a new line before the property had appreciated with the corresponding cost of lines of varying ages, some of which were forty years old. The nature of the problem does not permit determination with mathematical exactness. Doubtless, it is true that the value of such comparisons will vary as the lines compared differ in characteristics affecting the matter. The director's criticism is *verbally* true to the extent that the figures introduced by the carrier's witnesses do not measure with mathematical exactness the amount of existing depreciation,

but, if it be intended thereby to suggest that proof of that kind is not pertinent and may not be used as a guide to arrive at the truth, the criticism is without foundation and violates common sense and rules usually employed to ascertain value and other facts which are not capable of determination with arithmetical exactness, as pointed out by the language of the Supreme Court above quoted.

We agree with the statement of the director to the effect that it was the evident intention of the framers of this act to provide for the *statement in some form of every fact which might have a bearing upon the final value of these properties*, and that it was the plain intent that the condition of the property at the date of the valuation be shown. We insist that the reservation by the commission of the analysis of methods, required by paragraph "Second" of the act to be made and reported, until after conclusion of the final hearing on the carrier's protest is contrary to the plain provisions and intent of the act, and is without any justification whatsoever. In the absence of protest, the tentative valuation becomes final by the mere lapse of time. It follows that the tentative valuation should be in form and substance the same as the final valuation. No one has ever suggested a reason founded upon justice or convenience for withholding from the carrier the methods employed to ascertain the "costs" of its property. An orderly compliance with the act requires that methods be first adopted. They necessarily affect the result. The tentative report should be in such form as to furnish an opportunity for the carrier at final hearing to discuss the propriety of the methods employed by the commission in making the tentative valuation. The ultimate value conclusion depends upon evidentiary facts and findings which must be disclosed in detail. The final value required to be reported is not like a verdict of a jury concerning the manner of reaching which no inquiry is permitted; the act specifically requires full disclosure of facts, methods and reasons involved in reaching final value, and this is to furnish to the carrier and others the means by which the final conclusion may be tested.

We contend that the evidence which is uncontradicted abundantly sustains the claim of the Texas Midland that at least \$61,000 should be included on account of appreciation. If for any reason the commission shall be of opinion that the evidence, though uncontradicted, is not sufficiently specific and certain to enable the commission to find a definite sum, then there should be further investigation. This, as we understand, is in harmony with the suggestion of the director.

DEPRECIATION

In dealing with "Depreciation" in his memorandum, the director of valuation reaches the conclusion that such parts of the property as rails, ties and the like, even when maintained by proper renewals in a state of 100 per cent efficiency, must be regarded as being depreciated 50 per cent. Hence, in determining the capital invested as represented by the cost of reproduction less depreciation, one-half of the capital expended for such parts of a railroad property as the rails, ties, etc., must be deducted, leaving as the value of the property thus determined, that is, the amount upon which a fair return may be earned or the amount which must be paid in case the government takes the property, a sum equal to only one-half of the capital outlay for such rails, ties, etc. This means the loss to investors in railroad property of millions upon millions, admittedly a part of the capital actually and necessarily expended in the production of the property, and would have to be expended in its reproduction. The obvious injustice of such a result is sought to be justified or palliated on the assumption that at some time in the early history of the railroad, before this 50 per cent of the amount expended for these so-called perishable items had disappeared, the railroad received in earnings from the

shippers of this early period, not only enough to pay a return on the investment in such items and the expenses, including necessary replacements or renewals, but in addition enough to reimburse it for one-half of the capital outlay for such items. In other words, although these early shippers have properly been charged enough to make all necessary repairs and replacements, it is assumed that they also unjustly have been charged enough to return half the original investment in these items and consequently that present shippers should be required to pay a return on only one-half of this portion of the original investment. It would be interesting to know upon what reasoning the director reached the conclusion that it was necessary or proper for a railroad to compel past shippers to purchase, as it were, one-half of the slowly perishable portions of the property for the benefit of future shippers.

CONTINGENCIES

The conclusion of the director is that no general overhead charge should be made on account of contingencies, but that any allowance of that kind which ought to be made should be taken care of in connection with particular items. The particular items referred to in the memorandum apply: To buildings on account of contingencies or contractor's profit, or both; to cover that element of uncertainty which exists in every estimate; to work in connection with grading not embraced in the contract price; to changes of highway and construction of a ditch off the right of way, etc.; to damaged embankments after completion by the contractor and acceptance by the railroad.

The memorandum says, " * * * No allowance has been made for contingencies, as such, * * * in the tentative valuation of the Texas Midland * * *." The tentative valuation does not state that any allowance whatever has been made for contingencies. The methods employed are not disclosed by the tentative valuation in this respect. It does not appear from the tentative valuation or the evidence offered by the division how much, if anything, has been included in unit prices, or any item, to cover the element of contingencies. General statements have been made to the effect that while contingencies *as such* have not been allowed the same have been taken into account in unit prices. We insist,—and we understand the director has agreed with us upon this point,—that proper practice requires that it should be made plainly to appear whether or not anything whatever is allowed in any account to cover contingencies, and, if any allowance is made, the amount thereof should be disclosed. The methods employed must be reported. They should not now be withheld. Mr. Worley testified, that it is the valuation practice in estimating reproduction cost to allow for contingencies, and that the amounts so allowed range from 5 to 10 or even greater percentages. The director's memorandum in substance so admits. But, contrary to the established practice and the proof, the director recommends that no allowance for contingencies be made, excepting in the instances above referred to.

The Texas Midland,—as is the case with a majority of the railroads,—was constructed a number of years ago and the records of the construction work are incomplete. Because of this, as we understand, a survey and a re-measurement was decided to be necessary by the commission in order to ascertain reproduction cost. The question here involved is whether, as a practical matter, the quantities and character of the work involved in the roadbed and other important elements of the property can be determined with such accuracy that no allowances are necessary to cover the elements of uncertainty necessarily attending the work. A reproduction estimate based upon complete maps, profiles, original cross-sections, and construction records presents a case quite different from such an estimate based upon present inspection and a survey of the roadbed without the aid

of such records. The original ground surface cannot be determined with accuracy by mere field work, nor can the amount of subsidence of such surface or shrinkage of materials. The dimensions of masonry under ground are often unknown and the foundation features hidden. Concealed drainage and *many items of work* will be overlooked or not recognized as being a necessary part of the cost of building the railroad.

The director's conclusion rests upon mere assertion that government valuation engineers are able to find and do find 100 per cent of existing quantities, and can foresee and do in fact take into account, 100 per cent of the unknowable facts, conditions, difficulties, accidents, disasters, delays, and lack of co-ordination which necessarily attend the construction of every railroad. This is contrary to experience and established practice. State commissions, valuation engineers and appraisers of the greatest ability make appropriate overhead allowances to cover contingencies.

ENGINEERING

The director does not claim that the original cost of engineering of this property has been or can be shown. The tentative valuation reports that original cost to date cannot be found. When the railroad was built there was no prescribed classification of accounts. As we understand the director, he holds that the original cost to date of engineering, even if that could be shown with accuracy, should not control or measure the cost of engineering to be included in the cost of reproduction. The tentative valuation allows \$54,926 to cover engineering. This is about 2½ per cent of the road accounts excepting engineering and land. The railroad is relatively simple and cheap. It is generally conceded as true that in cases where construction is relatively inexpensive the *percentage* of engineering cost to the total of the road accounts, excepting engineering and land, should be relatively high. The amount fixed in this tentative valuation is approximately the lowest per cent that the member of the engineering board in charge of the work is authorized to apply without specific authority from Washington. No reason is given why the general rule that the lower the cost the higher the engineering *per cent* does not apply here.

The director defines two methods of arriving at the amount properly allowable to cover the cost of engineering. These are defined as the *synthetical* and the *historical*. The *synthetical* method is similar to the reproduction method of estimating costs of construction. When based upon exact knowledge of the work required and practical experience in doing similar work, it is reliable. The estimate made by Mr. Newton was of this character.

The opinion or percentage method, with certain qualifications, is the method now employed by the division of valuation. Although the director refers to this method as the "*historical method*," or one in which the cost of reproduction is based upon the experience of the past as shown by construction records, an examination of this method makes manifest the impropriety of that designation.

The percentage used by the division of valuation is only slightly above what the records of the carrier show. These records undoubtedly are not complete. The extension was built in a year when the financial conditions in Texas were worse than at any time in its history, and the costs of work at that time are no criterion of reproduction costs. Nothing is known as to the accuracy of the costs shown by the Texas Central records.

GENERAL EXPENDITURES

It is quite apparent that the group of accounts included under the head of "General expenditures" did not receive proper attention. The director's memorandum says, "The member of the engineering board in preparing his report upon the Texas Midland has distributed general expendi-

tures over the different accounts, allowing a certain amount for each account." The director concedes that "it does not appear upon what basis the allowances were made by the member of the engineering board, * * *." The indefinite—and so far as appears the arbitrary—method of fixing these figures is illustrated by the language of the engineering report. For example, as to Account 71—Organization expenses, it is said: "Under this account was included a charter fee, as required by the statutes of the state of Texas, and a few other incidental expenses."

As to Account 72—General officers and clerks, it is said: "An estimate was made of the necessary executive and general officials, clerks and their expenses, necessary to the construction of the property."

As to Account 73—Law, it is said: "Under this account has been included the necessary legal expense, including clerks, stenographers, office rent, and other expenses incidental thereto. Nothing has been included in this account covering the expense of the acquisition of lands or right of way."

As to Account 75—Taxes, there was allowed an amount "equal to one-fourth of the total amount of taxes paid by the Texas Midland during the year 1914." Mr. Worley, member of the engineering board, did not depreciate organization expenses, general officers and clerks, or law, but does depreciate taxes. The director does not appear to support the tentative valuation in this respect as in the memorandum it appears that he favors depreciating the whole group. This group of accounts in the tentative valuation in this case well illustrates the disregard of that provision of the valuation act which provides that there shall be "an analysis of the methods by which these several costs are obtained, * * *."

The language of the act upon this point is plain. No one denies that the methods employed are required to be stated in detail, *i. e.*, "an analysis" of methods must be made. If methods were considered and settled in advance, they are not disclosed in the tentative valuation. The Texas Midland claims that the tentative valuation should report the methods employed in the valuation of its property and that it has a right at the final hearing to test the reported figures by the principles adopted and methods employed. We have never heard any reason why the tentative valuation and report should omit a statement of the methods employed to make it.

COST OF OBTAINING MONEY

It will be observed that the discussion in this chapter of the director's memorandum is not confined to interest during construction as that account is defined in the classification. It is the cost of obtaining the money which includes not only the items of expenditure specified in the definition of the account "interest during construction," but also includes the cost of obtaining the money, such as syndicating, banking and other expenditures not included in the interest account. It does not appear to be claimed by the director that *any facts in the Texas Midland case* would justify the suggestion contained in paragraph 2 that one-half of one per cent., or that one per cent., would cover the brokerage charge or the cost of commissions, syndicating, banking, etc.

The assumption that the credit of the Texas Midland is or would be good enough to enable it to borrow money to build its railroad or to extend its existing road upon a six per cent basis is without foundation in fact.

But even assuming as a basis for the estimate that the credit of all companies is *good and the same*, six per cent is too low a rate of interest to cover not only interest but the entire "cost of obtaining the money" including commissions, syndicating, banking and other expenses.

The Texas Midland claims that the rate of interest on any reasonable assumption of facts *applicable to its situation* should not be less than eight per cent and that in addition

thereto it would have to pay commissions covering syndicating, banking and other expenses of at least one per cent.

CONSTRUCTION PERIOD

The question of what should be the length of the assumed construction period is entirely a question of engineering fact. Its decision depends upon the peculiar facts of the particular case. The record discloses no detailed study on the part of government engineers. The testimony of Mr. Worley shows that he had given no study to the determination of the program of construction, and that he had no definite idea of any necessity of investigation of the problem or of its influences upon interest, other general expenditures, unit prices, etc. He showed a lack of familiarity with practical questions which are determinative of the period which should be assumed.

The carrier called two witnesses who had studied this question from the practical standpoint of Texas Midland conditions. Mr. Holbrook's testimony shows a very careful analysis based upon intimate knowledge of local conditions and proves very conclusively that the length of the assumed construction period has an important influence upon unit prices. This is true because rush jobs cost more and haste increases the risk. If time is short bids will be higher. Mr. Holbrook was of the opinion that 24 months would be required for the actual construction of the property. This study is based upon a personal reconnaissance and survey of several lines in Texas, three of which either crossed the Texas Midland or were in the immediate vicinity.

An analysis of the same problem was made by Mr. Newton. His analysis developed the necessity of a construction program contemplating a construction period of 28 months preceded by a four months' period for preliminary surveys and contemplated that 75 per cent, of the ballasting would be done subsequently. The testimony of Mr. Holbrook and Mr. Newton is harmonious. It is based upon the same sort of analysis and experience and is not contradicted. The record shows conclusively that the particular facts involved in the problem on the Texas Midland was not studied by the government engineers. As there is no supported opinion in opposition to the reasonable and well sustained testimony of Messrs. Holbrook and Newton, their views should be adopted and the tentative valuation should be changed accordingly.

INTEREST DURING CONSTRUCTION

The director's memorandum in substance admits that the valuation act requires that the present cost of procuring the right of way be ascertained and reported as part of the reproduction cost of the railroad. This has not been done or attempted in the Texas Midland case. As shown by exhibit introduced in connection with the testimony of Mr. Newton by far the largest part of the expenditure for lands, rights of way and terminals will be made in advance of the commencement of actual construction. It follows as a matter of course that the moneys so expended must be in readiness in advance of the need therefor, and that the same will bear interest during a relatively long period of time. The exhibits introduced in connection with the testimony of Mr. Brown, the commission's accountant, bearing upon the rate of expenditure of money in railroad construction, omitted land costs from consideration. As the amount of such expenditures is sometimes as high as 20 or more per cent of the total, this omission renders the Brown exhibits of little, if any, importance so far as interest during construction is concerned.

The director's suggestion that the allowance in the Texas Midland case of \$144,691 be increased to \$166,728 excludes all allowance of interest on account of expenditures for land. The cost of reproduction must include the present cost of acquisition of lands. Interest thereon must be included.

After further consideration by the division it is concluded

that interest at six per cent for one-half the period produces too low an amount. As we understand it, the director's memorandum suggests that an additional three months be allowed.

Heretofore we pointed out that the testimony of Messrs. Holbrook and Newton in this case shows that the construction period allowed by Mr. Worley—4 months for preliminary work and 14 months for construction—is too short; that the period supported by Messrs. Newton and Holbrook is sustained; that the testimony of Mr. Newton as to the percentage of the total amount which would be expended in each period is uncontradicted; that the same shows—as now appears to be admitted by the director—that one-half of the construction period is too short to be used as a basis for calculating interest at six per cent on the entire sum, and that the amount properly allowable therefor is in excess of interest on the entire sum for two-thirds of the construction period. In the light of these facts we contend that, if any rule for general application is now to be stated, it should be that interest on the entire sum at an appropriate rate should be calculated for at least two-thirds of the entire construction period.

The original cost of the Texas Midland lands as reported in the tentative valuation is incomplete. The land was acquired long ago. Since then the lands along the line of the Texas Midland have greatly increased in value. In this case, original cost at time of construction is so much less than present value that it is not an important indication or item of evidence. It is now quite impossible, we think, to divide the total original cost so as to show separately the so-called "acreage value" at the time of acquisition, or the cost in excess of the same. The suggestion of the director to the effect that the multiplier disclosed by actual purchase at time of construction would be applicable now is without foundation. Conditions have changed.

In the tentative valuation no attempt was made to show the cost of acquiring the lands, rights of way and terminals of the Texas Midland at the present time. The carrier's proof in the case establishes it. There is no conflict in the evidence as to the proper ratio or multiple. There is conflict in the evidence bearing upon the naked land value of adjacent and adjoining lands—the basic figure. If a multiple of 2.23 be applied to the basic figure reported in the tentative valuation for the lands classified by the division as used for transportation purposes there will be produced \$527,816. If applied to the figures which the carrier's testimony supports there will be produced \$628,474.

Present value is at least as much as such present cost of acquisition.

OTHER VALUES AND ELEMENTS OF VALUE

As to other values and elements of value the tentative valuation fails to comply with the law. The commission is directed,

"* * * The commission shall in like manner ascertain and report separately other values, and elements of value, if any, of the property of such common carrier, and an analysis of the methods of valuation employed, and of the reasons for any differences between any such value, and each of the foregoing cost values."

This important matter is treated in the tentative valuation in the following words: "No other values or elements of value were found to exist." We do not know what meaning that statement is intended to convey. It is plain that the law requires these "intangibles" to be ascertained and reported. They must be considered in the ascertainment of final value.

The director suggests that no evidence was offered by the carrier upon this point. We are sure that he will agree that as to these other values and elements of value it is as much the duty of the commission to investigate and ascertain the facts as it is to inventory the physical property in detail and show the several costs thereof as required.

The commission has before it all of the facts referred to in the tentative valuation. These include the inventory, the cost figures, the land figures, the financial history, the traffic statistics, the net and gross earnings in detail, the expenditure of moneys, etc. The gradients, the station facilities, its connections, its sources of traffic, together with the growth thereof as shown by the regular reports of the company are known or are available. The amount of intangible value fixed by Texas for the purpose of taxation is shown. This great mass of information furnishes a sufficient basis of fact for the determination of the value of the properties of the Texas Midland as a whole. The commission has quite as complete information as usually is furnished to the courts in confiscation cases involving the value of railroad properties.

The Texas Midland is a small and simple property. It has no valuation department. It would have been proper for it to call witnesses experienced and expert in the ascertainment of the value of railroads. The commission also had the right to avail itself of the services of like experts or to determine the fact without such aid. It cannot be said that the value of the Texas Midland property cannot be ascertained on the facts now in the possession of the commission, without the aid of expert witnesses. That value, while a unit and single in substance, may, for the purposes of thought and discussion, be divided between that which is attributable to the tangible or physical property and that which is attributable to the intangible or non-physical property, i. e., other values and elements of value. There is no denying that the act requires other values and elements of value to be found. This may be done by first ascertaining the value of the property as a whole and by deducting therefrom the amount which the commission finds should be attributed to the tangible or physical elements thereof.

The commission is now engaged under the act in ascertaining the value of all the railroads in the country. The Texas Midland is of minor importance. The difficulties of the problem before the commission are great. We have always contended,—as said by the director,—that neither this railroad nor any of the other railroads whose tentative valuations are on hearing before the commission present the phases of the subject of valuation which should be before the commission before it lays down any rule for the determination of a final value. Under the circumstances the commission should defer the determination of the other values and elements of value in this case until right principles shall have been found upon a full consideration of a sufficient number of typical railroads.

COAL MINE PRODUCTION SHOWS A NET DECREASE

In discussing the general need of fuel conservation in the boiler rooms, Van H. Manning, director of the Bureau of Mines, Department of the Interior, has issued the following statement:

There is one phase of the present coal situation which may put an entirely different light on the supposed increased production of coal of the present year. In round numbers, there was produced 600,000,000 tons of fuel last year. The statement has been made that 50,000,000 more tons will be mined this year. The preparation of this increased quantity of coal has not been as good as in times past. Analyses of samples show in many cases a greatly increased quantity of ash. Repeated cases are brought to the attention of the Bureau of Mines where coal which would run from 6 to 8 per cent ash in normal times is running from 12 to 18 per cent of ash in these abnormal times. Complaint about the preparation of coal is very general and it is not at all improbable that 5 per cent more ash is included in this year's coal than in previous years. If such a figure is true, it

means that 32,500,000 tons of the estimated output of 650,000,000 tons is nothing but increased ash.

If we can imagine over 600,000 car loads of ash being added to the present burden of transportation, the evident effect on car supply and transportation troubles would be seen. If this were the end of the matter, it would not be so bad, but there is another factor well known to engineers which is apt to be overlooked by the non-technical user. The extensive experiments carried on by the Government at the St. Louis Exposition showed that with the coals used, there was a decrease of about $1\frac{1}{2}$ per cent in efficiency for each 1 per cent addition to the ash content of the coal—that is to say, the inclusion of more ash with the coal decreases the value of the fuel not only the amount equal to the useless ash, but it makes the remaining good coal less effective to the extent of $1\frac{1}{2}$ per cent for each 1 per cent of ash. The inclusion of 5 per cent more ash in the fuel, therefore, means a reduction in efficiency of the remaining good coal of about $7\frac{1}{2}$ per cent, which, added to the 5 per cent useless ash, makes a total reduction in effectiveness of $12\frac{1}{2}$ per cent.

According to this point of view, although 650,000,000 tons may be produced in 1917, its effectiveness as compared with previous years is probably about seven-eighths of this, and equivalent to a production of normally prepared coal of about 570,000,000 tons. We have, then, instead of an increased production as compared with last year, an actual decrease of effective coal of about 30,000,000 tons. If this is added to the estimated increased needs, due to our accelerated activities, of 100,000,000 tons, we have a deficiency of the equivalent of 130,000,000 tons, instead of 50,000,000 tons to make up by good engineering and true fuel conservation in the boiler room.

SUPPLIES FOR AN ARMY OF ONE MILLION

The amount of freight transportation involved in furnishing supplies to an army of 1,000,000 men is described in a paper read before the war class of Columbia University

recently by Major Robert E. Shannon of the United States Army Quartermaster's Corps.

"For an army of one million men," he stated, "based on the regular United States garrison ration, it will be necessary to transport 26,700,000 lb. of beef or its equivalent in substitutive articles of the ration, per month; 6,750,000 lb. of bacon, 26,700,000 lb. of flour, 37,500,000 lb. of potatoes, 4,500,000 lb. of beans, 2,093,000 lb. of coffee and 6,000,000 lb. of sugar, or if we consider all the articles that go to make up the ration, to transport food alone for an army of 1,000,000 men, for one month, will require tonnage for 146,000,000 lb.—and to feed the horses and mules of this army of 1,000,000 will require the transportation of nearly 260,000,000 lb. of forage per month. When we consider the matter of clothing, to keep this army properly clothed, will require in round figures, per month, 300,000 pairs of breeches, 300,000 overalls, 300,000 shirts, 400,000 pairs of shoes, and 250,000 suits of underwear, to say nothing of the coats, overcoats, rubber boots, blankets, socks, hats and other articles that go to make the clothing allowance of the soldier."

EXPORTS OF RAILROAD EQUIPMENT IN OCTOBER.—The principal articles of railroad equipment exported from the port of New York during October, 1917, according to a bulletin of the National City Bank of New York, were steam locomotives valued at \$3,463,336; steel rails, at \$1,278,021; freight cars at \$785,783; and railroad spikes, at \$227,592.

ENGLAND ENCOURAGES TRUCK TRANSPORTATION.—In view of the shortage of petrol and the necessity of relieving the traffic on railways, it has become necessary that all privately owned lorries and steam trucks should be utilized to their fullest carrying capacity, and accordingly the transport section of the Ministry of Munitions has arranged a scheme of mechanical transport control to cover the West Riding of Yorkshire, which began operation on November 12. The object of the scheme is to provide loads for empty journeys that lorries are at present running and loads for lorries not fully employed within a radius of 20 miles of loading point.



Photo by Central News Photo Service.

Locomotives for the British Forces in Mesopotamia, Being Conveyed up the Tigris River, on a Barge.

Fuel Records on the Baltimore & Ohio

Methods for Following the Individual Performance of
Locomotives on a Road Having a Divisional Organization

By W. L. Robinson

Supervisor Fuel Consumption, Baltimore & Ohio

FUEL economy has now assumed an even greater degree of importance than it has ordinarily held. The United States Chamber of Commerce, co-operating with the Council of National Defense, he said: "Coal is the sinew of war, and he who unnecessarily reduces the country's available stock of coal may curtail the nation's energies in the great industrial conflict." A successful war implies supremacy in the industries on which it is based, and coal is the very root and foundation of war-time industry. Every pound that can be obtained is urgently needed for domestic and manufacturing purposes, for making munitions, for steam vessels and for railways; all directly or indirectly necessary to carry on and win the war.

Fuel economy has long been considered a mechanical problem and little supervision has been given the subject on many roads by officers other than those of this department. Recently, however, a more general recognition of this as a transportation problem has been noted, particularly in the meetings of the International Railway Fuel Association. The sooner all departments of a railway recognize their relation to fuel consumption, the sooner will progress be made in reducing admitted wastage, for fuel losses occur at all stages from purchase, inspection, distribution and utilization, right down to cleaning fire on the ash track. The largest losses, however, occur under the jurisdiction of the mechanical and transportation departments.

The human element is a large factor in fuel economy. A man will react to his environment, and where a commodity like coal is handled as if it were sand, ballast or dirt, and in such large quantities, he will come to consider economy of small importance. This is very well illustrated by the difference in handling wage and fuel accounts; every care and check is thrown around wage accounting, while on most roads the basis of fuel accounting originates with the lowly coal dock man, and fuel accounting finally becomes a matter of adjustments. Any scheme for fuel economy must aim to overcome this condition, to bring about a realization of the actual dollars and cents value of coal, both by the men and by the officers.

For the purpose of familiarizing and educating all concerned regarding the value of fuel, the Baltimore & Ohio distributes monthly statements, both in tabulated and graphic form, showing the total consumption and consumption on an amount-of-work basis. This information is sent to all executive and operating, and to division staff officers.

These statements show the performance of locomotives in freight and passenger service by months and by divisions, with totals for the entire road; the amount of fuel used on the entire system by months; the total cost of the fuel distributed by months; and the average cost of fuel per ton by months. On the fuel performance statement each division is rated according to the percentage increase in gross ton-miles per ton of coal over the same month of last year, in freight service, and the percentage decrease in pounds of coal per car-miles over the same month last year, in passenger service. These statements also show cost of the fuel saved or lost for each division. The chart showing the average cost of fuel per ton by months is particularly interesting. There has been a gradual increase in this cost from a little less than one

dollar per ton in June, 1916, to \$2.40 per ton in August, 1917, or an increase of 140 per cent.

Active interest shown by supervision and an intelligent use of reports is an unfailing method for securing co-operation in matters affecting fuel economy. This is illustrated in the case of a superintendent who reduced his percentage of locomotives with leaking packings, valves out of tram, and poor steaming qualities to an almost negligible amount, by the simple procedure of giving his master mechanic periodically a list of defective locomotives taken from regular reports and asking to be informed as soon as the repairs were made.

Standardized methods of firing and operating locomotives with systematic instructions are necessary accompaniments of fuel economy. The Baltimore & Ohio has issued a text book for engineers and firemen on locomotive management, called "Good Firing." This book contains instructions which will help the fireman in properly firing the locomotives. Enough of the scientific theory of good firing is given so that the fireman may have a rudimentary idea of what he is trying to accomplish and what it means. In addition to this there are instructions to engineers, fuel standards, instructions for the operation of locomotives equipped with superheaters, brick arches and stokers.

The use of the wrong kind of coal, improper preparation and sizing, have a very detrimental effect on fuel economy, as was clearly demonstrated by recent laboratory tests made at the University of Illinois.[†] The effect of proper sizing is not fully appreciated, or if so, is not given the consideration its importance demands. In the tests just referred to a variation in sizing from 1¼-in. screenings to 2-in. lump resulted in an increase in evaporation of 17½ per cent. The same consideration should be given to physical characteristics as to B. t. u. value and length of haul, by those to whom the purchase of railway fuel is intrusted, to obtain the maximum efficiency from the use of coal on grates. The full realization of extended application of apparatus for burning fuel in pulverized form, now so promising, should, however, remove eventually any necessity for considering the sizing.

Poor coal is a formula used to cover a multitude of real sources of inefficiency, but no matter how much it is abused, the fact remains that we do have poor coal which results in a waste of transportation facilities, a waste of fuel, time and money; it causes delays and failures. At present above all others, poor coal is a crying indictment against the coal producers, as it can only have one result—a slackening in the intensive manufacturing production demanded by war necessities. Coal producers can largely remove this industrial impediment by pooling their interests, and then concentrating the labor and energies during the war on mines producing satisfactory fuel. By concentrating for the period of the war on the mines capable of producing the best coal, greater efficiency should be forthcoming due to ability to haul more heat units per cubic foot of coal car carrying capacity, lessened amount of mine labor required and lessened amount of switching.

FUEL ECONOMY RECORDS

It is obvious that before any systematic improvement can be made in reducing fuel consumption, the particular sources

[†]Abstract of a paper presented at the December meeting of the New England Railroad Club.

[‡]See *Railway Age Gazette*, July 13, 1917, page 51.

of waste must be known. Before a general saving can be made, individual economy must be practiced, and the man on the locomotive offers the best opportunity for results in this field. His co-operation is essential for the success of any plan.

The Baltimore & Ohio has in operation a method for reporting daily the amount of fuel used by each engineer, each fireman, and also by each locomotive for every trip made. The fundamental idea consists in giving the supervising officers, particularly the master mechanic and road foreman of engines, positive information regarding specific men or

formance has been made, but if, at the same time, it were known exactly what should have been used on that particular trip the efficiency of the fuel performance would be apparent at once. For the purpose of making such comparisons, fuel standards were established on each division, showing for any trip the amount of fuel which should be used. These fuel standards vary with the class of service, type of power, direction and tonnage. They are not based on any theoretical calculations but on averages of consumptions actually made over a period of six or more months. The reason they are based on averages instead of the best performances, or on

TIME		12:01 A. M.	6:00 A. M.	12:01 P. M.	6:00 P. M.	Div. 33-13.	
TEMPERATURE		40	48	50	45		
WEATHER		do	do	do	do		
CLASS OF RATIO		A	A	A	A		

TRAIN REFERENCE	ROAD ENGINE	CONDUCTOR	ENGINEER AND FIREMAN	STATIONS		ENGINES ASSISTING OR DOUBLING	STATIONS		HANDLED IN TRAIN					Rating Is Gross Adjusted Tons	Train Mileage	GROSS TON MILEAGE IN HUNDREDS		Initial Tons				
				From	To		From	To	Engines Dry Basis	Left Initial Tons	Arrived Terminal Tons	Engines Dry Basis	Lead			Empty	Total		Actual	Adjusted	Actual	Standard
<i>Slow Freight Eastward</i>																						
Ex	4057	McFarland	Shaw	2102	936				92	122	62	39	26	0	26	1791	1973	1900	96	1720	1656	3.3
Ex	4018	Gornally	Shaw	2102	936				69	16	52	62	36	0	36	1678	1700	2000	96	1580	1650	6.1
Ex	4031	Lawrence	Kennel	2102	936				89	22	92	102	30	0	30	1640	1850	2100	96	1574	1822	6.8

Fig. 1—This Form Is Filled Out on Each Division Every Twenty-four Hours

locomotives where their supervision may be profitably employed. This information reaches the hands of the supervising officers promptly—say one to three days after the completion of the trip—so that while the incidents are fresh in the mind of everyone concerned, the development of bad conditions may be checked and any corrective measures applied. On each division there is a fuel clerk whose sole concern is fuel data. His duties consist in obtaining correct fuel reports, making proper individual charges, and compiling all regular and special reports in an intelligible manner, to be used by the supervising officers.

Form 2520 (Fig. 1) is filled out on each division for the 24-hour period. This form furnishes detail information regarding the fuel consumption for each trip, but since it is also the base of much other statistical data as well as fuel, the information is necessarily profuse, and a busy man is liable to miss the significance of any particular fuel item thereon among the mass of other irrelevant data. For this reason the fuel clerk compiles from this form a résumé of the various items which is a guide to the man in a supervising capacity, and he also makes a study of the individual trips which show the poorest fuel performance and gives detailed information of such trips to the road foreman or the party responsible for fuel economy.

The actual amount of fuel consumed is obtained from daily reports of coal disbursements, Form 2347 (Fig. 2), sent in from each coaling station and engine terminal to the fuel clerk. On the form is listed separately each engine receiving coal, the time and amount for a 24-hour period. The total actual coal used by any locomotive can be quickly determined by totaling the amounts received at each coaling station, this amount then being filled in its proper column on Form 2520 (Fig. 1). It is assumed that each tender is full on leaving its initial terminal, for which reason the amount required to again fill the tender at the final terminal, plus that received at any intermediate stations, will give the total amount used. In case the tender is not filled at either terminal, this is reported on Form 2347 (Fig. 2), giving the amount which would have been required to fill the tender, and necessary corrections are then made by fuel clerk. The inauguration of individual fuel records and standards has required no additional reports or work other than the reports compiled by the fuel clerk himself. The same reports used by the accounting department are used for this work.

A mere knowledge of the actual amount of fuel used is no indication in itself whether a good, average or poor per-

formance has been made, but if, at the same time, it were known exactly what should have been used on that particular trip the efficiency of the fuel performance would be apparent at once. For the purpose of making such comparisons, fuel standards were established on each division, showing for any trip the amount of fuel which should be used. These fuel standards vary with the class of service, type of power, direction and tonnage. They are not based on any theoretical calculations but on averages of consumptions actually made over a period of six or more months. The reason they are based on averages instead of the best performances, or on

THE BALTIMORE AND OHIO RAILROAD COMPANY.										Form 2347	
Division <i>Monongah</i>					Date <i>Mar 2</i> 1917						
Daily Report of Coal Unloaded and Delivered at <i>Coaling St. M. Va.</i>										Station.	
POUNDS OF COAL UNLOADED As per accompanying Card Manifest				Amount consumed in 24 hours when the coal is taken or the additional amount necessary to fill tender when only partly filled				POUNDS OF COAL DISBURSED As per accompanying Coal Tickets			
CARS		Weight of Coal	Engine Number	Time Arrived	Time of Coal Required	Engine Number	Time Arrived	Time of Coal Required	Class or Service	Freight	Yard
Initial	Number	3	4	5	6	7	8	9	10	11	12
B70	28046	92100				2356	74	62			16000
C70	46118	89400	1040	62	2000	4060	74	62		10000	
D70	75034	100100	1878	62	4000	1878	74	62		10000	
E70	135870	105500				2761	80	62		6000	
F70	63387	113500	2244	62	6000	2244	80	62		6000	
G70	51105	77400	2113	92	4000	2113	2	92	8000		
			2250	125	2000						
			2392	15	2000	2392	72	15		4000	
			1646	15	2000	1646	74	15		5000	
			2819	35	8000	2819	74	35		10000	
			4081	35	4000						
						2808	74	62		16000	
						1110	74	72		10000	
						2115	30	92		16000	
			2905	105	8000						
						2106	4	15		18000	
						2252	74	35		10000	
			2806	15	2000	2806	74	35		8000	

Fuel Foreman must return this Card Manifest (Form 2347) to the Fuel Clerk at the end of the 24 hours.

See Instructions on Back

Coal *J. A. Anderson, M. M.*

Fig. 2—Daily Report from Coaling Stations and Engine Terminals

ing up the matter with any crew persistently exceeding the standard. Constant care is exercised to have these fuel standards just, and revisions are made whenever necessary. This because an appeal is made to the competitive spirit

among the men to attain a good fuel performance by publishing their average standing monthly.

With the total fuel consumption, both actual and standard, known and placed on Form 2520 (Fig. 1), the remaining fuel data for each trip (total costs, pounds of coal per 100-ton-mile, cost per 100-ton-mile and fuel performance) are quickly obtained by use of the slide rule. This completes the work on Form 2520, and a summary is next made on Form 1598 (Fig. 3) showing the total fuel costs by the day by classes of service, or such other headings as may be desired for general statistical purposes, and for making divi-

fuel waste appears to have been due to mechanical defects, he ascertains if it has been shown on the work reports and if the repairs have been made. This is beneficial because the crews soon learn that constant supervision is exercised and that every poor fuel performance is noted, and further, because during every month each road foreman has instructed anywhere from 15 to 30 crews in matters affecting fuel economy. It is the slow, conscientious, individual work of this character that achieves beneficial results which are lasting.

Superintendents are busy men, and are more vitally inter-

BALTIMORE AND OHIO RAILROAD COMPANY.

Form 3228 A-20

Case of Engineers and Trainmen for Philadelphia Division for 24 hours ended 11:59 P. M., October 7, 1917.

TIME CONSUMED		WAGES OF ENGINE AND TRAIN CREWS, INC. OVERTIME					Total Overtime Expense in Dollars	Total Standard Wage Expense	WAGE COST PER 100-TON MILES	Wage Performance %	POUNDS FUEL CONSUMED				FUEL EXPENSE				Fuel Performance %	Wage and Fuel Performance %	REMARKS	
Real	Time	Std.	Std.	Std.	Std.	Total		Actual	Standard	Actual	Standard	Actual	Standard	Actual	Standard	Actual	Standard					
5.7	.5	9.5	2049	260		2354	33.0	2049	137	122	89.3	160	172	930	1000	1840	1320	107	116	107	92.0	
4.4	.5	11.7	2047	260		3307	101.6	2231	210	139	66.3	160	172	1010	1030	1840	1320	116	124	107	87	
6.9	.5	14.3	3682	260		3942	165.1	2291	250	112	44.8	160	166	1020	1050	1840	1300	117	121	103	84	

and Gives Detailed Information Regarding Fuel Consumption for Each Trip

sional and period comparisons. This form also shows the total transportation wage costs for the same headings, and is a daily unobtrusive visitor to the desk of each superintendent, reminding him where any efforts to reduce transportation costs will be most amply rewarded.

A study is next made by the fuel clerk of the individual runs on Form 2520 (Fig. 1), and men with the poorest performance are selected as meriting the attention of the road foreman of engines. It was felt that a road foreman of en-

gested in the kind of a fuel performance their division is making than in what any particular men are making, and for their benefit Form 1509-F (Fig. 4) is next compiled by the fuel clerk from Form 2520 (Fig. 1). Fig. 4 shows the total fuel cost and consumption, both actual and standard, for the day, also the unit consumption actual and standard for the day, accumulative average for the month and for the same period one year previous. This form shows at a glance the divisional fuel performance for the day, whether

Form 1598-B Rev.

BALTIMORE & OHIO RAILROAD COMPANY

DAILY SUMMARY OF FREIGHT TRAIN PERFORMANCE

24 HOURS ENDED 11:59 P. M., September 6, 1917

Chicago DIVISION

Direction	Train Miles	ACTUAL TON MILES IN HUNDREDS		TOTAL TIME CONSUMED		Total Overtime Expense in Dollars	TOTAL WAGE EXPENSE INCLUDING OVERTIME IN DOLLARS					Total Standard Wage Expense in Dollars	TOTAL FUEL EXPENSE IN DOLLARS		TOTAL WAGE & FUEL EXPENSE IN DOLLARS		REMARKS
		Handled	Standard	On Road	Total Crew Time		Road Crew	Helper Crew	Relief Crew	Black Roads	Total		Actual	Standard	Actual	Standard	
EAST	955	13,797	15,405	44.4	59.0	2	192	-	-	-	192	190	293	264	485	454	
WEST	527	7,965	9,603	22.9	28.0	-	107	-	-	-	107	107	170	154	277	261	
TOTAL	1492	21,762	25,010	67.3	87.0	2	299	-	-	-	299	297	463	418	762	715	

QUICK DISPATCH

Fig. 3.—Summary Expense Sheet for the Superintendent by Classes of Service. The Information Is Taken from Fig. 1

gines could not well handle more than one such case, on an average, per day, hence one card, is filled out for each road foreman of engines, showing in detail all information regarding the worst runs made during the day. The cards are small—3 in. by 5 in.—and easily carried in the pocket. The practice is not to call in any man or to cause any antagonism by censure or discipline; but in his daily trips about the division, as he gets on an engine, the road foreman, if he has received a card regarding that particular crew, refreshes his memory from it, and questions or instructs them with a view of correcting the causes of their poor fuel performance. Or he may make it a special point to ride with and instruct the crews so reported. In any event, where the cause of the

it is good or bad, and whether it is getting better or worse. If unsatisfactory, Form 2520 (Fig. 1) will show all the details as to cause and where corrective measures may be applied.

BULLETIN BOARDS

The other feature employed by the use of the fuel standards to attain economy in the use of fuel is the normal desire of the average man to lead in any sport or work involving competition. This is accomplished by publishing on the bulletin boards every month a list of all engineers and firemen on the division ranked in the order of their average fuel performance for that month. This is obtained by keeping

No attempt has been made in inaugurating these fuel standards to separate the fuel consumed at the terminals from that consumed on the road. The error involved in charging the record with the terminal fuel consumption is negligible because the error is practically a constant one, applying to all crews alike, and will not affect the relative standing on which their ratings are based. The ton-mile unit was used in preference to the car-mile unit, on account of the variations existing in car weights.

Fuel standards were originally expressed in pounds of coal per hundred-ton-miles, but these were soon discarded in favor of pounds of coal per trip. Practical use quickly developed the fact that for any given run the total coal used on a trip did not vary greatly, regardless of the tonnage, while, due to the same reason, the pounds of coal per ton mile varied almost directly as the tonnage; thus, to avoid having an excessive number of fuel standards for each run, the standard was made total pounds per trip. Otherwise the engineer was penalized each time he hauled lighter tonnage than average, and it is a measure of his efficiency we are after rather than that of train loading.

The general scheme of fuel records as described covers

that they can be used at the current time, is of more importance in connection with the latter than any fine degree of accuracy.

The success of the methods followed is evidenced by a decreasing or nearly stationary total fuel consumption, against a continually increasing total tonnage handled, as shown in the table. With the tonnage increasing 40.7 per cent the fuel consumption increased only 7.3 per cent. The comparisons are made against the fiscal year ending June 30, 1911, due to the fact that the present organized effort to effect fuel economy was not instituted until the latter part of that fiscal year. The increased size of locomotives, the use of superheaters, changed conditions of fuel and firing by introduction of stoker locomotives, as well as the following up of fuel consumption, have had a bearing on holding down or increasing the consumption, and it is probably not possible to determine definitely the relative values of the various causes.

DISCUSSION.

Henry Bartlett, chief mechanical engineer of the Boston & Maine, called attention to the necessity for everybody co-

Form 1150-A		Form 1150-A	
<p>THE BALTIMORE & OHIO RAILROAD COMPANY. TIME REPORT OF ENGINEERS AND FIREMEN.</p>			
From <i>Reverend</i>	To <i>Brunswick</i>	Date <i>Oct. 12</i>	1917
Conductor <i>B. Beapaley</i>	Engine No. <i>4840</i>	Train No. <i>XW</i>	Sec. No.
Engineer <i>J. F. Johnson</i>	Time Reported for Duty <i>8:10 A.M.</i>	Time Relieved <i>7:10 P.M.</i>	
Fireman <i>R. Jones</i>	<i>8:10 A.M.</i>	<i>7:10 P.M.</i>	
Time Fixed to Leave Terminal <i>8:30 A.M.</i>	Date <i>Oct 12</i>	1917	Correct: <i>J.F.S.</i>
Time Left Terminal <i>9:45 A.M.</i>	"	1917	
Time Arrived At Terminal <i>5:27 P.M.</i>	"	1917	Correct:
Time Arrived At Ash Pit <i>6:55 P.M.</i>	"	1917	
Class of Service <i>Freight</i>	Time Claimed <i>8</i>	Overtime Claimed <i>3</i>	(over)

Form 1150-A	
<p>THE BALTIMORE & OHIO RAILROAD COMPANY. ENGINEERS' FUEL REPORT FOR TRIP.</p>	
Engine No. <i>4840</i>	Train <i>XW</i> Date <i>Oct 12</i> 1917
Time Left <i>8:10 A.M.</i>	Time Arrived <i>7:10 P.M.</i> Service <i>Freight</i>
From <i>Reverend</i>	To <i>Brunswick</i>
Engineer <i>J. F. Johnson</i>	
Fireman <i>R. Jones</i>	
	POUNDS COAL
	A B
Out of Tender when Relieving Eng.	<i>4,000</i>
Coal Taken at <i>Reverend</i>	<i>20,000</i>
" " "	
" " "	
" " "	
Out of Tender when Relieved	<i>8,000</i>
Total Actual Amount Used on Trip	<i>24,000</i>
Standard Allowance for Trip	<i>17,700</i>

Fig. 6—Fuel Record Made Out by the Engineer

the subject from two different viewpoints; one, that of pointing out periodically the results obtained, but representing the past which cannot be changed and serving more as a guide

RELATION BETWEEN FUEL CONSUMPTION AND TONNAGE HAULED COMPARISONS BASED ON STATISTICS FOR FISCAL YEAR 1911

Fiscal year ending June 30	Variations in total tons locomotive fuel consumption		Per cent of increase in net tons one mile	Per cent of increase in gr. revenue
	Per cent increase	Per cent decrease		
System 1912.....	...	5.1	6.4	5.0
1913.....	2.2	...	21.1	15.
1914.....	3.0	...	12.9	12.5
1915.....	...	7.3	9.3	4.3
1916.....	...	0.1	33.3	26.7
1917.....	7.3	...	40.7	39.0
Cum. Div. 1912.....	...	6.5	5.6	...
1913.....	2.9	...	17.3	...
1914.....	...	3.3	10.9	...
1915.....	...	12.9	5.9	...
1916.....	...	5.3	32.3	...
1917.....	...	5.3	39.4	...

for the future; the other, that giving information which can be promptly used in correcting specific irregularities as they develop. The problem of getting these records available, so

operating in the matter of saving fuel. As chairman of a committee appointed to investigate the fuel situation on the Boston & Maine, he found that the engine crews were not the only ones to be educated in the matter of fuel economy. Much depends upon the way the fuel is handled at the coaling stations, on the maintenance of the power, and in the handling of trains by the transportation department.

J. T. Anthony, assistant to the president of the American Arch Company, called particular attention to the necessity of proper supervision in the matter of fuel economy. Fuel-saving devices can be applied to locomotives, but unless the men are instructed properly regarding their use and maintenance, these devices will not fully serve their purpose. Considerable benefit will be obtained by giving the men reading matter on the subject of fuel consumption, with instructions as to how to use it. In view of the general fuel situation it is no longer a question of saving money, but of saving coal.

S. Bisbee, fuel supervisor of the Boston & Albany, favored the competitive method of handling the locomotive fuel problem. In order to obtain the best results from the individual performance sheets, it is very desirable to issue the information promptly. The engine crews should be thoroughly instructed in the principles of proper fuel combustion, and

State Commissioners Before Newlands Committee

Hearings Begun at Washington December 11
Continued This Week; State Authority Defended

CARL D. JACKSON, chairman of the Wisconsin Railroad Commission, on December 12 continued his testimony, reported in part in last week's issue, describing the work of the Wisconsin Commission for the purpose of showing that exclusive federal regulation, as proposed by the railroad, is unnecessary: "If state regulation is to be done away with," he said, "something just as effective must be substituted for it," and he doubted whether the plan of regional federal commissions would be as beneficial to the public and to the railroads as effective state regulation because he thought they would not be so familiar with local conditions.

He admitted that deplorable conflicts between state and interstate rates have arisen, although not in Wisconsin, he said, and that they should not be permitted, but he thought that the courts and the Interstate Commerce Commission have sufficient authority to correct them. For the purpose of avoiding such conflicts he favored the plan recommended by the Interstate Commerce Commission in its annual report, and endorsed at the recent convention of the National Association of Railway and Utilities Commissioners, that the federal commission, without any abdication of federal authority, be expressly authorized by law to co-operate with state commissions in efforts to reconcile upon a single record the conflicts between the state and interstate rates. A proposed bill to carry out the provisions of this recommendation is being prepared by a committee representing the Interstate Commerce Commission and the state commissioners.

In reply to questions asked by Representative Sims, Mr. Jackson said that the policy of forcing railroads to compete, which Congress has followed for 30 years, has been a mistaken one. "I do not think the competitive system is a success," he said, "but that co-operation and co-ordination should be encouraged, and I am not speaking with reference only to war conditions. The competitive system has not brought about good results. It has resulted in unnecessary duplication of facilities and has caused unnecessary expenses. The Interstate Commerce Commission should have power to prevent needless duplication."

Major S. W. Brookhart, of Washington, Iowa, an advocate of government ownership of railroads, testified on December 14, continuing a statement he had begun at a hearing on December 9, last year. Major Brookhart said he had formerly urged government ownership as a policy for peace times on the ground that it would save \$500,000,000 a year because the government can borrow capital at lower interest rates than private corporations, \$300,000,000 in increased value of real estate each year and \$400,000,000 by eliminating the waste of competition, a total of \$1,200,000,000 a year. In time of war, he thought this saving would be increased on the ground that the government can still borrow more cheaply than others, and because the increase in real estate values and in the amount of waste is greater during time of war. "In addition," he said, "war has brought about a crisis which private ownership can never meet. I believe the government will take over the operation of the railroads before the grass grows green, if not before the new year, and that they will never again be surrendered to their owners."

Major Brookhart said he thought a fair way to determine the value of the roads would be to take the average market price of their securities over a period of years, which would probably amount to about \$15,000,000,000.

As an argument for government ownership, Major Brook-

hart contended that both freight rates and passenger rates in this country are the highest in the world. He also said that the government could borrow capital at an interest rate about 1.75 per cent less than what private corporations would have to pay. He described the plan adopted in Great Britain upon its entrance into the war, by which the government took over the control of the roads and guaranteed the net earnings of 1913, but pays no freight rates. The expenses of the railroads are paid from their receipts from commercial traffic, and if a railroad earns more than during the pre-war year it is ordered to pay over the surplus to some railroad whose earnings have been reduced. This plan has been successful, he said, and instead of politics having entered into the railroad management it has been left entirely in the hands of railroad officers.

Charles E. Elmquist, formerly a member of the Minnesota commission and now Washington representative of the National Association of Railway and Utilities Commissioners, indicated that the state commissions are opposed to any plan of government control of railroad operations which would deprive the state commissions of their powers.

"If the state commissions are legislated out of existence," he said, "the only representative the public would have would be the counsel for large corporations, unless some authority were created for the purpose. The state commissions perform important functions as the agents of the shippers of interstate commerce as well as their regulatory functions. If the government takes over the railroads during the war it should only be done by utilizing the organization and experience of the state commissions."

Asked whether the public would be as well served by the creation of regional commissions, subordinate to the Interstate commission, as proposed by the railroads, Mr. Elmquist said that would depend upon the extent of their territorial jurisdiction and whether the commissioners were appointed from the territory or from outside. It would be possible to select commissioners from the territory who would be familiar with local conditions, but if the territory were made too large the plan would defeat its purpose, he said.

Ira B. Mills, chairman of the Minnesota Railroad and Warehouse Commission, described its work to show that it keeps in close touch with local conditions and is able to handle local matters more promptly and informally than would be possible for a commission at Washington. At one time, he said, he had advocated a centralized plan such as that now favored by the roads, but he had come to the conclusion that the state commissions are almost indispensable. He thought the Interstate Commerce Commission would be more successful if local matters could be handled locally with the right of appeal to the commission at Washington.

J. F. Shaughnessy, of the Nevada Railroad Commission, read a long statement criticising the attitude of the railroads and of the Interstate Commerce Commission in their handling of the transcontinental freight rate controversy, and he urged that Congress take the matter out of the hands of the Interstate Commerce Commission by enacting a rigid long and short haul clause to prevent railroads making lower rates to points where water competition exists than to the intermediate points. Mr. Mills had previously told the committee that a rigid long and short haul rule would not work as applied to interstate traffic.

Senator Cummins asked Mr. Shaughnessy whether he would have Congress follow the idea to its logical conclusion

and adopt the principle that all rates should be made on a mileage basis. Mr. Shaughnessy said he would not, because such a plan would interfere with other rates in which the intermountain country is interested, such as the blanket rates to points east of Denver on products of the soil.

Mr. Shaughnessy also criticised decisions of the Interstate Commerce Commission fixing passenger rates which had taken into consideration increases in the weight and cost of passenger trains. Railroad passenger service is conducted in this country in a too extravagant way, he said. "The railroads have followed the policy of using their passenger service as an advertising medium, and have therefore furnished a service superior to what has been needed. They are using heavy all-steel cars which require heavy track and heavy engines for their interstate travel which are only incidentally of benefit to the local traveler, and they are hauling around 10 tons of dead weight for each passenger. This is not necessary, and will drive the local passenger to using electric railways or automobiles. The weight of trains should be cut in two by using wood instead of steel, and the traveling public should be given the benefit of the reduction in fares."

Mr. Shaughnessy was using this as an argument against giving the Interstate Commerce Commission exclusive jurisdiction over rate regulation because he said the commission had fixed passenger fares with reference to interstate traffic conditions. Representative Esch pointed out that the Interstate Commerce Commission had repeatedly recommended legislation to require the use of steel cars on the ground of safety.

ENGINEERS PRAISED BY FIELD MARSHAL HAIG

Field Marshal Haig, commander of the British forces in France, has expressed to Gen. Pershing in a letter his thanks for the assistance given by men of the Eleventh Engineers around Gouzeaucourt on November 30. The Field Marshal's letter follows:

"General Headquarters British Armies in France, Dec. 6, 1917.—My Dear General Pershing: I have much pleasure in forwarding herewith for your information a copy of a report submitted to me by General Byng, commanding the Third British Army, on the gallant conduct of companies of railway engineers of the United States Army in and near Gouzeaucourt on the 30th of November.

"I desire to express to you my thanks and those of the British forces engaged for the prompt and valuable assistance rendered, and I trust that you will be good enough to convey to these gallant men how much we all appreciate their prompt and soldierly readiness to assist in what was for a time a difficult situation.

"I much regret the losses suffered by these companies."

17 ENGINEERS KILLED OR CAPTURED

General Pershing on Sunday sent to the War Department a casualty list in which appeared the names of 17 American army engineers recorded as missing as a result of the action of November 30 last. The report did not say whether these men were killed or whether they had been taken prisoners by the Germans. Nor did it say where they were "missed," but in view of the known fact that it was on November 30 that a large number of army engineers got into the action at Cambrai in the German counter attack on General Byng's army, it is reasonably certain that it was there these men were taken or killed.

Fifteen days having elapsed without any of the missing engineers reporting for duty, General Pershing has listed them as missing in action. Previously he had reported fifteen engineers of the same unit, mostly New York men, as having been severely wounded in the same action.

The casualty list of 17 "missing in action" is made up entirely of engineers. It includes one sergeant, one corporal and 15 privates, nearly all of whom were from New York or the neighborhood of that city.

SOME LETTERS FROM THE 13TH ENGINEERS

A number of interesting letters have recently been received from members of the 13th Engineers Railways, United States army, who are now in active service in France. The following excerpts were taken from a letter written by First Lieutenant G. C. Kennedy, now in charge of Company F, "somewhere in France":

"Where our camp now is was two years ago a peaceful farm, but it is now a large terminal yard, feeding the greatest of fronts in the present war. * * * Of the war, I must say that we have it always with us in the hundreds of trains we handle loaded with war supplies, etc., as well as the roar of the big guns in the not so far distance—all the time calling us to hurry.

"To our right, not half a block away, is one of the largest French base hospitals, where all the time are hundreds of suffering patients. And here daily many wonderful operations are performed. Men with half their faces shot away are given new faces and in a few weeks are again sent away to fight for France—very wonderful skill, that of the French surgeons.

"Right at our back door we have a beautiful and quiet resting place, where are buried men of every nation, even to our own. John E. Newlin, an American ambulance man, and a former Princeton student, is buried here, and on his cross is written 'Died for France.'

"We have been having the regular rainy season now for over a month. It is sure becoming very cold, and, even worse, it has caused our bombproof caves to fall in. Heaven only knows what we will do when the all too friendly Mr. Boche comes over again."

"THIS LIFE IS SURE EXCITING"

E. P. Dudley, formerly a despatcher on the Atchison, Topeka & Santa Fe at La Junta, Colo., and now a member of Company F of the Thirteenth Engineers, wrote in part as follows:

"We have 48 carded trains each way every day. About 7 miles is double track, and the balance of the 65 miles is single track. We are living in barracks here, in a little valley hidden between large hills. I have not yet found out that we are hidden any, as the Germans seem to know all about us—judging from the way they treat us. We have a large terminal here with many engines.

"We have beautified the countryside with long deep trenches, built at a convenient distance to our quarters. It is very necessary that we can make our way there in the dark, as we hunt them many times during the night, especially during the past two weeks when the moon has been full. Heinie comes over every night and throws apples at us, and the apples burst all over you if you are not in a trench. We get the signal from the lookout balloons on the hill that he is coming, and then we make a marathon for the ditch. I did not have my clothes off for four days last week, but I am an artist now at dodging the apples. They sure muss up the country.

"This life is sure exciting. I was on the road doing special work, and was at a certain town on the road when they shelled it. I lay on my stomach in a ditch for five hours. It was sure fun, with duck hunting as nothing in comparison."

ALMOST NEVER A "BAD ORDER"

Sergeant L. L. Trager, in a letter written on October 15, gives some interesting details concerning French railroad equipment and operating methods:

"The stations are close together and the track is in the very best condition, with never an engine failure. The

trains always reach their destinations on time. This is made possible by small trains, easy schedules and careful trainmen. There being no competition, it is not necessary to burn the wind to make the trip quicker than the other fellow. Munitions, etc., are started in plenty of time, so that there need be no cause to rush. Small trains and plenty of them, 35 to 50 (sometimes 60) cars—but not American cars. The gross tonnage per car will average about 20. Cars weigh 7 to 10 tons and generally load about 8 to 15 tons. Some of them have a load limit of 10 tons. They are queer-looking cracker boxes, with one pair of trucks under each end, and the wheels are not solid. They have spokes, so to speak. With only four wheels they look like a buckboard. We all had a good laugh at them at first—chain and hook couplers, great large bumpers at each corner of the car. I say we laughed at them at first, but since working with them we have more respect for them. They always fulfill their mission. Almost never a 'bad order.' No hot boxes or draw-bar trouble.

"The engines are about the size of Prairie types and are real up-to-date looking. Brass bands around the boiler jackets make them look real classy, and they are kept in the pink of condition. Some of them have left-hand drives, some right. As you probably know, on double track in England and France the trains move on the left rail instead of the right. I understand there is American equipment on French soil, but I have seen none. The track in this country is in fine shape, well ballasted, heavy rail—about 85 pounds—so speaking summarily, we have a whole lot better outfit to work with than I expected."

LOCOMOTIVES BUILT IN 1861

Captain V. H. Hagelberger, of Company B, compliments the French on the condition of their locomotives, track and roadbed:

"Two weeks ago we took charge of the military railroad supplying the front lines on one of the important battle fronts in France. This is a busy line and a great many difficulties in operation that we have to familiarize ourselves with. Our track and roadbed is fine and in good condition, and we are using engines that were built as far back as 1861 which are in remarkably good condition considering their age. However, they are much better built than the locomotives in the States, as a great many of them have copper fireboxes and brass linings in the machinery. There was evidently plenty of this kind of material when these locomotives were built and it didn't cost very much. At some places we have metal ties and in nearly every instance we have screw spikes. Most of the business is carried on at night here owing to the advantages darkness would have in a locality of this kind. We are getting along first rate, working in the dark, but such is war and I am sure that we will make a go of it. In fact, the people whom we relieved consider we are doing remarkably well in the short time we have had it."

A UNIQUE COALING PLANT

The problem of the economical handling of coal at branch lines or junction points where only one or two locomotives are coaled daily is often difficult to solve. The expenditure necessary to install a modern coaling plant at such points is not warranted and often no special facilities are provided. Where locomotives are coaled directly from the cars it is not an unusual sight to see a train crew stand for half an hour or more while a gang of laborers shovels coal on the tender. At such points not only are trains delayed but the coal cars are held and a considerable number of laborers is required to handle the fuel.

An interesting installation of a small coaling station designed to overcome these objections has recently been constructed by the Georgia & Florida, Nashville, Ga. Nashville is the junction point with a branch line on which there

are two trains a day and it is also the turning point for a local freight train. Prior to the installation of the present facilities, these trains were coaled by hand directly from the cars. This made it necessary to have one or two coal cars always on hand. In designing the new plant the object was to avoid the necessity of keeping cars standing under load at the junction, to eliminate the loss of time by locomotives and crews and to reduce the labor required to a minimum. While the installation is simple and of a type that can be employed only where the amount of coal handled is small, it has given very good results at this point.

The plant at Nashville consists of an inclined spur track 300 ft. long, parallel with the main line and 32 ft. from it. At the end of the spur is a trestle 6 ft. high and 70 ft. long. The space under the trestle is floored. Near the end of the trestle is an elevator of the hand power carriage type, with a platform 6 ft. by 14 ft. The elevator has a capacity of 3,000 lb. and can be raised to the height of the coal platform beside the tracks, which is 14 ft. above the rail, 16 ft. wide and 32 ft. long.

Only one man is employed in operating this coaling sta-



Coaling Station at Nashville, Ga., Operated by One Man

tion. The coal is received in hopper bottom cars and after the cars are placed on the trestle it is dumped directly on the floor beneath. It is then loaded by hand into coal buggies which have a capacity of one ton. After the buggies are filled they are rolled onto the elevator and hoisted by hand to the level of the elevated platform. They are then placed in a position from which they can readily be dumped on the tender of the locomotive. Eight tons of coal can be placed on the platform at one time. As the coal is loaded in the buggies and in position for dumping when the train arrives, the tender can be filled by the fireman and the coal handler in three minutes.

From 18 to 20 tons of coal are handled daily at this plant. By releasing the coal cars promptly, the per diem on two cars is saved. The delays to locomotives have also been eliminated and the cost of labor has been reduced considerably. The cost of the installation including the trestle, platform and elevator, but not the coal buggies, was about \$1,600. We are indebted to E. B. Eppes, chief engineer of the Georgia & Florida Railway, for the details of this plant.

RAILROAD SHELTERS PUBLIC FROM AIR RAIDS.—The London & North Western Railway has placed at the disposal of the authorities, for use by the public at times of air raids, the twin tunnels under Primrose Hill, built, but not yet opened, for the electric railway between Chalk Farm and Queen's Park. The tunnels are about a mile in length, and will accommodate thousands of people.

Settlement of Railroad Problem Delayed

No Action on Part of President; Congress Takes Holiday Recess; Coal Situation a Troublesome Question

WASHINGTON, D. C., December 18, 1917.

APPARENTLY President Wilson is either still trying to make up his mind as to what to do with the railroad problem and intends to leave it up in the air over the holidays, or he has decided to take over the roads for operation under the direction of a government controller under the authority conferred by the law of August 29, 1916. Without any definite knowledge it had been assumed by almost everyone in Washington in touch with the question that the President had decided to take over the railroads, and that he would make the announcement in a message to Congress recommending the necessary legislation; but Congress took a holiday recess on December 18 until January 3 without having received any word on the subject from the White House.

This has caused the railroad men whom the President has kept "watchfully waiting" to fear that he may soon exercise the emergency authority he already possesses to put the roads under the control of a government controller or "transportation dictator", leaving the complicated problems involved in the question as to how the companies are to be compensated for Congress to amuse itself with during the long winter afternoons. While the spectacle of Congress wrestling with the question of guaranteeing railway net earnings for the period of the dictatorship may also promise some entertainment for the spectator who has only an extraneous interest in the subject, it holds forth no pleasing prospect for the railway security holder or executive.

They recall very well that a so-called "eight-hour" law was passed, obligating them to pay out some millions of dollars a year in additional wages, and that some recommendations were made as to ways of assisting them to raise the necessary millions and as to making a recurrence of the circumstance impossible. They are reminded of the law with the recurrence of each monthly or semi-monthly pay-day, but they hear no more of the recommendations for compensating them for the expense, or for making a recurrence of the strike threat impossible.

Until Congress recessed for its holidays it had been the hope and expectation that if the President had decided to take over the roads he would ask Congress for a new law prescribing to some extent the conditions under which they should be taken and that the bargain would be made at least by the time the goods were delivered. Doubtless, the President could if he chose take over the roads under the law of August, 1916, but it was never understood that that law, comprising a single paragraph, inserted almost as an afterthought at the end of an appropriation for the National Guard, was intended for the purpose of taking over the entire railroad system of the United States. It has always been supposed, and the wording of the brief paragraph itself suggests, that it contemplated merely a commandeering of a railroad here or there for purely military purposes, for it contains not a word about compensation either of the employees or of the owners, nor does it prescribe their status in any way.

The alternative recommendation of the Interstate Commerce Commission specifically assumed, and the President is supposed to have recognized its justice, that if the government should take control of railroad operations the security holders should be guaranteed an adequate annual return while their interests were being subjected to the process of unification. Any other terms would amount to confiscation, particularly as the only reason advanced for the exercise of government control is the theory that the

railroads themselves are too greatly fettered by the constant reminder of private individual interests to be expected to succeed in unifying themselves. Unless it is proposed to do something with the railroads which would seriously affect the interests of the owners of different lines for the purpose of increasing the efficiency of the transportation system as a whole, railroad men cannot understand just what they can be expected to accomplish under the orders of a government administrator that they cannot do under the direction of the organization whose orders they have already agreed to comply with, that of the Railroads' War Board.

They have heard suggestions that with the magic wand of the President's delegated authority in one hand, while the other is occupied with printing, selling and collecting for billions of Liberty Bonds, a Cabinet officer may be expected to create 125 per cent transportation efficiency almost overnight. Fuel Administrator Garfield has allowed the impression to percolate into the public prints that with almost any kind of a government administrator for the railroads the entire problem of coal production, transportation and even unloading, cartage, distribution and prices might be solved so easily that he, too, would have an extra hand free to place at the disposal of, perhaps, the Food Administration.

Practical railroad men have heard these suggestions and are still rather curious to know how all of these simple little miracles are to be accomplished without more cars, tracks or locomotives and how the aforesaid appurtenances which they have been educated to believe are almost indispensable to the speedy transportation of freight are to be procured without some form either of cash or of credit.

After nearly two weeks of rather continuous reflection, many of them have attained a state of mind in which they are not so reluctant to be shown as they have sometimes been accused of being, but they cherish a lively curiosity as to when the demonstration is to begin and they are hoping for more action at the outset than can reasonably be anticipated from a Congressional debate. With a guarantee of net earnings patterned after the plan adopted in Great Britain, particularly if it should be based on the earnings of 1916, and with some assistance from the government in the way of priority orders for cars, locomotives and materials, it is believed that many roads would be able to finance on their own credit all of the expenditures that could reasonably be expected to be made at such a time, but if the President should seize the roads now and leave the terms for settlement by Congress at some later time, the effect on those who have thus far put up the capital to produce the transportation plant would be discouraging indeed.

It has been suggested that possibly the failure of the President to act as promptly as had been expected may be due to a growing doubt as to the desirability of such a drastic step as it has been assumed he was about to take, at least until the present plan has had a further trial, and that he may come to the conclusion that with a long, hard winter ahead, the present organization will be able to attain as near complete success as can reasonably be expected. One of the important causes to which railroad men have attributed the congestion of some of the eastern lines, the indiscriminate use of preference orders for all government freight, has recently been brought under control as the result of the agitation about it.

The watchful waiters at Washington received somewhat

of a surprise last week as to the attitude of the railroad brotherhoods toward the idea of government control. It had been rather generally assumed that because of their opposition to government ownership they would oppose the plan. It was given out that the heads of the four organizations were to call on the President last Wednesday, and the result was awaited with interest. Instead of coming themselves, however, they sent their four legislative agents who are stationed in Washington, H. E. Wills, representing the engineers; P. J. McNamara, the firemen; W. M. Clark, the conductors, and W. N. Doak, the trainmen. Their visit was brief and no announcement was made, but on the following day, A. B. Garretson, president of the Order of Railway Conductors, called at the White House and it was announced that he had stated that the brotherhoods would have no objection to make. One opinion advanced at the time was that this announcement would remove the last trace of hesitation in the President's mind as an important obstacle eliminated.

In view of the demands of the brotherhoods for higher

be sufficient inducement for them to accept the control of even a government administrator with a good grace.

Such a settlement would leave open only the question as to whether the government should pay the increased wages, through the medium of guaranteed net earnings, or whether they should be met currently by higher rates. In the former case the higher wages might easily survive to present another problem after the war and after the expiration of the guarantee, a contingency which the railroads would prefer to avoid. The other alternative would follow the policy of pay-as-you-go, which is distasteful to many people.

Senator Borah of Idaho made a vigorous protest in the Senate on Monday against an adjournment without taking some action on the railroad situation. He said that at least Congress should remain in session to give the President a chance to deliver his message. There is much speculation as to who the prospective railroad administrator will be and the Washington correspondents have compiled a long list of candidates. The two most frequently mentioned are W. G. McAdoo, Secretary of the Treasury, and Franklin K. Lane, Secretary of the Interior and former Interstate Commerce Commissioner. Daniel Willard and Judge R. S. Lovett have also been mentioned because they are railroad men who are taking an active part in the government's war work, but it has been stated rather positively that no railroad man would be chosen. Others have been mentioned for the reason that they have happened to call at the White House recently and there has also been a rumor that Justice Brandeis had declined with thanks. The name of Dr. Arthur T. Hadley has also been suggested.

The Senate on December 18 adopted a resolution by Senator Cummins providing for an investigation by the Committee on Interstate Commerce for the purpose of considering the recommendations of the Interstate Commerce Commission in its special report. The committee was instructed to report legislative recommendations as soon as possible.

Senator Newlands made no objection to this resolution, saying that the President is still engaged in investigation of the question. Senator Sterling introduced a resolution, which was referred to the committee on interstate commerce, providing for the appointment of a general railroad traffic director to exercise general supervision and direction over the handling and movement of all freight trains engaged in transportation of products essential to the public welfare. In the house Representative Lenroot introduced a bill providing for the creation of the United States Equipment Corporation to acquire railroad equipment and lease it to the railroads.

COAL OPERATORS STILL AFTER PRIORITY

Not satisfied with the position accorded coal in the latest government priority order, which gives livestock, perishable freight, foodstuffs, and in some cases military supplies, precedence over coal, the National Coal Association, representing bituminous coal operators, have been trying to persuade Fuel Administrator Garfield to secure a preference order as to coal from President Wilson.

Resolutions by the directors of the association, which have been presented to Mr. Garfield, assert that in practically all coal regions there is enough labor to produce much more coal than the railroads are now moving, and that the coal operators are powerless to produce more coal until greater transportation facilities are provided.

The latest priority order, No. 5, they say, gives no additional preference in car supply to coal mines and no special priority over most other commodities, sufficient to relieve the immediate coal shortage.

The Fuel Administrator was urged to secure from the President "an order to the effect that such an immediate priority be given the movement of coal now under load as will relieve the present emergency, and that further, for the



Stuck!

New York Tribune

wages, which their officers had already discussed with the President, and in connection with which the railroads had placed their own interests unreservedly in the hands of the President, an interesting solution of the entire wage question immediately presented itself. Aside from the interests of the railroads, already beyond their control, the idea of a tacit understanding between the brotherhoods and the President appeared quite feasible. The idea of this understanding contemplated an agreement for arbitration which might be entirely acceptable to the brotherhoods. In spite of their well-known disinclination to arbitrate they have never flatly rejected the entire principle of arbitration, and it was suggested that an arbitration as to what the recent cost of living has amounted to, following an agreement that wages should be increased by that amount when determined, might

next 30 days preference be given coal mines in the distribution of cars to the extent that may be necessary to operate all mines continuously at full capacity for the next 30 days, so as to supply at all points the amount of coal necessary to preserve the life and health of the people of this nation, and to rush with all possible speed the powder mills, cartridge mills, steel mills, and all other mills and manufacturing plants that are producing ships, guns, ammunition, food and clothing for our soldiers, and all the other supplies and equipment that are vitally essential to drive this war through to a victorious conclusion."

In an address at the Editorial Conference of the Associated Business Press last week Dr. Garfield asserted that with a government transportation administrator in office it would be a simple matter to secure such an order, but no announcement has been made that he has been able to convince the President that it should be issued.

Dr. Garfield continues to endeavor to place the blame for failure to secure the needed increase in coal production upon the railroads, asserting that the coal supply of the country is ample "if we could but solve the question of transportation."

According to the weekly report of the Geological Survey the output of bituminous coal for the week ended December 8 was 11,133,220 tons, and the nine anthracite roads originated 40,566 cars. A general easing up in the shortage of cars was reported from Illinois, Indiana, Ohio, Pennsylvania and Kentucky. In West Virginia, on the other hand, losses due to inadequate transportation were even more severe than during the preceding week. Car shortage was responsible, according to the report, for a loss of 19.6 per cent of the full time capacity.

The railroad situation in the country with particular reference to coal transportation was the subject of a conference on December 15 between United States Fuel Administrator Harry A. Garfield and A. W. Thompson, chairman of the General Operating Committee of the eastern railroads. One result of the presence in Washington of Chairman Thompson and of his recommendations was announcement of the appointment by the fuel administration of C. R. Moriarty of Cleveland as the fuel administration's representative to exercise such powers and authority as may be necessary to enable him to perform all of the duties of general director of the coal shippers' terminal pool association. Mr. Thompson reported that while the railroad committee which is working to relieve railroad congestion in the Pittsburgh terminal territory has made great progress the full effects and benefit of this will not be entirely apparent for some days.

RAILROADS NOT RESPONSIBLE FOR COAL SHORTAGE.

Fairfax Harrison, chairman of the Railroads' War Board, has authorized a statement saying that shortage of coal is due chiefly to the enormous increase in the demand for coal and to other causes, but it cannot fairly be attributed altogether to lack of transportation.

"The railroads appeal from the general statements being made upon this subject to the incontrovertible facts," he said. "The records of the railroads show not only that the coal operators have produced more coal than ever before, but that in the eight months, April to November, inclusive, the railroads have hauled and delivered 175,986 more carloads, or about 10,000,000 more tons of anthracite than in the same months of 1916. This was an increase of 15 per cent over the best record ever previously made. The records show that in the same months the railroads hauled 925,691 more carloads, or about 51,000,000 more tons of bituminous coal, than in the corresponding period of 1916. This was an increase of 18 per cent over the best record ever previously made.

"The railroads have not been able at all times to carry all the coal that could be offered to them for movement. But

has any other industry responded more efficiently to the demands created by the war than these statistics regarding coal transportation show the railroads have? And the railroads have accomplished what they have under the greatest difficulties—difficulties resulting principally from their inability to increase their plant and the excessive use of preference orders in government transportation.

"The charge has been made that the inability of the railroads promptly to move all the freight offered to them has been largely due to failure of the various railway lines to work together harmoniously and unitedly in this war crisis. We challenge those who make this allegation to cite any evidence in support of it. They cannot do so. The allegation is without foundation. The railways, under the organization they voluntarily formed to direct the operation of their properties during the war, have without exception acted on every suggestion the Railroads' War Board has made to increase the amount of traffic moved.

"The present coal problem is not, as has been represented, altogether a problem of transportation. It is primarily a problem of distribution, for which the public must share the responsibility. The railroads cannot, with their existing facilities, handle a much larger tonnage of coal so long as the present system of distribution prevails. The present system of distribution involves a great amount of cross-hauling of coal, and a resulting large waste of transportation. The remedy doubtless requires surrender of convenience and old habits, but it is clear. It is to cause coal to be supplied to every section from the mines nearest to that section. No one unacquainted with the facts can conceive the unnecessary long hauls of coal which have grown up under the right of the shipper to route his traffic as he pleases. Whatever may be its justification in normal times, this practice effectively reduces the efficiency of the transportation machine in the time of heaviest traffic ever experienced."

SIMS CHAIRMAN OF HOUSE COMMITTEE

W. C. Adamson, for several years chairman of the House Committee on Interstate Commerce, has resigned from Congress to become a member of the board of appraisers of the port of New York, and Thetus W. Sims, of Tennessee, has been elected chairman of the committee and also vice-chairman of the Joint Committee on Interstate Commerce to succeed him. Dan V. Stephens of Nebraska succeeds Mr. Adamson as a member of the two committees.

A CHANNEL FERRY between Newhaven, England, and Dieppe, France, is the subject of an article by Colonel Barry in the Railway Gazette of London, issue of November 16, 1917. He urges the installation of such a train ferry at once, for even though the proposed tunnel from Dover will be constructed after the war, a train-ferry as suggested would have the same stimulating effect on international trade as is expected of the tunnel, while the ferry could be constructed in twelve months whereas it would take more than ten years to build the tunnel.

SALES OF NATIONAL FOREST TIMBER in the fiscal year 1917 were more than double those of 1916, according to the annual report of the Forest Service of the U. S. Department of Agriculture. The total amount sold exceeded two billion feet and is valued at more than \$3,715,000. During the same period about 727 million feet were cut and removed, for which the purchasers paid \$1,507,303 into the Federal Treasury. The largest sales were made in Oregon, where about 688 million board feet were disposed of. In addition to the timber sold, approximately 113 million board feet valued at almost \$150,000 was cut under free use permit by more than 41,000 settlers living near the national forests and depending on the forests for firewood and building material to improve their homesteads.

General News Department

Following the severe winter weather of last week, the Pennsylvania Railroad sent from its shops at Altoona, to different division points on the road, about 300 men, to repair locomotives.

The Pullman Company has granted a bonus of 10 per cent of their pay for the past six months to office employees who receive less than \$2,500 a year and to Pullman conductors and porters.

The Interborough Rapid Transit Company, New York City, will pay a Christmas bonus of \$5 to each employee who has been in the service one year and whose regular pay is less than \$150 a month.

Thirty locomotives built at the Baldwin Locomotive Works, Philadelphia, for military railroads in France have been ordered by the Government to be put in use on the Philadelphia & Reading, the Pennsylvania, the Baltimore & Ohio, and the Lehigh Valley.

The Erie Employees' Relief Association, a benevolent association composed of the employees of the Erie Railroad, appears to be insolvent. Application was made to the court at Buffalo, N. Y., December 18, for the appointment of a receiver. This association was formed in 1911, and the report indicates that pensions have been paid to retired employees on a basis more liberal than was justified by the receipts and assets of the association.

It is announced that a large share of the Christmas presents sent to soldiers have been safely landed in France and are being distributed through the various military postoffices. Over 600,000 separate parcels, weighing approximately 1,000,000 lb., were shipped from one Atlantic port before December 5. Large shipments were made from other eastern ports; and the Christmas parcels for soldiers and sailors at the various camps or cantonments in this country probably weighed over 2,500,000 lb.

The 416th Battalion, of the United States Signal Corps is being recruited at Grand Rapids, Mich. The battalion is one of several which are being organized to take over the telephone and telegraph departments of the railroads now being operated by American railway units in France. During the illness of Major P. Kirk Pierce the recruiting work at Grand Rapids is being carried on under the direction of Major N. D. Ballantine, who recently left his position as assistant to the vice-president of the Chicago, Rock Island & Pacific at Chicago to relieve Major Pierce until his recovery.

Students from the department of transportation of the University of Illinois made a railway inspection trip in Chicago from December 18-21. The itinerary included visits to the passenger department of the Chicago, Burlington & Quincy, the Western Passenger Association, the Pullman Company, the freight tariff bureau and the development department of the Illinois Central, the freight claim and general freight departments of the Chicago, Burlington & Quincy, the Central Freight Association and the offices of the general auditor and controller of the Chicago, Rock Island & Pacific.

The Firemen's Wage Demands

Representatives of the Brotherhood of Locomotive Firemen and Enginemen held conferences at Chicago on December 15, 17 and 18, to prepare wage scales and working rules to present to the railroads.

The schedules were completed on Tuesday. The increases asked for range from 10 per cent for the higher-paid men to 40 per cent for those receiving \$2.50 for eight hours or 100 miles or less. All receiving more than the guarantees decided on want 10 per cent additional guarantees as follows: Firemen in passenger service per 100 miles, \$3; passenger firemen, not paid on a mileage basis, \$3.50 for eight hours; all classes except those in passenger and switching service, \$3.50 for 100 miles or less; those in switching service, \$3.50 for eight hours; helpers in electric service, \$3 for eight hours; inside hostlers, \$3.50 for eight hours;

outside hostlers, \$3.75 for eight hours, and their assistants, \$3.50. In all classes of road service, except passenger, they will ask time and one-half when runs are 100 miles or less. Time and one-half is also to be asked in switching service for all time above eight hours in each twenty-four.

St. Paul Union Station

The sinking of the foundation piles for the head house of the St. Paul (Minn.) Union station is now under way. The head house will be 150 ft. by 300 ft. and two stories in height, except over the main entrance, where the height of the building will be three stories. In addition, a waiting room, 375 ft. by 65 ft., will extend over the tracks. The exterior of the building will be of Bedford stone. The contract for the construction of the head house, for the grading for the elevation of the tracks, the building of retaining walls and the relocating of tracks, etc., is held jointly by the George J. Grant Construction Company and Morris, Sheppard & Dougherty, both of St. Paul. The estimated cost of the entire project is about \$15,000,000.

"Stop, Look and Loosen"

This was the legend on the front of the float of the Canadian Pacific Railway in the Victory loan parade in Montreal on Monday, November 19. The float, as shown in a picture published in the company's passenger bulletin, looks like a large passenger engine, with a tender; but in reality it is an effigy, made at the Angus shops in about 2½ days. Large banners, urging the purchase of bonds, covered the lower part of the "locomotive," so that the designers and artisans had to make the similitude of an engine only for those parts above the level of the tops of the driving wheels. In the parade the engine was manned by an engineman and a fireman, and also by "three of the prettiest lady workers at the shops, dressed in overalls."

Printing Telegraphs on Railroad Wires

The Telegraph & Telephone Age, in its issue of December 16, reports data from 70 prominent railroads of the United States and Canada showing the mileage of line, on each road, on which telephones are used for train despatching; and also the mileage of circuits on which printing telegraphs are used. The total length of road on which the telephone is used is 94,625, and of circuits on which printing telegraphs are used, 12,499. This last mentioned figure is made up as follows:

Name of Road	Name of System	Miles
Canadian Pacific	Morkrum	7,154
Chicago, Burlington & Quincy	Morkrum	659
Delaware, Lackawanna & Western	Am. Telegraph & Tel. Co.	150
Missouri, Kansas & Texas	Morkrum	381
N. Y. Central, E. of Buffalo	Am. and Morkrum	570
N. Y. Central, W. of Buffalo	Morkrum	113
Pennsylvania	Morkrum	585
Pennsylvania, W. of Pittsburgh	Morkrum	1,129
Southern Pacific	Morkrum	1,266
Union Pacific	Morkrum	492

On the Pennsylvania the Wright printer is in operation between Philadelphia & Pittsburgh, 350 miles; and the Morkrum between Philadelphia & Altoona, 235 miles. Several other printing circuits are to be put in service on this road in the near future.

Axioms—For Railroad Men and Others

Unnecessary work is unnecessary expense.

An unnecessary job increases the work of every other job.

Unnecessary work shortens the time that should be devoted to necessary work.

The handling of unnecessary correspondence reduces the time that should be devoted to necessary supervision.

To answer a foolish question takes the time that may be devoted to asking a sensible one.

Information required that is not used is the worst form of inefficiency.

Authority decreases as it is divided and is weakened every time it is transmitted.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF OCTOBER, 1917

Name of road.	Average mileage operated per period.	Operating revenues.			Maintenance of way and structures.			Operating expenses.			Operating ratio.	Net from operation.	Railway accruals.	Operating (or loss).	Increase (or decrease) last year.
		Freight.	Passenger.	Total.	Inc. mile.	Way and structures.	Equip.	Traffic.	Trans- portation.	General.					
Ann Arbor	301	\$193,435	\$44,934	\$238,369	\$257,214	\$24,204	\$33,556	\$8,041	\$131,805	\$9,803	73.48	\$68,223	\$13,100	\$55,123	\$21,077
Atlantic City	170	110,786	98,106	208,892	37,112	18,151	2,084	2,084	131,008	914	83.71	368,597	11,000	25,897	15,331
Belt Ry. Co. of Chicago	31	108,592	14,213	122,805	35,609	44,390	1,374	1,374	151,893	7,968	75.10	87,807	13,898	73,909	36,861
Belt Ry. Co. of Chicago & Orient of Texas	465	108,592	14,213	122,805	35,609	44,390	1,374	1,374	151,893	7,968	75.10	87,807	13,898	73,909	36,861
Louisiana Western	207	261,612	395,392	657,004	38,911	8,064	71,537	8,064	71,537	140,355	37.77	232,116	13,740	222,116	108,128
Morgan's La. & Tex. R. & S. S. Co.	400	492,418	150,622	643,040	64,362	62,750	12,866	12,866	140,355	140,355	49.87	339,696	30,525	308,825	183,164
Morgan's La. & Tex. R. & S. S. Co.	400	492,418	150,622	643,040	64,362	62,750	12,866	12,866	140,355	140,355	49.87	339,696	30,525	308,825	183,164
Oregon Short Line	2,306	2,195,791	568,552	2,764,343	150,419	312,666			729,942	73,536	45.10	1,638,608	333,289	1,305,289	272,319
Oregon-Washington R. & Nav. Co.	2,070	2,147,680	529,611	2,677,291	150,419	312,666			729,942	73,536	45.10	1,638,608	333,289	1,305,289	272,319
Port Reading	1,211	1,110,644	223,580	1,334,224	61,470	30,261	10,960	10,960	245,436	21,116	89.80	1,187,599	178,158	1,009,441	589,455
Pittsburgh, Shawmut & Northern	204	99,019	5,649	104,668	107,964	22,224	43,455	1,365	48,507	8,956	114.49	156,143	1,813	154,330	15,570
St. Louis, San Francisco & Texas	143	77,230	28,562	105,792	13,935	18,533	2,381	2,381	47,465	14,162	77.53	95,910	1,491	94,419	1,700
San Antonio & Western	723	282,019	102,364	384,383	31,149	37,734	7,331	7,331	104,963	23,965	71.38	311,558	15,000	296,558	87,689
Toledo, Andover & Western	247	74,202	35,384	109,586	14,602	34,751	2,192	2,192	44,905	16,021	81.90	22,151	8,000	14,151	16,811
Utah & Delaware	128	52,337	13,960	66,297	14,437	11,406	763	763	45,031	3,237	75.152	7,512	6,000	1,512	6,489
TEN MONTHS CALENDAR YEAR, 1917															
Ann Arbor	294	\$1,864,286	\$457,263	\$2,321,549	\$2,644,435	\$236,400	\$398,654	\$61,928	\$1,158,845	\$91,405	74.68	\$661,929	\$131,000	\$530,929	\$47,814
Atlantic City	170	1,007,731	700,139	1,707,870	322,468	127,468	13,779	13,779	1,479,317	121,162	71.17	1,972,761	69,477	1,903,284	135,906
Belt Ry. Co. of Chicago	31	1,007,731	700,139	1,707,870	322,468	127,468	13,779	13,779	1,479,317	121,162	71.17	1,972,761	69,477	1,903,284	135,906
Georgia	334	2,374,937	895,166	3,270,103	334,026	273,021	494,290	139,648	1,289,631	92,689	68.24	1,063,970	59,128	1,004,842	201,064
Georgia Southern & Florida	402	2,374,937	895,166	3,270,103	334,026	273,021	494,290	139,648	1,289,631	92,689	68.24	1,063,970	59,128	1,004,842	201,064
Grand Rapids & Indiana	575	3,569,681	1,434,957	5,004,638	663,741	963,370	103,775	244,303	193,690	4,385,486	79.94	1,100,816	334,206	766,610	101,506
Grand Trunk Western	347	5,998,816	1,600,284	7,600,100	1,469,103	1,649,103	164,561	3,492,468	203,889	6,355,667	79.37	1,652,451	372,350	1,280,101	997,826
Gulf, Colorado & Santa Fe	8,063	33,447,251	13,313,728	46,760,979	10,270,253	9,262,833	9,262,833	1,052,840	2,550,034	1,284,831	66.43	24,703,143	4,818,411	19,884,732	1,186,984
Gulf, Colorado & Santa Fe	1,937	10,196,596	2,907,698	13,104,294	2,596,502	1,985,700	295,948	4,560,156	542,732	9,955,688	70.93	4,078,766	605,089	3,473,677	422,100
Gulf, Mobile & Northern	402	1,727,831	269,006	1,996,837	269,006	1,996,837	269,006	40,651	591,432	88,116	67.10	639,129	93,467	545,662	75,391
Houston East & West Texas	191	1,071,018	335,541	1,406,559	191,018	191,018	191,018	22,466	484,554	32,299	59.04	617,733	127,730	489,993	57,487
Houston & Texas Central	930	4,073,003	1,433,110	5,506,113	848,159	763,215	175,527	2,073,475	192,103	4,073,872	65.91	2,401,389	436,458	1,965,931	238,552
Illinois Central	4,766	52,877,927	13,799,249	66,677,176	9,618,667	15,020,235	1,094,641	23,546,438	1,713,518	51,258,636	70.98	20,954,036	4,871,342	16,082,694	2,998,979
Indiana Harbor Belt	109	4,362,529	502,707	4,865,236	502,707	502,707	502,707	28,799	214,274	100,284	76.37	1,030,788	85,204	945,584	275,532
International & Great Northern	1,160	6,933,548	2,452,688	9,386,236	1,830,426	1,637,812	226,107	3,705,569	310,700	7,004,837	69.51	3,073,045	311,638	2,761,407	485,874
Kansas & Michigan	340	1,071,018	335,541	1,406,559	191,018	191,018	191,018	22,466	484,554	32,299	59.04	617,733	127,730	489,993	57,487
Kansas City Southern	755	7,904,664	1,435,622	9,340,286	1,435,622	1,435,622	1,435,622	234,706	3,164,960	336,722	61.14	3,952,066	558,590	3,393,476	502,891
Lake Erie & Western	900	5,003,114	500,773	5,503,887	795,641	1,144,345	137,385	2,656,490	151,477	4,865,311	71.61	1,929,242	303,500	1,625,742	386,847
Lehigh & New England	296	2,123,871	348,866	2,472,737	369,114	436,363	28,446	938,853	99,739	1,881,422	60.98	1,203,914	165,100	1,038,814	140,707
Lehigh Valley	1,442	3,871,662	4,657,278	8,528,940	5,017,332	7,987,940	819,637	19,524,411	957,827	34,452,422	76.67	10,483,558	786,456	9,697,102	1,034,445
Long Island	397	3,871,662	4,657,278	8,528,940	5,017,332	7,987,940	819,637	19,524,411	957,827	34,452,422	76.67	10,483,558	786,456	9,697,102	1,034,445
Los Angeles & Salt Lake	1,154	6,792,435	2,986,591	9,779,026	1,154,026	1,154,026	1,154,026	327,984	3,022,681	235,356	60.08	4,218,725	579,720	3,639,005	97,935
Louisiana & Arkansas	302	1,020,661	212,217	1,232,878	123,217	123,217	123,217	38,434	300,898	44,036	71.21	369,428	101,621	267,807	61,543
Louisiana Ry. & Navigation Co.	342	1,232,878	348,866	1,581,744	260,926	222,983	63,997	731,340	66,269	1,415,515	71.08	575,046	123,545	451,501	1,448
Louisiana Western	5,070	13,642,347	3,627,678	17,270,025	2,715,104	3,355,634	1,277,987	20,263,113	1,379,754	13,797,617	46.61	13,600,907	352,535	13,258,372	441,141
Louisville & Nashville	5,070	13,642,347	3,627,678	17,270,025	2,715,104	3,355,634	1,277,987	20,263,113	1,379,754	13,797,617	46.61	13,600,907	352,535	13,258,372	441,141
Louisville, Henderson & St. Louis	200	1,441,464	404,891	1,846,355	235,113	228,262	49,277	609,337	35,500	1,157,489	62.83	684,640	57,000	627,640	212,456
Maine Central	1,626	1,796,168	1,392,091	3,188,259	4,692,091	4,692,091	4,692,091	71,900	18,328,454	282,951	73.84	3,104,710	592,214	2,512,496	595,819
Midland	332	1,783,661	1,094,841	2,878,502	500,799	299,555	30,119	732,384	84,676	1,646,965	69.22	1,732,384	155,045	1,577,339	314,884
Minneapolis & St. Louis	1,626	6,823,558	1,610,378	8,433,936	1,368,987	1,368,987	1,368,987	178,243	3,733,557	228,016	72.23	2,508,428	448,128	2,059,845	524,434
Missouri	4,238	21,301,352	5,654,096	26,955,448	4,005,899	479,091	10,555,273	684,711	18,954,665	65,651	9,937,186	1,263,940	8,671,091	3,114,989	1,144,989
Missouri & North Arkansas	365	740,547	272,024	1,012,571	206,268	191,602	49,813	424,224	33,637	938,896	77.13	258,321	55,410	202,911	47,708
Missouri, Kansas & Texas System	5,866	23,051,399	8,703,213	31,754,612	5,418,802	7,016,348	657,552	12,499,942	1,046,709	26,907,942	77.13	7,979,061	1,548,725	6,430,336	2,175,405
Missouri, Oklahoma & Gulf	332	1,224,663	246,283	1,470,946	197,813	275,405	41,994	677,298	73,327	1,127,594	80.78	301,643	91,231	209,608	104,313
Missouri, Oklahoma & Gulf of Texas	84	211,253	4,222	215,475	19,886	17,410	74,102	13,593	146,121	7,375	67.16	71,439	1,836	69,589	50,315
Missouri Pacific	7,302	24,914,734	6,955,845	31,870,579	5,101,486	696,411	10,884,813	737,611	22,258,288	337,611	66.32	11,303,460	1,694,500	9,608,960	3,903,755
Mobile & Ohio	1,160	910,324	1,922,746	3,833,070	2,122,884	2,122,884	2,122,884	37,727	3,918,099	318,994	78.90	2,868,582	516,473	2,352,109	44,317
Monongahela	1,160	1,623,135	142,949	1,766,084	306,140	306,140	306,140	42,762	789,355	42,762	89.34	1,686,668	19,090	1,667,578	180,196
Monongahela Connecting	4	1,623,135	142,949	1,766,084	306,140	306,140	306,140	42,762	789,355	42,762	89.34	1,686,668	19,090	1,667,578	180,196
Monongahela & Tex. R. & S. Co.	600	3,935,519	1,180,922	5,116,441	574,285	740,402	118,337	1,565,219	130,639	3,150,845	57.58	2,331,233	415,692	1,915,541	1,036,158

REVENUES AND EXPENSES OF RAILWAYS

TEN MONTHS CALENDAR YEAR. 1917—CONTINUED

Average mileage operated during period.	Name of road.	Operating revenues.			Operating expenses.			Operating ratio.	Net from railway operation.	Railway tax accruals.	Operating income last year.	Increase (or loss).
		Freight.	Passenger.	Total.	Maintenance of way and equipment.	Traffic.	Transportation.					
1,237	88,581,844 Nashville, Chattanooga & St. Louis.	\$21,810	\$2,277,968	\$52,012	\$4,719,631	\$37,325	\$9,416,239	75.87	\$2,994,613	\$40,000	\$2,552,080	—
1,237	88,581,844 Nashville, Chattanooga & St. Louis.	\$21,810	\$2,277,968	\$52,012	\$4,719,631	\$37,325	\$9,416,239	75.87	\$2,994,613	\$40,000	\$2,552,080	—
1,237	88,581,844 Nashville, Chattanooga & St. Louis.	\$21,810	\$2,277,968	\$52,012	\$4,719,631	\$37,325	\$9,416,239	75.87	\$2,994,613	\$40,000	\$2,552,080	—
1,237	88,581,844 Nashville, Chattanooga & St. Louis.	\$21,810	\$2,277,968	\$52,012	\$4,719,631	\$37,325	\$9,416,239	75.87	\$2,994,613	\$40,000	\$2,552,080	—
1,237	88,581,844 Nashville, Chattanooga & St. Louis.	\$21,810	\$2,277,968	\$52,012	\$4,719,631	\$37,325	\$9,416,239	75.87	\$2,994,613	\$40,000	\$2,552,080	—
1,237	88,581,844 Nashville, Chattanooga & St. Louis.	\$21,810	\$2,277,968	\$52,012	\$4,719,631	\$37,325	\$9,416,239	75.87	\$2,994,613	\$40,000	\$2,552,080	—
1,237	88,581,844 Nashville, Chattanooga & St. Louis.	\$21,810	\$2,277,968	\$52,012	\$4,719,631	\$37,325	\$9,416,239	75.87	\$2,994,613	\$40,000	\$2,552,080	—
1,237	88,581,844 Nashville, Chattanooga & St. Louis.	\$21,810	\$2,277,968	\$52,012	\$4,719,631	\$37,325	\$9,416,239	75.87	\$2,994,613	\$40,000	\$2,552,080	—
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1,237	88,581,844 Nashville, Chattanooga & St. Louis.	\$21,810	\$2,277,968	\$52,012	\$4,719,631	\$37,325	\$9,416,239	75.87	\$2,994,613	\$40,000	\$2,552,080	—
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Figures shown are for period April 1 to October 31.

Car Shortage Reduced

Reports to the Railroads' War Board show that on December 1 the excess of unfilled car orders amounted to 117,132 cars, a decrease of 22,880 compared with November 1, and an increase of only 10,000 cars compared with December 1 a year ago; although the railroads are handling currently at least 20 per cent more passenger and freight business than a year ago.

Illinois Manufacturers' Association Urges Appointment of Transportation Director

The directors of the Illinois Manufacturers' Association have addressed the following telegram to President Wilson:

"We suggest in order to secure more positive control of the transportation situation and as means of securing the operation of all the railroads of the country as a single unit with an obliteration so far as transportation problems are concerned, of all property lines, that the President of the United States appoint a director of transportation who shall select as his operating staff a committee of five railroad officials who shall have immediate charge of the operation of the complete transportation system; that the railroads carry both soldiers and all government war supplies free of charge during the duration of the war, and that in consideration thereof a fair return to the stockholders of the railroads' properties be guaranteed by the government."

Reductions In Passenger Service

Reports just compiled show that since the beginning of the war the railroads in the 15 states of the central military department have made reductions in passenger service aggregating 10,657,637 train miles per annum, equal to a saving of 1,176,085 tons of coal, 369 locomotives, 1,941 men and 203,839 barrels of fuel oil.

The Baltimore & Ohio proposes to take off two express trains each way, daily, between New York and Washington. The Pennsylvania and the Philadelphia & Reading will take off one train each way daily between Philadelphia and Cape May. By the new timetable the Reading will run an express to Cape May in the morning and the Pennsylvania will run one in the afternoon, and a corresponding arrangement will be made for the return trips.

The Louisiana Railroad Commission has authorized the Texas & Pacific to discontinue the operation of nine local passenger trains because of the scarcity of coal. It appears that these are the same nine trains which the road discontinued without the consent of the commission in November and which were restored on December 3.

Fuel Administration Calls for Reduction of Suburban Train Service

The United States Fuel Administration suggests the possibility of saving coal by cutting down suburban steam railroad passenger service during the non-rush hours. On many lines numerous trains are operated at non-rush hours which require only three or four cars for the small traffic handled. Many of these trains are run merely to afford a maximum of convenience through frequency of service. Competent railroad men have informed the Fuel Administration that, on the average, two of these non-rush hour trains could well be made to do the work of three by simply making an interval between trains. One important railroad as an experiment recently decreased its non-rush hour service, or made changes which proved economical without serious inconvenience to the public. This road has announced a further withdrawal of about 10 per cent of the total number of its suburban trains, whereby it will be able to release more than 1,000 tons of coal per month. It is suggested that the railroads do what they can and that the suburban communities, through community action, acquiesce where no great hardship is involved.

Contribution to the Railway Regiments' Tobacco Fund

Three contributions to the Railway Regiments' Tobacco Fund have been received in the week ending with Tuesday noon, December 18:

Dayton Malleable Iron Company, Dayton, Ohio... \$10 a month
Signal Alliance Association, contribution..... 17
J. Alexander Brown, New York..... 10 a month

Webb Bill Passed

The Webb bill, to legalize combinations of American exporters for the purpose of promoting foreign commerce, was passed by the Senate on December 11. It had already been passed by the House, but there were differences and it was sent to conference.

"Your Part"

This is the title of a circular decorated in red, white and blue, which has been issued to the employees of the Norfolk & Western by W. S. Battle, Jr., general claim agent of the road. It says, in part:

"Do you fully realize what this War means? Have you begun to do your duty toward your country? . . . If each one will handle freight as though it were *his own*, waste will practically disappear. It is believed that this company has not a single employee who would willingly cause loss or waste in the present time—*yet waste is still going on*. Do you not think that each one should *bestir himself* and 'deliver the goods'?"

"Do not think your efforts will *not do any good*. Suppose each one decided that his help was too small to count, what would happen? Consider what results could be accomplished if we all pull together.

"Talk over such matters with each other. Get the *habit* of trying to impress someone else with the importance of *protecting the freight of today*. Do this today and tomorrow and keep at it. Do not slack up, but keep trying to obtain better results, and you will soon learn that your efforts are of mutual benefit to your nation and yourself.

"Remember you are either *for* this country or *against* it; and you are against it, regardless of what you may say, unless you clearly show by your work and results that you are helping the nation to conserve its resources."

Mississippi Roads Fight Heavy Tax Assessment

The Illinois Central, the Yazoo & Mississippi Valley and other railroads in Mississippi were granted restraining orders on December 11 by Judge A. C. Niles, of the federal district court at Jackson, Miss., forbidding the Mississippi Railroad Commission to enforce tax assessments against the roads for 1917. With the creation of a new equalizing body in that state, taxes on general property were increased about 43 per cent. The assessment of railroad property, which, the carriers claim, was 100 per cent of its true value in 1916, was increased from \$64,000,000 to \$98,000,000. The increases for the Illinois Central and the Yazoo & Mississippi were alone \$10,000,000 and \$7,500,000, respectively, or about 66 per cent. The increase in the assessment of the property of the St. Louis-San Francisco amounted to about 50 per cent, and the increases in the assessments of other roads were likewise very large. The carriers maintain that the increase in the assessment of general property only brings it up to about 57 per cent of its value, whereas the increase in the assessment of railroad property puts it considerably above 100 per cent of its value, and in the cases of the Illinois Central and the Yazoo & Mississippi Valley as high as 166 per cent. The railroads contend that their property should be assessed on the same basis as that of other property, and on January 4, will appear in the United States District Court at Jackson to apply for a temporary injunction. If this is secured steps will be taken to obtain a permanent injunction against the railroad commission. Pending the outcome of the litigation the carriers have agreed to pay the same taxes that they paid in 1916.

Rock Island Announces New Pass Rules

The Chicago, Rock Island & Pacific will on January 1 put in effect new regulations covering the issuance of complimentary annual passes to employees and their wives. Under the new rules some employees will be given complimentary annuals on appointment and others after one year in the service; or five years, 10 years, 15 years, 20 years, or 25 years. When a position requires traveling, an employee will be furnished such transportation as is necessary upon appointment. System passes will be issued to officers and officers' wives upon appointment. Pensioned employees and their wives will be furnished with the same class of annual pass as they had at the time pensioned. Wives of employees holding what are termed "traveling positions" under general or district officers will be given system

annual passes upon appointment. Among employees coming under this provision are service inspectors, district car inspectors, claim adjusters, demurrage inspectors, pilot engineers, special agents, traveling auditors, fuel inspectors, tie inspectors, bridge inspectors and traveling car agents.

Under the provisions of the schedule governing the issuance of complimentary passes to employees who do not come under the class of traveling positions, station agents at larger terminal stations, freight and passenger department agents, chief clerks to system, district and division officers, assistant chief clerks to general officers, telegraph managers and wire chiefs, are granted system annual passes for themselves and wives on appointment. Train service employees are granted division annual passes at the end of one year's service and their wives are granted division annuals at the end of five years' service. Both are permitted district passes at the end of ten years' service and system passes at the end of 15 years. Agents at the smaller stations, telegraphers, chief clerks to local division officers, yardmasters, switchmen, shop and roundhouse foremen, machinists, blacksmiths, boilermakers and their helpers, signal foremen and maintainers and like employees, will receive annual division passes at the end of five years, district passes at the end of 10 years and system passes at the end of 15 years. Laborers and janitors will receive annual passes for themselves and wives for the system at the end of 25 years' service.

Thirty Army Trucks on 600 Mile Run

The latest plan for helping to relieve the railway congestion was put into effect this week when a train of 30 Packard army trucks left Detroit for a port on the Atlantic seaboard, 600 miles distant. It is hoped that this fleet will be the first of a number totaling 30,000 trucks of various makes. The plan if carried out successfully will release 17,250 cars, says the Quartermaster-General, and it will also be the means of training hundreds of drivers for their duties later in France. Twenty-eight of the 30 cars are carrying freight. Two are loaded with gasoline, oil and repair materials. In some of the cars berths for drivers have been built so that if necessary the trucks can be run night and day with relief drivers.

The Quartermaster-General estimates that if the plan proves successful, the total relief given to the railroads, through the shipment to the coast under their own power of the 30,000 war trucks the Army has under construction, will amount to 690,000 tons. The trucks have an average capacity of three tons and only two of them can be shipped by rail in a 40-ton freight car. The new plan will, therefore, relieve fifteen thousand 40-ton freight cars, and will also permit the transportation of 90,000 tons of Government materials to the coast from the interior storage depots. The actual number of freight cars which the plan will relieve, therefore, if successful, will be 17,250 forty-ton cars.

The plan will serve also another urgent need, that of providing adequate opportunity for the training of an effective corps of transport drivers and officers.

The training which our men will receive in driving loaded Army trucks from factory to seaport under the trying conditions which will be encountered this winter will, as nearly as possible, reproduce the actual service conditions abroad. Under the plans worked out the transport companies will negotiate drives of varying distances up to 800 miles over various types of highways, and our men will have met and solved actual problems which will be invaluable to their efficient service behind the lines.

"Dementia Pullmaniana"

Springfield, Mass., has the distinction of being one of the most interesting junctions of the three principal railroads of New England; and like all important junctions is blessed with more or less noise. The following letter from The Springfield Republican of recent date, signed Frank A. Waugh, tells of one of the days when it was more. A New York-White River Junction car enjoys the hospitality of all of the three railroads at Springfield, so that, as regards the criticisms of this writer, all three, very likely, are entitled to share the honors. Beginning with an allusion to the general reputation of the city for hospitality, Mr. Waugh continues:

Yet possibly the entertainment committee might do something

further for the regular Pullman guests. The night train between the two great metropolises of New York and White River Junction is a special case in point. We leave New York at 11:15 and reach Springfield at 3:38 in the dull morning. There we are scheduled to wait until 6:55. For the first three-quarters of an hour our sleeper is used in breaking up and making up trains. We are shunted wildly up and down the yards. First the driver will yank us all up to one end of the berths; then he will butt us back to the other end.

He then sets us out on a siding to cool off. We need it. But we don't need so much of it. There being no heat attached to our car we get busy conserving coal. We soon save up enough to run the road for a month. While we are shivering on our shelves we are soothed with music—the music of passing freight trains and of impetuous switch engines, each one madly ringing its bell and running with the muffler cutout wide open.

Then the Springfield Republican appears on the scene. The young Caruso who shouts it under our windows also announces the "Murkan." He is assisted at his abode [an open-air morning serenade] by an enemy alien who, having escaped the draft, now smashes baggage on the platform beside us, meanwhile carrying on a "konversation" with a "kamerad" over by the American express office or down by the bridge.

The call of The Republican seems to be irresistible with the Springfieldians in our car. Their heads are exerted between the curtains and their sweetly modulated voices call up and down the aisle for the porter. The next hour is occupied with their matutinal toilets, while we listen to such gossip as: "Hello, George! Didn't know you were on this car!" "Yes; got on at N' York." "Fine morn—whose got my—Say, port', mileage book, upper seven!" etc.

Then, just before we freeze to death or are consumed with dementia pullmaniana, the train pulls out. The porter brushes the last Springfield passenger off the car and turns to rouse the Northampton ticket-holders. He finds us already pretty well aroused, yet sad in our politeness to think that we cannot pass before the Springfield entertainment committee with the high handshake ceremony and tell them how greatly we have enjoyed our call in their city.

Hospitality for the Soldiers

The Soldiers' Welfare Committee organized by the St. Louis sub-committee of the Commission on Car Service in connection with the railroad department of the St. Louis Y. M. C. A. has been doing an important work in extending hospitality to the soldiers passing through St. Louis. Last month the committee, of which Rubens Humphrey, executive secretary of the Y. M. C. A., is chairman, met troop trains or groups of soldiers almost daily. Forty troop trains or groups of soldiers, comprising 6,522 men, received the hospitality of the committee during November. On one day the committee met six different groups or trains of men. Soldiers passing through from points in the east, west and southwest were given the opportunity of stopping over at the Railroad Y. M. C. A. building and the privilege of bathing and writing letters. Postal cards, note paper, envelopes and stamps were provided free. The ladies on the committee had furnished supplies of apples, figs, raisins and candy, besides arranging for a social time while the soldiers were in the city.

The committee comprised 70 men and women divided into 14 sub-committees, each of which had charge of the arrangements for one day at a time. The chairman of the committee received direct information from the railroad companies as to the movement of troop trains and directed the movements of the sub-committees without advising them as to the destination of the trains. Many of the committee members, in addition to contributing their time, gave money and turned over their automobiles for the use of the committee.

In one instance the attention of the committee was called to the fact that a barber doing business near the Union Station had charged a soldier \$3 for a shave. The co-operation of the chief of detectives of the city police was immediately secured and the man was arrested. At another time the committee was informed that Canadian soldiers passing through were being charged approximately 20 per cent discount for changing Canadian money to American money. The committee secured from the Railroad Y. M. C. A. over \$500 in American money which was exchanged for the Canadian money on an even basis. A large number of the Canadian soldiers passing through told the committee that

St. Louis was the only place en route from Toronto where any one had met them at stations or provided them with little comforts and writing materials.

The June Conventions

The executive committees of the Master Car Builders and the American Railway Master Mechanics' Associations held a meeting at the Hotel Biltmore, New York, Thursday, for the purpose of deciding whether or not a convention be held in June, 1918. The result of the deliberations will be published in next week's issue.

Portland Cement Association

B. F. Affleck, Chicago, was re-elected president of the Portland Cement Association at its annual meeting at Hotel Biltmore, New York, on December 12. Mr. Affleck is president of the Universal Portland Cement Company. F. W. Kelley, President of the Helderberg Cement Company, Albany, N. Y., was elected first vice-president, and Richard Hardy, president of the Dixie Portland Cement Company, Chattanooga, Tenn., second vice-president. G. S. Brown, president of the Alpha Portland Cement Company, Easton, Pa., was elected treasurer.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meetings of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next annual meeting, March 20-22, 1918, Chicago.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January 22-24, 1918, Hotel Sherman, Chicago.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Morrison Hotel, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CINCINNATI RAILWAY CLUB.—H. J. Cade, Jr., Chief Interchange Inspector, C. & N. Y., 101 Carey Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 568 Union Arcade Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, 149 Peoples Gas Bldg., Chicago. Annual exhibition, March 18-21, 1918, Coliseum and Annex, Chicago.

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

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

Niagara Frontier Car Men's Association.—Geo. A. J. Hochgrebe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Hotel, Buffalo, N. Y.

PACIFIC RAILWAY CLUB.—W. S. Wollner, Assistant to Chief Engineer, Northwestern Pacific R. R., San Francisco, Cal.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial Annex Hotel, Pittsburgh.

St. Louis Railway Club.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis Hotel, St. Louis.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.

TRAFFIC CLUB OF CHICAGO.—C. B. Singer, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk P. Ace, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

WESTERN SOCIETY OF ENGINEERS.—Edgar S. Nethercut, Secretary, 1735 Monadnock Block, Chicago, Ill. Regular meeting, first Monday in month, except January, July and August. Extra meetings generally on other Monday evening except in July and August.

Traffic News

In the United States Court at Newark, N. J., December 18, fines amounting to \$6,000 were imposed on the Delaware, Lackawanna & Western for violation of the law forbidding carriers to keep animals in cars more than 28 hours. The Central of New Jersey was fined \$100 on a similar charge.

The freight traffic passing through the Sault Ste. Marie canals in the month of November amounted to 11,154,508 short tons, of which 8,753,843 tons were eastbound and 2,400,665 westbound. Of the westbound movement 1,885,586 tons were soft coal and 332,210 tons hard coal. Nearly 38,000,000 bu. of wheat and over 7,000,000 bu. of other grain passed through the canals to eastern destinations.

The Commission on Car Service has cancelled its general orders C S 3 and C S 3A, issued in June, directing the railroads to return hopper and self-clearing cars immediately to the home road when released from original road. Any existing restrictions prohibiting the use or interchange of interchangeable open cars are ordered cancelled so that unrestricted interchange of such cars may be permitted.

The Post Office Department announces that it has established coastwise parcel post water routes to relieve the railroad congestion. Steamer routes for parcel post have been established from Boston to Norfolk, Boston to Savannah, New York to Norfolk, New York to Charleston, New York to Jacksonville, New York to Savannah, New York to New Orleans, New York to Galveston, Philadelphia to Savannah, Philadelphia to Jacksonville, Baltimore to Savannah, and Baltimore to Jacksonville. Special delivery, insured and perishable parcels, and those too large for inclusion in sacks will not be carried on these routes. At present about four carloads of parcels are handled daily. The Post Office department has effected some saving of cars by routing through cars for long distances where it has been the practice to transfer.

In a recent telegram to John L. Nagle, manager of the California Fruit Exchange at Los Angeles, Cal., Edward Chambers, chairman of the transportation committee of the United States Food Administration, announced that beginning December 1, shippers of oranges and lemons would be required to load refrigerator cars seven boxes wide and two high the entire inside length of the car, either under ventilation or refrigeration. He also asked shippers of vegetables and deciduous fruits to advise him of the limit of safety to which they could increase the carload above the minimum, so that proper regulations might be issued at once. He stated that a careful survey of transportation conditions led him to believe that with the maximum co-operation of all shippers the railroads would be able to handle perishable freight this winter without serious delay.

Louisville, Ky., reported on Monday 17 inches of snow and temperatures down to seven below zero. Transportation was temporarily paralyzed throughout a larger part of Kentucky. The Ohio River was frozen over at many places, and all river transportation was stopped. Congestion of railroads at the Louisville and Cincinnati gateways increased. The National Fuel Administration on December 15 instructed W. B. Bryan, Kentucky Fuel Administrator, to seize approximately 3,000 cars of coal between the eastern Kentucky fields and Cincinnati and distribute the coal through Kentucky, where the public was in bad shape due to the diminution of the West Virginia natural gas supply. This coal was waiting entry into the north and east through Cincinnati, but the carriers north of the river had been unable to accept the cars, some of which had been held for two weeks.

Foresight

The Forest Service, United States Department of Agriculture, reports that by the use of a three-deck barge capable of carrying 2,700 sheep at a time, a hitherto unused grazing range for approximately 75,000 sheep, at the head of Lake Chelan, in the Chelan National Forest, Washington, has been made available for

use. Lake Chelan is a beautiful body of water, 52 miles long. The head of the lake is practically inaccessible by land, but the lower end is convenient to a railroad and also to the bunchgrass ranges of eastern Washington upon which the sheep men of that region have for many years wintered large numbers of sheep. They lacked summer range, however; while the summer range at the head of the lake is particularly good.

Officers of the Forest Service suggested the construction of a barge to be towed by a small steamer. This was done, and 37,000 sheep were carried to the head of the lake the first season. Thus the National Forest land is utilized, and the boat makes accessible a large adjoining area in British Columbia inaccessible from the Canadian side. The stockmen intend to build another and larger barge for use next season.

Rules for Putting Two "Car-Loads" in One Car

J. W. Roberts, superintendent of freight transportation of the Pennsylvania Lines West of Pittsburgh, in a circular to agents, recommending the loading of two "car-load lots" in a single car, where practicable, gives detailed instructions for the loading and billing of such shipments.

Shipments may be consigned to one or not more than two destinations, provided the first destination is intermediate to the second by available routes. Two shipments will not be accepted if the first destination is a prepay station. Shipment for the first destination must be for delivery on public team track or private siding of the railroad that performs the road-haul service to or from the first destination (not on the tracks of a switching line). The shipment for the second destination will be delivered under regulations published by the delivering line, the same as though the car had contained no other shipment. The carload rate at the actual weight, subject to minimums prescribed in the Official Classification or tariffs lawfully on file, will apply on each consignment. The two shipments should be so loaded as to permit unloading without re-handling. Separate bills of lading will be issued, and a separate revenue way-bill made for each consignment, the same as though each shipment were loaded in a separate car.

Waste of Using Flimsy Boxes

At the hearing held by the Interstate Commerce Commission in Boston on December 12 W. H. Doble, of the Pneumatic Scale Corporation, presented a statement concerning economical packing and loading, in which he said:

In considering increase of railroad rates necessary to properly meet advanced costs in labor and material, any possible savings to be secured by more efficient methods should be taken into account. The package freight car is responsible for the greater part of the wasteful short loading. Containers in which merchandise is offered for shipment are so weak and fragile that they cannot be stacked more than two tiers deep without crushing, owing to the indiscriminate nature of the freight. Grindstones and silk hats don't mix well. Until a substantial container is universally adopted, this short loading of cars is bound to prevail. Representatives of two roads have stated confidentially that the clerical expense involved in handling loss and damage claims is increasing and at present costing these two roads \$500,000 each per year. Of the \$500,000 annual loss and damage payments \$15,000,000 is lost through "rough or careless handling"; \$7,500,000 results from the loss of package freight through its going astray because of effaced or improper marking; \$1,000,000 yearly is attributed to concealed loss; \$3,000,000 is attributed to wrecks; \$5,000,000 is attributed to leaky car roofs, oil-soaked cars, etc., and the remaining 37 per cent consists of miscellaneous losses and those upon shipments other than in package form.

The speaker then went on to describe the collapsible metal carrier, with which our readers are well acquainted. He quoted from the American Railway Association's committee report to the effect that this carrier is many times stronger than a wooden box and practically indestructible in the ordinary wear and tear of freight handling. An automatic lock prevents it from being opened without clear evidence of robbery. It therefore prevents concealed losses, prevents damage, does not absorb moisture, and can be used over and over again indefinitely.

Continuing, he said: Investigation of the past four years proves that full efficiency of labor and space in the handling of

package goods can only be attained by the adoption of containers of such strength that no ordinary shock of traffic will change their inside contour. The one-trip, fragile container now in use represents an annual waste of \$120,000,000. The Government during the past 12 months has paid millions for one-trip containers, which might have been saved. This same \$120,000,000 by its drain on the pulp industry, has increased the price of paper to an unwarranted degree. Roads are urging the shipper to use stronger containers and the logical solution of this problem is in the use of a many-trip container. The economy is based on the strength of container, the shipper to secure maximum number of trips, the railroads to secure immunity from loss and damage, as well as increased loading efficiency. Over 800 prominent shippers throughout the United States have signed petitions asking that the roads make it possible to use a many-trip container on a mutually reasonable basis of cost.

A Plain Tale from the Hills

[From the Boston Transcript]

Bangor & Aroostook Railroad affairs were ventilated at the rate hearing (December 14) before the Interstate Commerce Commission examiner, Wilbur La Roe. Percy R. Todd, president of the road, testified that for a period of years it has shown a decreasing operating ratio. Examiner La Roe commented upon the comparatively good showing of the road; that it can put money out of its earnings into the maintenance of the property to such an extent that it need not carry any depreciation fund and at the same time can pay a dividend of 4 per cent; and he could not understand why the company should appear now and ask for an increase in rates.

To this President Todd replied that the increase asked for will amount to only \$20,000 a year to the company, a sum which the road needs to cover losses that are almost certain to come in the future. There is almost certain to be a drop in revenue. There are not so many potatoes to move. For about eleven years Mr. Todd has been trying to find out how many potatoes are raised and what the farmers are doing with them, and Mr. Hoover has been trying for some months to obtain the same information, but they have not been able to find out. The farmers will not tell. It is evident, however, that the potato crop this year was between 30 and 40 per cent short. There is storage capacity for about 7,000,000 barrels along the railroad and there are not more than 1,000,000 barrels stored today. The farmers have built their own storehouses this year, however, and how much they have in them it is impossible to find out. But the railroad has handled 5,000 cars less, so far, than it handled last year up to the same time.

And the lumber movement will be smaller than usual. The lumber men have difficulties in getting labor, and declare that they will not be able to cut more than 25 per cent of the normal crop. Mr. Todd said that it was 22 degrees below zero on his line last night, which is not an unusual temperature; and the freight capacity shrinks by 40 per cent. Snow plows with two engines have to run almost constantly from December 15 to March 15, and passenger trains have to use two locomotives on the grades. Track laying is suspended from November until June, and when the frost comes out of the ground it is likely to come out from under one rail before it gets out from under the other, making operation dangerous.

The company needs more cars. It started to buy new cars, but the Government requests the roads not to buy new cars now. Then it bought 200 old freight cars out West, to be strengthened before they were delivered. After the work of repair had been started at one factory the Government notified the railroad that the factory was needed for war work, and the cars had to be sent to another place. Unable to get enough cars that way, the railroad started to build 150 at its own yards and bought all the material and carried it to its own plants to be assembled. Although it secured more men than it had before, it could not get more than 75 per cent efficiency out of the labor, and had to abandon the idea of assembling the cars with its own men. Then the material was collected and shipped away again to Laconia, N. H., to be assembled there by a car-building company.

OCTOBER A RECORD MONTH IN CANADA.—The Canadian railways handled the greatest volume of traffic in their history during the month of October. The total gross earnings amounted to \$34,379,125.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The Interstate Commerce Commission has announced an informal hearing before its Fifteenth Section Board at Washington on December 19 on the application of the Southeastern Passenger Association for approval of a proposed increase in charges for interchangeable mileage books in the Southeast.

STATE COMMISSIONS

Proposed Reduction of Freight Rates in Georgia

The State Railroad Commission of Georgia, in a tentative report on its consideration of the request, presented many months ago by all of the railroads of the state for authority to make an increase in freight rates, has issued a circular outlining the principles on which it proposes to authorize certain changes; and a hearing has been appointed for January 22, when criticisms or suggestions will be received. The order proposes some reductions in rates, but there will be no final approval of reductions until after the proposed tariffs have been tried for a time and the records have been compared with records of movement under the old rates. The commission's order is summarized as follows:

First. The commission declined to adopt the Southern classification with Georgia exceptions, in lieu of the present Georgia classification, but retained the present Georgia classification with certain amendments and eliminations which will produce a more nearly complete uniformity in classification ratings and descriptions. Southern classification was declined largely on the ground that it would produce an unwarranted increase in freight rates.

Second. The commission revised its freight classification of railroads in Georgia, eliminating the present four grand classes and reclassifying the carriers of Georgia in two grand divisions, class A and class B, the former including all so-called trunk line railways and their subsidiary branches, while the latter class takes in the small roads.

Third. The commission proposes to eliminate its present joint freight rate rule, and to prescribe the mileage scale for the combined mileage of joint hauls, plus a scale of arbitrariness, ranging from 8 cents, first class, down to 2 cents per 100 lb., class C.

Fourth. The commission proposes to eliminate the present "basing point" system of rate construction in Georgia and apply the long-and-short-haul principle, a change of great importance to Atlanta, Macon, Augusta, Savannah and others of the larger centers which now operate as basing points. The effect of this change is to increase rates between present basing points where such present rates are lower than to intermediate points.

Fifth. The commission has prescribed a maximum of 95 cents per 100 lb. (470 miles) on intrastate first-class traffic, and a minimum of 16 cents (5 miles), and prescribes a percentage relationship of all classes to first class.

PERSONNEL OF COMMISSIONS

B. H. Meyer has been nominated by President Wilson for reappointment as a member of the Interstate Commerce Commission for seven years; and the Senate has confirmed the nomination.

COURT NEWS

Trackage Agreement Construed

Under a trackage agreement between two railroad companies, the object of which as expressed in the agreement was to enable one of the companies to connect disconnected portions of its railroad to form a continuous line, and to operate trains to and from points on its own road, the other company granted the right to use in connection with it a part of the railroad owned and operated by it, "including the main tracks, sidings, passenger and freight stations, Y's, inclines and other appurtenances and terminal and station facilities connected therewith." The Ohio

Supreme Court holds that the grantee company has no right to the use of a track built by the owning company on the right of way and connecting its main track with the mine tracks of a coal company, which track was not built for the general use of the railroad companies, but for the convenience of the coal company. The question was raised in a complaint to the Public Utilities Commission against the grantee railroad requiring it to furnish complainant cars for hauling its product. The commission's order in favor of the coal company was reversed. The court holds that the rights acquired by the grantee were contract rights, subject to the limitations and restrictions contained in the agreement, and the duties of that company to the public were not the general duties of a common carrier operating on its own road. That company could not be required to furnish cars to a coal company whose mine was situated on the part of the railroad over which the railroad was operating under the traffic agreement, if in the rendition of such service there would be a violation of a restriction contained in the agreement.—*Kanawha & M. v. Public Utilities Commission (Ohio) 117 N. E., 353. Decided May 29, 1917.*

UNITED STATES SUPREME COURT

Records of Shipments of Intoxicating Liquors

The Supreme Court of the United States has affirmed the judgment of the North Carolina Supreme Court (169 N. C., 295) adjudging the Seaboard Air Line guilty of violating section 5 of the North Carolina statute of 1913, requiring railroad companies to keep a separate book in which shall be entered the name of every person to whom intoxicating liquor is shipped, together with amount, kind, date of receipt, etc., to be followed by the consignee's signature, acknowledging delivery; providing that the book shall be open to inspection by any officer or citizen, and making failure so to do a misdemeanor. The company refused to permit a citizen to inspect its record of liquors transported from Virginia into Wake county, N. C. The railroad contended that the section was void as an attempt by the state to regulate interstate commerce, and also that, to comply, the carrier would violate the law which prohibits the disclosure of such information regarding shipments to third persons except under specified circumstances; and that the Webb-Kenyon Law of 1913 could not affect the application of these principles to shipments destined to points in Wake county, because it relates to liquors intended to be received, possessed, sold or used in violation of state law, and to receive or possess liquor in any quantity in that county is not unlawful. The Supreme Court said, by Justice McReynolds: "Since our decision in *Clark Distilling Co. v. Western Maryland Ry. Co.*, 242 U. S., 311, 320, 324, it has not been open to serious question that the Webb-Kenyon Law is a valid enactment; that its purpose was to prevent the immunity characteristic of interstate commerce from being used to permit the receipt of liquor through such commerce in states contrary to their laws, and thus in effect afford a means by subterfuge and indirection to set such laws at naught; and that under it a state may inhibit shipments therein of intoxicating liquors from another by a common carrier although intended for the consignee's personal use where such use is not actually forbidden. Plainly, therefore, after that enactment nothing in the laws or Constitution of the United States restricted North Carolina's power to make shipments of intoxicants into Wake county a penal offense irrespective of any personal right in a consignee there to have and consume liquor of that character. "The challenged act instead of interposing an absolute bar against all such shipments, as it was within the power of the state to do, in effect permitted them upon conditions intended to secure publicity, to the end that public policy might not be set at naught by subterfuge and indirection. The greater power includes the less.

"The provisions of section 15, Act to Regulate Commerce, here relied on, were intended to apply to matters within the exclusive control of the Federal Government; and when by a subsequent act Congress rendered interstate shipments of intoxicating liquors subject to state legislation, these provisions necessarily ceased to be paramount in respect of them." Justice Van Devanter dissented. Decided December 10, 1917. (The court has sustained the Idaho law which is truly "bone-dry." "Under it no person, without a permit, may possess liquor for medicinal, religious or industrial purposes)."

Equipment and Supplies

FREIGHT CARS

THE UTAH COPPER COMPANY is inquiring for 200 60-ton hopper ore cars.

THE ANACONDA COPPER MINING COMPANY is inquiring for 10 40-ton box cars.

THE REPUBLIC CREAMERY COMPANY, Indianapolis, Ind., is inquiring for five 10,000-gal. tank cars.

T. E. HAMMAN, Milmine, Ill., has ordered 5 box cars from the Central Locomotive & Car Works.

JOSEPH E. GRANVILLE, St. Louis, Mo., has ordered 4 box cars from the Central Locomotive & Car Works.

THE UNITED STATES GOVERNMENT has ordered 65 gun cars from the American Car & Foundry Company.

THE PETROLEUM PRODUCING & REFINING COMPANY, Tulsa, Okla., is inquiring for from 30 to 50 tank cars.

THE OREANA GRAIN COMPANY, Oreana, Ill., has ordered one box car from the Central Locomotive & Car Works.

THE FRENCH GOVERNMENT has ordered 1,000 steel underframe flat and 850 steel underframe gondola cars of 60 cm. (1 ft. 11½ in.) gage from the American Car & Foundry Company.

THE UNION PACIFIC's order for 50 caboose cars, reported in a recent issue of the *Railway Age Gazette* as given to the Mount Vernon Car Manufacturing Company has been transferred to the American Car & Foundry Company instead.

SIGNALING

THE NORFOLK & WESTERN has ordered from the Union Switch & Signal Company 15 signals, style S, for use on the Big Sandy division, near Kenova, W. Va.

THE JACKSONVILLE (FLA.) TERMINAL COMPANY has ordered from the Union Switch & Signal Company the material for two interlocking plants, towers 1 and 3, at the new Jacksonville passenger terminal. These machines will have mechanical levers for switching and electric power for signals.

THE PHILADELPHIA & READING has contracted with the Union Switch & Signal Company for the complete installation of an alternating current system of automatic block signals between the Delaware River Bridge and Skillman, N. J., 13 miles, three track and four track. The signals will be style T2 and the track relays Union Model No. 15, vane type. The work will also embrace the installation of a Type F electric interlocking at Trenton Junction, 11 levers. Changes will be made also at other interlockings and there will be two new twelve-lever mechanical machines, one at Hopewell and the other at Trenton Junction.

NEW YORK STATE HIGHWAY MILEAGE.—The designated mileage of state and county highway systems in New York State is 11,988, of which 5,926 miles had been completed and accepted on January 1, while contracts in force at that time covered 1,185 miles. This, with the contracts awarded during the year 1916, leaves a balance of designated mileage not yet cared for of 4,210. Highway construction during the past two years has been greatly hindered by shortage of labor.

INCREASED RATES IN NORWAY.—A substantial temporary increase in the rates on the Norwegian State Railways, both for passenger and freight traffic, has been decided upon owing to the very material increase in the cost of operating the railways. Including previous temporary increases in the railway rates, the rise amounts to 80 per cent for first and second-class passengers, 60 per cent for third-class passengers, 100 per cent on passengers' baggage, and 100 per cent on express and ordinary freight traffic, except articles of food and fuel, for which commodities the increase amounts to 70 per cent, and milk, for which it is 50 per cent.

Supply Trade News

The Greaves-Klusman Tool Company, Cincinnati, Ohio, has purchased the plant of the Champion Tool Works and will use it as an erecting plant in addition to its present works.

L. S. Love has resigned as sales manager of the Sherritt & Stoer Company, Philadelphia, to become general manager of the Machine Tool Engineering Company, Singer building, New York.

N. B. Payne has opened an office in the Havemeyer building, 25 Church street, New York, as an electric crane specialist dealing in new and used traveling cranes. Mr. Payne was formerly associated with Manning, Maxwell & Moore, Inc., New York, and has an extensive experience in this kind of work.

James K. Howard has been appointed general manager and elected a director of the A. G. A. Railway Light & Signal Company with headquarters at the company's main office, Elizabeth,



J. K. Howard

N. J. Mr. Howard was born on August 8, 1871, at Zanesville, Ohio. He entered railway service on the New Haven & Derby as a rodman, but left in 1890 to enter Rutgers College where he studied until 1893. He then entered the employ of the Peoria & Pekin Union, serving successively as assistant engineer and engineer until 1899. In July, 1900, he went with the Wabash as division engineer, leaving in July, 1905, when he entered the service of the Chicago, Peoria & St. Louis as engineer of maintenance of way. After serving

in this capacity until January, 1907, he left the road to become engineer in charge of railway surveys in eastern Ohio and western Pennsylvania. In July, 1910, he was appointed engineer of maintenance of way on the Ann Arbor, leaving in January, 1913, to become assistant chief engineer for the Lorain, Ashland & Southern, which position he held until October, 1916, when he became connected with the A. G. A. Company. He has held the position of northwestern representative of the company at Chicago since last February.

TRADE PUBLICATIONS

LONG LEAF STRUCTURAL TIMBER.—The Crowell & Spencer Lumber Company, Long Leaf, La., has issued a 24-page handbook for the use of engineers. In addition to a description of Calcasieu long leaf pine and an exposition of the trade-mark containing that word as applied to yellow pine lumber, the book contains specifications for yellow pine, tables of working stresses for beams and columns and a copy of the table of allowable stresses in structural timbers used in wooden bridges and trestles adopted by the American Railway Engineering Association in 1909.

CUTTING AND THREADING TOOLS FOR PIPE.—This is the title of catalog No. 12 of the Borden Company, Warren, Ohio, a neatly gotten up 32-page booklet covering the "Beaver" line of pipe tools. The line includes a number of types and sizes of die stocks and square-end pipe cutters. In the "Beaver" die stocks, the dies themselves are without taper, the taper thread being cut by automatically moving the dies away from the pipe as the threading operation progresses. Since the dies are straight but few teeth are required, and the range of adaptability is materially increased. The catalogue explains the principle on which these dies operate and contains a complete illustrated list of repair parts.

Financial and Construction

FINANCIAL NEWS

BALTIMORE & OHIO.—Following the meeting, on December 19, of the board of directors which was held a week earlier than usual, it was announced that action on the dividend was deferred until the next meeting, which it is expected will be held on January 16. Commenting on the situation, President Daniel Willard stated "that action was postponed because of the present unfavorable conditions, that the board naturally desired to make as large a distribution to the shareholders as was justifiable and it was hoped that there might be some favorable developments within the next few weeks which would support a more liberal action than would now be possible. Notwithstanding the company will have handled the greatest business in its history and will have realized the largest gross earnings, it was evident that the operations of the year would show earnings applicable to the common stock of less than 5 per cent. This possibility was foreseen and emphasized in my statement before the Interstate Commerce Commission on November 5. The gross earnings of the property will exceed those of the previous year by \$12,500,000, but the expenses will be over \$16,000,000 greater—transportation expenses alone being over \$14,000,000 in excess of the year 1916. The increased expenses are due in part to the severe weather conditions which prevailed in February, March and December of the current year, but are chiefly due to the increases in rates of pay, and in the price of fuel and material, which have, so far, been offset only in part by increase in rates."

NEW YORK, ONTARIO & WESTERN.—This company has declared a dividend of 2 per cent on the common stock, payable January 14 to stock of record December 31. The last previous dividend was 1 per cent, on July 24, 1916. In 1909, 1910 and 1911, dividends were paid at the rate of 2 per cent per annum. No dividend was paid in 1912, and in 1913 2 per cent was paid. The New York, New Haven & Hartford owns \$29,160,000 of the \$58,113,983 common stock of the New York, Ontario & Western, having acquired this majority interest in October, 1914, at a cost of \$45 per share. A dividend of \$2 a share on the common stock of the New York, Ontario & Western means \$583,200 additional revenue for the New Haven.

TEHUANTEPEC NATIONAL.—The Mexican Government is negotiating with S. Pearson & Son, Ltd., of London, for the dissolution of this railway, which extends from Puerto Mexico to Salina Cruz, Mex., 188 miles. The road had been operated under a contract extending for 50 years from July 1, 1903, between the Federal Government of Mexico and the firm of S. Pearson & Son. This contract provided that S. Pearson & Son should operate and manage the railway as managing partners for and on account of the partnership, with a working capital of \$5,000,000, one-half of which was to be furnished by each partner. The agreement now concluded contemplates that the government shall acquire the road and also the docks and harbor works now under construction at Puerto Mexico, the contract with the company being cancelled.

RAILWAY CONSTRUCTION

PENNSYLVANIA LINES WEST.—Plans have been made and bids will be asked for soon for improvements to be carried out at Cincinnati, Ohio, on the Cincinnati, Lebanon & Northern. The work will include new inbound and outbound freight stations, office building, team track yards, etc., to cost \$250,000.

PENNSYLVANIA RAILROAD.—Construction work is now under way on the Chester & Philadelphia branch of the Philadelphia, Baltimore & Washington. This branch leaves the South Chester branch near Central and Delaware avenues, Chester, Pa., and is located over private property to Front street. From the latter point it will be constructed through the city of Chester to Ridley Creek, thence via North Essington to a connection with the Pennsylvania Railroad at Girard Point. The general contract has been given to the James McGraw Company.

Railway Officers

Executive, Financial, Legal and Accounting

C. A. Trimble has been appointed assistant general auditor of the Colorado & Southern, with office at Denver, Colo.

H. G. Jenkins has been appointed assistant to the president of the Northwestern Pacific, with office at San Francisco, Cal.

T. A. Hamilton, special representative in the president's office of the St. Louis-San Francisco at St. Louis, Mo., has been appointed controller.

H. A. Toland has been appointed assistant auditor of the Oregon Short Line with headquarters at Salt Lake City, Utah, succeeding T. A. Martin, resigned, effective December 1.

G. W. Thompson has been appointed assistant to the president and purchasing agent of the Detroit, Toledo & Ironton, with headquarters at Detroit, Mich., succeeding A. H. Jones, transferred.

The officers of the Delphos branch of the Cincinnati, Hamilton & Dayton, the sale of which to John Ringling was noted in these columns on November 2, are as follows: John Ringling, president, with office at New York City; C. C. Wilson, vice-president, with office at Chicago; W. J. Bohan, general manager, O. C. VanZandt, secretary and J. M. Kelley, general attorney, with offices at Dayton, Ohio.

Operating

John Fritz has been appointed terminal superintendent of the Southern Railway, with headquarters at East St. Louis, Ill.

P. J. Coleman, trainmaster of the Northern Pacific at Jamestown, N. D., has been appointed assistant superintendent of transportation with headquarters at St. Paul, Minn.

A. Pardoe, car accountant of the Colorado & Southern, has been appointed acting superintendent of transportation, with headquarters at Denver, Colo., succeeding G. C. Randall.

E. D. Moore has been appointed superintendent of the Lansing division of the New York Central, with headquarters at Hillsdale, Mich., succeeding M. L. Reynolds, effective November 15.

F. J. Easley, until recently general manager of the Denver & Rio Grande, has been appointed general manager of the Peoria Railway Terminal Company, with headquarters at Peoria, Ill., succeeding George Walliser, resigned.

A. H. Jones, assistant to the president and purchasing agent of the Detroit, Toledo & Ironton, has been appointed general superintendent in charge of transportation and car service matters, succeeding G. W. Thompson, transferred.

E. H. Harman has been appointed superintendent of the Wiggins Ferry Company, with headquarters at St. Louis, Mo., succeeding Charles Burlingame, who has been appointed superintendent of the Terminal Railroad Association, with headquarters at the same city.

A. A. Freiberger has been appointed assistant superintendent of the Memphis subdivision and the Memphis (Tenn.) terminals of the St. Louis-San Francisco, succeeding E. L. Magers, who has been appointed superintendent of the Western division, succeeding E. C. Lilley resigned.

W. J. McGarry, superintendent of car service of the Lehigh Valley, with headquarters at South Bethlehem, Pa., has been appointed superintendent of transportation, a newly created position, and his former position has been abolished. V. D. Thayer, chief clerk in the car record office at South Bethlehem, has been appointed car accountant.

C. C. Holtorf, assistant superintendent of the Chicago, Burlington & Quincy, with headquarters at Deadwood, S. D., has been transferred to the Casper division, with headquarters at Greybull, Wyo. W. G. Dungan, trainmaster and roadmaster at Orleans, Neb., has been promoted to assistant superintendent of the Alliance division to succeed Mr. Holtorf. These changes were effective December 5.

A. S. Johnson, superintendent of the Terminal Railroad Association of St. Louis, has been promoted to assistant general manager, a newly created position, with headquarters at St. Louis, Mo. Charles Burlingame, superintendent of the Wiggins Ferry Company, St. Louis, has been appointed superintendent of the Terminal Railroad Association, with the same headquarters, succeeding Mr. Johnson.

J. L. Kendall has been appointed superintendent of the Valley division of the Missouri Pacific with headquarters at McGehee, Ark., succeeding D. O. Ouellet, transferred to Osawatimie, Kan., as superintendent of the Central Kansas and Colorado division. W. F. Kirk, assistant superintendent at Atchison, Kan., has been appointed acting superintendent of the Wichita division, with headquarters at Wichita, Kan. The above changes were effective December 15.

W. T. Wolff, whose appointment as superintendent of freight station service of the Pennsylvania Lines West of Pittsburgh, with headquarters at Pittsburgh, Pa., was announced in the



W. T. Wolff

Railway Age Gazette of December 14, first entered railway service with the Pennsylvania Lines on December 1, 1879, as a clerk in the superintendent's office at Cincinnati, Ohio. On May 1, 1880, he was transferred to the trainmaster's office at Xenia, Ohio, and on October 1, 1881, returned to the superintendent's office at Cincinnati. From April, 1886, to February 1, 1900, he was chief clerk in the superintendent's office at Cincinnati, and from the latter date to August 1, 1902, he was assistant trainmaster of the eastern division of

the Pennsylvania Lines. After six months as chief clerk to the general manager of the Chicago, Rock Island & Pacific at Chicago, he returned to the Pennsylvania Lines on February 1, 1903, as assistant trainmaster on the Indianapolis-Vincennes division. On April 1, 1903, he was transferred to the office of the general superintendent of freight transportation at Pittsburgh as special agent. On April 1, 1905, he assumed charge of the car record office for the Pennsylvania Lines West at Pittsburgh. He resumed miscellaneous work as special agent in the office of the general superintendent of freight transportation on April 1, 1912, and on December 15, 1917, was appointed superintendent of freight station service, with headquarters at Pittsburgh.

Mott Sawyer, superintendent of the Chicago, Milwaukee & St. Paul at Mason City, Iowa, has been appointed superintendent of the Columbia and Idaho division, with headquarters at Spokane, Wash., vice Ezra Clemmons, assigned to other duties. F. G. Hill has been appointed superintendent of the Musselshell division, with office at Miles City, Mont., succeeding Hugh Spencer, assigned to other duties. A. E. Campbell succeeds Mr. Hill as superintendent of the Trans-Missouri division, with office at Mobridge, S. D., and H. L. Wiltrout succeeds Mr. Campbell as trainmaster, with office at St. Maries, Idaho.

C. S. Christoffer, assistant superintendent of the Milwaukee terminal of the Chicago, Milwaukee & St. Paul, has been promoted to superintendent of the Chicago terminal, succeeding P. L. Rupp, transferred. C. A. Bush has been appointed assistant superintendent of the Milwaukee terminals, succeeding Mr. Christoffer. P. L. Rupp, superintendent of the Chicago terminal division, has been appointed superintendent of the Chicago & Milwaukee division, succeeding E. G. Atkins, who has been transferred to Mason City, Iowa, as superintendent of the Iowa & Dakota division, in place of M. Sawyer, transferred. The above changes took effect December 15.

R. E. Woodruff, whose appointment as superintendent of transportation of the Erie, with headquarters at Youngstown, Ohio, was announced in these columns on November 9, was born

at Green Bay, Wis. He graduated from Purdue university in 1905 and in the same year began his railroad career with the Erie as a track laborer. He later served as foreman, transitman, assistant division engineer, division engineer and trainmaster at various points on the Lines West. From March, 1909, to November, 1910, he was general agent at the Chicago terminal; from November, 1910, to May, 1912, he was division superintendent at Rochester, N. Y.; from May, 1912, to November 1, 1916, he was superintendent at Marion, Ohio. On November 1, 1916, he was promoted to superintendent of the Mahoning division with headquarters at Youngstown, Ohio, which position he held at the time of his appointment, as noted above.

C. T. Ames, whose appointment as terminal superintendent at Chicago of the Chicago, Rock Island & Pacific was announced in these columns on November 30, was born at Boston, Mass. He entered the service of the Fitchburg in the general freight department in October, 1892. He served in various clerical capacities, including secretary to the general freight agent, until February 1, 1898, when he was appointed traveling freight agent, with headquarters at Troy, N. Y., where he remained until February, 1899, when he returned to Boston as eastbound freight agent. He left this position on the consolidation of the Fitchburg and the Boston & Maine in the fall of 1900 to become traffic manager of the Hudson Valley, with headquarters at Troy, N. Y. He entered the service of the Chicago, Rock Island & Pacific in January, 1903, in the office of the superintendent of the Illinois division at Chicago and after seven months was promoted to chief clerk, remaining in that capacity until 1907, when he was transferred to the general manager's office as service inspector. In October, 1908, he was assigned to special duties at Little Rock, Ark., by the general superintendent. He returned to Chicago in the summer of 1909 and entered the general manager's office, where he remained until February 1, 1911, when he was appointed chief clerk to the second vice-president, which position he held up to December 1, when he was appointed terminal superintendent, as noted above.

Traffic

S. A. Eddy has been appointed commercial agent of the Chicago, Milwaukee & St. Paul at Winnipeg, Man.

Walter C. Harden, whose appointment as assistant general passenger agent of the Delaware & Hudson, with headquarters



W. C. Harden

at Albany, N. Y., has already been announced in these columns, was born on May 20, 1890, at Troy, N. Y. He was educated in the public schools of Troy, and in 1909 graduated from Lansingburg high school. In June, 1910, he began railroad work in the passenger department of the Delaware & Hudson, and to the following November served as office boy. From November, 1910, to January, 1914, he was rate clerk. On January 1, 1914, he was appointed chief rate clerk, which position he held until his appointment on December 1, 1917, as

assistant general passenger agent of the same road, as above noted.

E. L. Hickman has been appointed general agent of the Michigan Central at South Bend, Ind., effective December 1.

G. V. Omohundro has been appointed commercial agent of the Colorado & Southern at Cheyenne, Wyo., succeeding A. L. Moore.

L. P. Hichman has been appointed commercial agent of the Cleveland, Cincinnati & St. Louis at East St. Louis, Ill., succeeding E. J. Zschirpe.

C. H. Morrill, director of development of the St. Louis-San Francisco, with office at St. Louis, Mo., has been appointed assistant freight traffic manager.

G. W. Vetter was appointed general agent of the Atchison, Topeka & Santa Fe at Tulsa, Okla., succeeding P. T. McKirahan, resigned, effective December 1.

G. F. Scheer, traveling passenger agent of the Baltimore & Ohio, with headquarters at St. Louis, Mo., has been promoted to general agent, with headquarters at Toledo, Ohio.

F. E. Hammann, assistant general passenger agent of the Lehigh Valley, with office at New York, has been promoted to manager of mail traffic and general baggage agent, with headquarters at New York, and on January 1, the general baggage and railway mail departments will be combined. Mr. Hammann began railway work with the Lehigh Valley as a clerk in the passenger department at Mauch Chunk, Pa. He subsequently served as chief rate clerk at South Bethlehem and then as chief clerk to the general passenger agent at Philadelphia, Pa. On April 17, 1905, he was appointed assistant general passenger agent with office at New York, and now becomes manager of mail traffic and general baggage agent of the same road as above noted. Mr. Hammann's entire railway service has been with the Lehigh Valley.

F. E. Lewis, commercial agent of the New York Central at Detroit, Mich., has been appointed division freight agent, with the same headquarters, effective November 15. The office of commercial agent has been abolished.

Norman W. Pringle, division passenger agent of the Lehigh Valley with office at Ithaca, N. Y., has been appointed assistant general passenger agent, with headquarters at New York. He was born at Huntingdon, Que. and began railway work with the Rutland Railroad in the freight house at Rutland, Vt. Six months later he entered the passenger department and served as traveling passenger agent with office at Rutland, on the same road. In 1909 he went to the Lehigh Valley, and served as New England agent at New Haven, Conn., until 1914, when he was appointed division passenger agent, with office at Buffalo, N. Y. In 1916 he was transferred in the same capacity to Ithaca, from which position he is now promoted to assistant general passenger agent of the same road as above noted.

W. M. Orr, of the Queen & Crescent Despatch fast freight line, with headquarters at Cincinnati, has been appointed division freight agent of the Southern at New Orleans, La., succeeding R. H. Tate, whose death was mentioned in the issue of November 9.

The titles of M. R. Leahy and R. Thomson, assistant general passenger and ticket agents of the Chicago & North Western, with headquarters at Chicago, Ill., have been changed to assistant general passenger agents, with the same offices. The title of G.

Bronnell has been changed from industrial and immigration agent to industrial agent, with office as before at Chicago.

A. P. Bean, general baggage agent of the Lehigh Valley with office at South Bethlehem, Pa. and W. T. Heeran, supervisor of mail traffic, with office at New York, have resigned to enter other business. H. J. Bills, district passenger agent with office at Minneapolis, Minn. has been appointed division passenger agent with headquarters at Ithaca, N. Y. succeeding N. W. Pringle promoted.

D. H. Hoops, whose appointment as assistant general freight agent of the Chicago & North Western, with headquarters at Chicago, was announced in these columns on November 30, was born at Chicago in 1869. He entered the service of the Chicago & North Western in 1887 as an office boy and has been with that company continuously since that date, serving as chief rate clerk in the general freight department; chief clerk to the general freight agent, Des Moines, Iowa; assistant general agent, freight department, Chicago; general agent, passenger department, Chicago; general agent, freight and passenger department, Denver, Colo.; and general agent, freight department, Chicago. He held the last named position at the time of his promotion as noted above, effective November 15.

Engineering and Rolling Stock

C. F. Ludington, superintendent of the fuel department of the Missouri, Kansas & Texas, has been appointed fuel supervisor of the Chicago, Milwaukee & St. Paul with office in Chicago, effective December 15.

G. F. Wieseckel, master mechanic of the Western Maryland, with office at Hagerstown, Md., has been appointed superintendent of motive power, with headquarters at Hagerstown, succeeding H. R. Warnock, resigned to go to another company.

L. Clapper, assistant engineer on the Duluth & Iron Range, has been appointed engineer of bridges and buildings. His duties will include those previously performed by B. T. McIver, general foreman of bridges and buildings, resigned, and such other duties as may be assigned him.

R. H. Nicholas, general foreman of the Central of New Jersey at Communipaw (N. J.) engine terminal, has been appointed assistant master mechanic, and W. E. Hardy, foreman at East Twenty-second street, has been promoted to general foreman at Communipaw engine terminal, vice Mr. Nicholas.

L. E. Dix, master mechanic of the Trans-Mississippi terminal, a subsidiary of the Texas & Pacific, has had his jurisdiction extended over the Louisiana division of the Texas & Pacific, from New Orleans, La., to Boyce, with headquarters at Gouldboro, La. J. A. Delaney, whose transfer to Big Springs, Tex., was mentioned in these columns on December 7, was master mechanic of this division.

Special

E. Moore has been appointed insurance commissioner of the Canadian Pacific.

Railway Officers in Military Service

Major N. D. Ballantine, assistant to the vice-president of the Chicago, Rock Island & Pacific at Chicago, has assumed charge of the recruiting of the 416th Battalion of the United States Signal Corps at Grand Rapids, Mich., during the illness of the major of that battalion.

OBITUARY

G. M. Anderton, first lieutenant in the Engineer Corps of the Army, and formerly an assistant engineer on the Illinois Central, died on December 9, on board a United States transport bound for Europe.

GO ROUND GLOBE TO GET HOME.—Traveling from Asia and Africa by way of the United States, in order to reach England and the Continent has become necessary for many since discontinuance of direct steamship traffic. A British steamship which arrived recently at New York brought several mining engineers and others on their way to their homes in England from Cape Town, South Africa, to spend the Christmas holidays.



F. E. Hammann



N. W. Pringle

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GENERAL NEWS SECTION

PRESIDENT WILSON TAKES OVER THE RAILWAYS

ON Wednesday night, after this edition of the *Railway Age Gazette* was ready for the press, President Wilson issued a proclamation taking over control of the railways and appointing Secretary of the Treasury McAdoo the director general of railroads. The plans suggested by the President for compensating the railways are not as good as railway managers hoped for, but they are as good as could reasonably be expected, and the duty of all railway men is to now turn in and help Mr. McAdoo make a complete success of his big task. The President's proclamation will be found on page 1170.

Both the gross and net earnings of the railroads in 1916 were so large that when measured in billions and millions they seemed to give evidence of astounding prosperity and it is only when expressed in terms of the percentage earned on the investment that their true character is seen. So many glowing accounts have

The Rate of Return on Railway Investment

been published of the results of railway operation in 1916 that, even at the risk of adding to the confusion of figures, we cannot refrain from calling attention to the fact that the Interstate Commerce Commission in a table published in its annual report to Congress last week, states the percentage of operating income to property investment for the fiscal year 1916 as only 5.8 for roads of Class I and Class II and their non-operating subsidiaries. In its annual report for 1916 it published an estimated figure of 6.35 per cent. In the *Railway Age Gazette* of September 29, 1916, there was published an estimate that the rate of return for that year would hardly exceed 5.6 per cent and on January 12, 1917, we published another estimate of 5.9 per cent for the calendar year 1916. The commission's report now gives a new estimate of 6.5 per cent for the 12 months ending June 30, 1917. With the idea that possibly the commission's method of estimating may have again produced a result as much more favorable

than the revised figures will show as it did in 1916, we have had another analysis of the available statistics for 1917 made by the Bureau of Railway Economics and get a result of approximately 5.7 per cent. In the course of time, when the Interstate Commerce Commission's official statistical reports finally emerge from the congestion of the government printing office, we shall accept the result there stated, but while estimates are being made we feel at liberty to call attention to the fact that the commission's method of estimating from the Class I roads alone produces a higher average rate of return than is obtained by using the operating income of the million dollar roads and making an estimate for the roads of Class I and Class III. This produces an operating income for the 12 months ending June 30, 1917, of \$1,090,000,000. After deducting an estimate for the taxes of lessor companies, and hire of equipment, joint facilities and miscellaneous rents, on the basis of the 1916 figures, we get a net operating income of \$1,050,000,000 or \$4,237 per mile, which on the basis of \$74,000 per mile investment produces an average return of 5.72 per cent. The Interstate Commerce Commission in its estimate apparently does not make the deductions referred to but uses a figure of \$1,069,750,000 for operating income, instead of calculating the net operating income. As the commission has reduced its estimate for 1916 from over 6 per cent to 5.8 per cent it is not impossible that, when its official statistics are issued, the result for 1917 will be found to be less favorable than has been generally assumed.

In carrying out the recommendations of the Special Committee of the Association of American Railway Accounting Officers,

Co-operation With Accounting Department

which are printed elsewhere in this issue, accounting officers will need the co-operation of the executives and of the heads of other departments especially in regard to the installation of mechanical devices and the elimination of unnecessary statistics. Appropriations for anything in the nature of a capital expenditure are particularly hard to get now, but it would be penny wisdom of the worst kind to fail to substitute, wherever expedient, mechanical devices for man power. The recommendation that unnecessary statistics be eliminated affects all departments, but the operating more than any other, perhaps. Probably steps have already been taken to do away

with unnecessary statistics on many roads but it is safe to say that there is still a great mass of figures being compiled which is pretty nearly useless, arriving at the general manager's desk, as it does, forty-five to sixty days after the events recorded. Supervision by means of statistics is more than ever essential under present circumstances but a few logical and searching reports made up within a few hours of the events recorded are more effective for purposes of supervision than an armful of reports completed "the fifteenth of the following month." Operating officers and executives especially ought to read every word of the accounting officers' committee report.

THE FAILURE, NOT OF RAILROAD ADMINISTRATION, BUT OF RAILROAD REGULATION

THE government is going to take direct supervision of the railroad management during the war. It is going to do this because our present system of railroad regulation has broken down. The Interstate Commerce Commission recently has made two important reports which bear directly on this subject. One is its annual report for 1917; the other, the special report regarding the need for unification of railroad facilities which it sent to Congress on December 5. The former is a vindication of the operation of the railways since the United States entered the war; the latter, as we view it, a condemnation of much of our past government regulation of railroads.

Those who say the need for government supervision of operation during the war is due to a break-down of railroad management should read these two reports and ponder their significance when taken together.

In its annual report the Commission said: "Transportation conditions have been abnormal throughout the entire country during the past year. * * * Even before our country was drawn into the war the railroads were handling an extremely heavy traffic, heavier by far than at any time in their previous history. This was greatly increased by the war. * * * Since 1907 there were few times when the number of freight cars available did not exceed the number required for the transportation of the country's commerce. * * * As a result of this condition, there was slight incentive to secure additional equipment, and on many lines the idle cars were allowed to deteriorate."

The recent enormous increase in traffic, as the Commission points out, rapidly wiped out the car surplus. "Through the railroads' Commission on Car Service efforts have been made to relieve the difficulties resulting in car shortage and congestion. * * * Without attempting to detail the activities on the part of the railways through this organization, it will suffice to say that they have responded to and supported the executive committee (i. e., the Railroads' War Board), which in an earnest way has attempted to deal with the vexatious and troublesome questions and to meet the unprecedented demands upon the railroads. * * * While conditions have been extraordinary and while traffic is not always moved as carriers and shippers would have it moved, the essential needs of the country have to date been cared for. Much was said during the past winter as to the danger of freezing and famine on account of failure adequately to transport fuel and foods, but history will record no such calamity."

In the entire report there is not a word of criticism of the railroads for what they have done or not done since the country entered the war. The conditions have been abnormal and the railroads, with the co-operation of the Commission itself and the shipping public, have done the best they could in the circumstances. This, in substance, is the Commission's report.

Fully as significant as what the Commission says in its annual report, and even more forcefully worded, are the views

expressed by Secretary of War Baker in his annual report for 1917 (pages 39-40) regarding the way in which the railroads have co-operated with the War Department. He says:

"In this general connection it seems appropriate to refer to the effective co-operation between the department and the transportation agencies of the country. For a number of years the Quartermaster General's Department has maintained close relations with the executives of the great railway systems of the country. In February, 1917, a special committee of the American Railway Association was appointed to deal with questions of national defense, and the co-operation between this committee and the department has been most cordial and effective, and but for some such arrangement the great transportation problem would have been insoluble. I am happy, therefore, to join the Quartermaster General in pointing out the extraordinary service rendered by the transportation agencies of the country, and I concur also in his statement that 'of those who are now serving the Nation in this time of stress, there are none who are doing so more whole-heartedly, unselfishly and efficiently than the railroad officials who are engaged in this patriotic work.'"

Contrast this with what the Commission says in its special report of December 5 to Congress. Complete unification of the operation of the railroads is necessary, it declares. "If the unification is to be effected by the carriers," it continues, "they should be enabled to effect it in a lawful way by the suspension during the period of the war of the operation of the anti-trust laws, except in respect of consolidations or mergers, and of the anti-pooling section of the Commerce Act." The only alternative is the appointment of a government railroad controller who would be able to disregard these laws.

Why must the railroads in one way or another be freed from the anti-trust and the anti-pooling laws? Because, as the Commission points out, those laws were passed to compel the roads to compete, and they cannot secure the greatest efficiency in the utilization of existing facilities without eliminating competition and working as a single system. In other words, the great obstacles to securing maximum transportation efficiency in this crisis are law-made obstacles and not railroad-made obstacles. As a matter of fact, the Sherman anti-trust law and the anti-pooling law, as has been pointed out by the *Railway Age Gazette* and by other students of railway problems, with "damnable iteration" for many years, always have been obstacles to efficient railroad operation and regulation.

In its special report the Commission says: "The sudden, unforeseen and unprecedented demand for transportation occasioned by the war placed a strain upon the facilities and equipment of the railways which they were not and are not prepared to meet. There was created a need for immediate and extensive additions to existing facilities and equipment. The need is coincident with demands upon capital as well as upon labor, manufactures and natural resources such as we have never before known. Important additions and betterments will require new capital." The Commission recognizes it as its duty to grant rates to cover all necessary expenses and a fair return upon the value of the properties, but takes the view that no rates it could grant would enable the railways to compete successfully against the government in the open market for the new capital they require. Therefore, it suggests a direct government loan or guarantee to enable the railways to raise the needed capital.

It is true, as the Commission indicates, that nobody foresaw that a great war would cause such a large increase in the demand for transportation. But it has been foreseen and predicted for over ten years that some cause or combination of causes would sooner or later result in an enormous increase in business, and that then if the policy of regulation being followed was persisted in the transportation facilities of the country would prove to be inadequate. Rail-

way facilities have now become inadequate for the very reason that students of the situation foresaw they would, viz., because the various regulating bodies have refused to let the railways earn enough return to raise the capital required to make facilities adequate. Regulation so restricted the earnings of the railways that in the years 1914 and 1915 the percentages of return earned were the lowest since 1899. The period of enormous increase in traffic followed directly on the heels of this period when railroad net earnings, owing to unwise regulation, reached the lowest point in fifteen years. There you have the explanation of present transportation conditions—conditions which were clearly foreseen, which were repeatedly predicted, and which the kind of regulation we have had made inevitable.

Since the "break-down" is not a break-down of railroad management, but of railroad regulation, why did President Wilson consider it necessary to appoint a government controller for the railways? Apparently because he thought only a government controller could remove the obstacles to efficient operation and to needed increases in facilities which have been created by government regulation. If the President is right in this matter, it is quite evident that much of past regulation has been wrong.

TWO TYPES OF SNOW SHEDS

ON another page of this issue an account is given of a novel form of construction for the protection of railway tracks against drifting snow. The snow sheds there described are in marked contrast to the extensive improvements made by the Great Northern in the Cascade mountains which were described in last week's issue. This difference results from the fact that snow sheds are classified in two distinct groups designed to protect against entirely different troubles. The sheds on the Canadian Pacific in Rogers Pass and those on the Chicago, Milwaukee & St. Paul on the Great Northern in the Cascade mountains have been built to protect the railways from avalanches, heavy masses of snow and debris which sweep down the mountain sides and produce formidable obstructions to a railway occupying a bench in the slope. Here the construction takes the form of an apron or chute, built in the hillside over the track of sufficient strength to withstand the weight of the sliding mass as it passes over on its way to the bottom of the canyon. The sheds of the Southern Pacific in the Sierra Nevada mountains and the recently completed sheds of the Union Pacific belong to an entirely different class, the former being located on mountain sides of moderate slope and the latter in flat or rolling country. These sheds afford protection against drifting snow carried by never-ending winds of high velocity.

The snow sheds are confined to limited districts where the unusual conditions prevail. The westward slopes of the Pacific Coast ranges offer an unusual condition in an extremely heavy snowfall. The average annual fall in the vicinity of the Southern Pacific sheds is 35 ft. and a maximum of 65 ft. has been attained twice in 10 years. In the mountains of western Washington, annual snowfalls of 50 ft. are not uncommon. Unusual conditions of an entirely different nature demanded the construction of snow sheds on the Union Pacific and are described in the article referred to above.

These snow troubles introduce an enormous liability in railway operation. The construction and maintenance of the required protection represent investments of millions of dollars for which there is no compensation in the form of decreased operating expenses. The work described in this issue covers a form of permanent construction that has been carried to a degree of perfection which has justified its application on a large scale. In the case of the protection against snow slides, the use of permanent construction can hardly be said to have been solved satisfactorily. Reinforced

concrete has had only trial applications, while most of the recent construction has been entirely of heavy timber. As a result the expense for maintenance and renewals is great as can well be expected in any structure containing as much as 2,000 ft. b. m. of untreated timber per running foot. Even on the lighter construction used by the Southern Pacific the annual maintenance expenditure amounts to \$100,000.

GOVERNMENT CONTROL AND RAILROAD EFFICIENCY

THE public should understand just what the assumption by the government of control of railroad operation means. It will mean that the government will take control of an organization which has rendered to it and to the public more efficient service since this country entered the war than any organization which the government itself has formed especially to deal with war conditions.

What governmental department or organization will anybody attempt to show has done any better than the railroads? The record of the railroads repeatedly has been made public. It speaks for itself, and it speaks eloquently. But, it is said, the railroads have "broken down." With almost no additional facilities they have so increased their efficiency that they are handling 50 per cent more business than they were two years ago; and yet it is said, "they have broken down"; and the remedy is increased government control.

But where is the evidence that they could do any better under increased government control? Certainly it is not to be found in the storm of accusations of inefficiency which is now being poured upon the various government departments and bureaus. Almost every organization which the government itself has formed to help carry on the activities incidental to the war is under fire. The principal organizations of this kind are the Shipping Board, the Food Administration and the Fuel Administration. The Shipping Board is under attack in Congress because it has not made enough progress with the shipbuilding program. The Fuel Administration is under attack because it has not handled the coal situation efficiently. The Food Administration is under attack mainly because there is a shortage of sugar.

Likewise, some branches of the war and navy departments are under fire. The Surgeon-General of the army has alleged that many soldiers are suffering from cold and are sick of pneumonia because they have not been provided with proper clothing. The Ordnance Department is being denounced for various and sundry short-comings, including its failure to adopt the Lewis gun promptly or to provide General Pershing's army with enough arms.

The *Railway Age Gazette* does not pretend to know the merits of the controversies which have arisen regarding these and other matters pertaining to the government's handling of the situation. We believe the present chairman of the Shipping Board and his associates are men of great ability and are doing their best. But everybody knows that the work of shipbuilding has been terribly delayed by the protracted wrangling and constant succession of changes in personnel which have occurred in the shipbuilding organization. We believe the head of the Fuel Administration has done his best; but can anybody be found who believes his work has been constructive and successful in the big way the conditions have demanded? Most people whose opinion is of value think Mr. Hoover is a very able man, and that he has dealt with the difficult problem with great energy and effectiveness; and yet the Food Administration is receiving bitter criticism on various grounds and from various sources. It is true there has been a serious congestion on the eastern railroads; but that congestion itself was due largely to failure on the part of the government departments to exercise proper control over the issuance of orders for preference in the movement of freight.

There is grave uncertainty as to whether the government

has proceeded along all or, indeed, along most lines, with real efficiency. And yet it is soberly contended that it should take over the operation of the railways in order to increase their efficiency; and some of the very people who most savagely criticise the alleged inefficiency of the present government departments and organizations are the most energetic in contending that the railways, under government control, would be operated more efficiently! Their logic is remarkable. The government does other things badly; therefore, it would operate railways well.

THE PRESENT IMPORTANCE OF WATER TREATMENT

ONE of the essential requirements of steam railway operation is an adequate quantity of water for locomotive use. Second only in importance to quantity is quality. While the results of an insufficient supply of water are evident at once the detrimental effects of a poor character of water are not so readily observed though they are just as real. As a result the quality of railway water supplies frequently does not receive the consideration which it deserves.

The effect of an unsatisfactory water supply is reflected in locomotive performance. The *economy* of keeping an engine out of the shops and at work at all times is generally understood. The *necessity* for so employing it under present conditions should be realized by all railway men. At a time when the roads are overwhelmed with traffic, when they do not have enough engines to handle the business and when new ones cannot be obtained, every influence which tends to increase the amount of time that engines stand idle in the shops should be studied carefully and eliminated if practicable.

Poor water is one of the factors effecting locomotive performance adversely. Not only does it increase the consumption of fuel and shorten the interval between trips to the shop but it increases the number of engine failures on the line. If these conditions were not preventable, there would not be room for criticism but sufficient progress has been made to demonstrate that the quality of the water can be improved to the extent that these conditions can be removed in large measure if not eliminated entirely.

The lack of attention to water treatment has resulted largely from the failure of railway men to realize the full economies which can be effected. This has followed the division of responsibility for water service between the engineering department which procures and delivers the water to the engine, the mechanical department which uses it and the operating department which is dependent on its use for the hauling of traffic. No one department, therefore, sees the entire problem through. Another cause for this condition is the fact that on many roads the detrimental effects of bad water have existed so long that the managements have come to take them as a matter of course. They are not, therefore, giving the subject the consideration which it deserves. Other officers think only of the importance of treating the supplies at those points where extremely bad water is found and lose sight of the fact that large quantities of water with smaller amounts of scale-forming ingredients are also serious. Consideration of the condition at such points will also show the opportunities for vast improvement in many instances.

There has never been a time when the treatment of water has assumed the importance which it now bears to railway operation. The expense for the improvement of the water supply is so small in comparison with the benefits to be derived, particularly under present conditions, that the subject warrants the most careful consideration. The removal of solids from bad water is economical at any time. It is doubly so now when the roads are straining every nerve to furnish the transportation demanded by the country.

Letters to the Editor

WHY THESE UNNECESSARY STOPS?

ST. PAUL, Minn.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

On a certain single-track railroad equipped with the "A.P. B." automatic block system, there is a piece of maximum grade, adverse from X to Y. Between these points are three intermediate "stop and proceed" signals which we may designate as a, b and c. If the train, having passed a clear home signal at X finds one of the intermediate signals, say b, at stop, it must be brought to a full stop before proceeding, at reduced speed, to c, although there may be 4,000 tons behind the engine, to start which on the maximum grade is something of an undertaking, consuming much valuable time and occasionally resulting in a draw-bar pulled out and a double to Y. The stop indication may have meant one of many things, sometimes nothing more serious than a broken wire.

The object sought to be attained is the assurance that the train will be moved from b to c with such caution as would be indicated as necessary to the mind of a reasonable man trained in the business of railroading; but the method used to accomplish this end is an extremely unreasonable one.

I wish to submit the following, based to some extent on an experience of thirteen years as trainmaster and superintendent, directly responsible for the discipline of many men:

1. A rule requiring a train to be brought to a full stop at a signal under conditions such as described above is unreasonable and unnecessary [whether on ascending or descending grades or on a level], as all the requirements of safety can be met by reducing its speed to ten miles an hour.

2. To bring any train to a full stop at a signal in the expectation that the stop will have any effect on its being run carefully through the block is unreasonable, except that the stop, if it can be enforced, will limit the speed to that which can be attained thereafter.

3. An unreasonable rule is practically unenforceable, and, by comparison, a reasonable rule is easy to enforce.

4. A rule that is not enforced is subversive of discipline.

5. It is a waste of money to make unnecessary stops at any time and with any train, but especially so on heavy adverse grades.

6. Enginemen, in the main, are conscientious; take a pride in doing their work well, and do considerable thinking. These are human attributes for which they do not always get credit. They have no heart for an unreasonable rule, but can very readily see the necessity for a reasonable one.

7. Road foremen and trainmasters chronically wink at infractions of unreasonable rules.

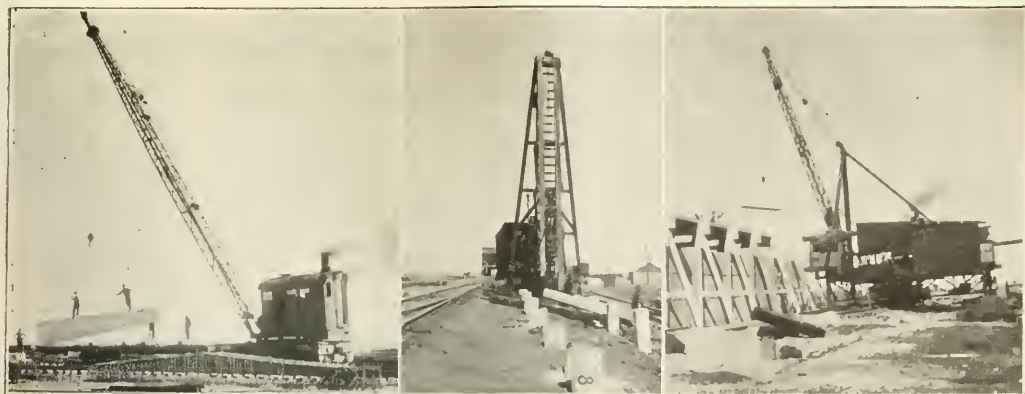
Therefore, the "stop and proceed" indication should be put in the scrap heap, and in its place there should be a permissive indication. Under such a plan the three aspects of a permissive signal would be "clear," "caution," and "extreme caution." No changes in present signals would be necessary.

Under such a plan surprise tests could be made as readily as now, and probably would be made more conscientiously. Discipline could be enforced as well as now, probably better, and business would be expedited.

The efforts that have been made to pull the teeth of the "stop and proceed" signal by using "grade" or "tonnage" permissive signals does not go far enough. The "stop and proceed" signal should be done away with altogether, except possibly in some very unusual locations.

A. M. BURT,

Chief Engineer of Maintenance of Way, Northern Pacific.



Handling Units with a Locomotive Crane. Driving Concrete Piles. Erecting the Shed at Rock River with the Special Traveler.

Concrete Snow Sheds on the Union Pacific

A New Form of Construction Has Been Provided to Protect This Transcontinental Line Against Drifting Snow

SIXTY-MILE gales, continuing for weeks, swept snow across the wide stretches of rolling plateau west of Laramie, Wyo., last winter and caused repeated interruptions to the heavy transcontinental traffic of the Union Pacific in spite of the tireless efforts of the operating and maintenance departments. Trains were blocked so often by drifting snow while taking coal and water at Rock River, Wyo., that 1,200 ft. of timber snow sheds were built in the midst of the stormy weather under very trying circumstances to alleviate the conditions at that point. Altogether the experience of the winter surpassed anything previously encountered within the memory of the oldest employees and

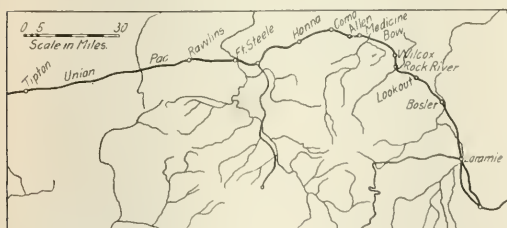
experienced last winter were at no time caused alone by the depth of the snow. Instead they were brought about by the almost incessant west and northwest winds which kept bringing fresh supplies of snow across the many miles of open country. The initial trouble occurred in the 18 miles between Rock River, Wyo., and Medicine Bow, and as the severity of the winter increased it was extended westward 20 miles to Hanna, and eastward 20 miles to Bosler. At one time snow troubles were experienced as far west as Tipton.

The condition encountered may be described as an almost steady stream of snow-filled air, traveling at velocities as high as 60 miles an hour, which formed deposits against any obstruction placed in its path. The snow in the air was all within about 60 ft. of the ground so that the sun was often seen shining in a clear sky overhead when conditions were at their worst. Under such circumstances the railroad cuts were the source of much trouble for even a standing train would stop so much snow that drifts would form around the wheels to a sufficient extent to block the train in the space of time occupied in taking water and coal. There were times when the track would become impassable three minutes after the passage of a snow plow.

Another peculiar phenomenon was the blowing of sand. At one time during the month of February six inches of sand, containing no small quantity of alfalfa hay, roots and all, was deposited on top of the snow drifts in White Rock cut, five miles east of Rock River.

RAILROAD MAKES A HARD FIGHT

The fight to keep the line open began after the snowfall in December and although no general tie-up of traffic occurred, it was necessary to continue the struggle for three weeks. Some additional snowfall with a renewal of the wind late in January called for renewed efforts, and with the gradual filling up of the cuts and the repeated passage of the snow plows, the difficulties were greatly increased so that the month of February was one long struggle. Portions of the line were blocked repeatedly for short intervals but there were only two general blockades, one of two days and another of three. However, it required increasing efforts with an ever-



Map of the Affected District

it is entirely possible that a like situation may not occur again in years. Nevertheless the management of the Union Pacific concluded that the demands for the uninterrupted movement of its trains are so great as to justify enormous expenditure for a permanent protection against these winter troubles. This decision led to the design and construction of reinforced concrete snow sheds, an entirely new form of protection against drifting snow.

THE WINTER OF 1916-17

The trouble started about December 20, 1916, with the fall of 12 to 14 in. of snow. This was the heaviest snowfall of the winter and is a relatively moderate fall as compared with some portions of the country, but the conditions

increasing organization to keep the trains running, until finally over 800 men, including the section crews, were employed in the 50 miles between Lookout and Hanna.

Ten snow plows were used, including four rotaries, one Gull plow, two Russell plows and three wedge plows. The extra gangs were assembled from the various divisions, 200 bunk cars being used to house them. Included in the boarding outfit were two standard dining cars and their regular crews.

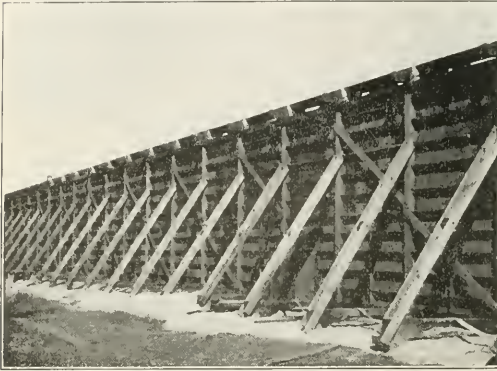
The difficulties of the work were aggravated by cold weather. A minimum temperature of 21 deg. below zero was attained and for six weeks the temperature did not go

tailed the rapid accumulation of special material was the fire protection system, consisting of a 4-in. wrought-iron pipe line with hydrants and 150 ft. of 2½-in. hose at intervals of 150 ft.

PERMANENT CONSTRUCTION AUTHORIZED

The experience of the winter, the expense of maintaining large forces of men to keep the track open, the interference with traffic and the danger of serious blockades led to the authorization of the construction of 8,270 ft. of permanent snow sheds. Subsequent study indicated the advantage of reinforced concrete, pre-cast in units and erected. Of the total amount of shed the largest single section is at Rock River, where there is a length of 4,441 ft. All of the timber shed constructed during the winter is retained in service except that the south 700 ft. was taken up and moved to the north end and it was further extended to make a total of 1,779 ft. The new concrete shed at this point extends south from the south end of the wooden shed as now located. In addition to this installation, there are three other sections of concrete sheds. One section of 500 ft. is on a 4-deg. curve at Sulphur Lake cut, between Allen and Komo, Wyo. Another section is 1½ miles west of Wilcox, Wyo., involving 1,500 ft. on a 1-deg. 6-min. curve. Another 1,800 ft. was installed on tangent track 1½ miles east of Medicine Bow.

In the last three named sections the shed covers only two main tracks, but at Rock River the shed 500 ft. covers a center passing track in addition to the two main tracks, while east of this point the two main tracks are spaced wider than 13 ft. for a distance of 200 ft. in making the spread for the passing track. The situation is further complicated by the need of provision for a siding, branching off from the main track east of Rock River.



Part of the Timber Snow Shed

above zero. The troubles with the standing trains at Rock River became so severe that it was concluded to commence the immediate construction of a timber snow shed covering the tracks each way from the coaling station.

QUICK WORK ON TIMBER SNOW SHEDS

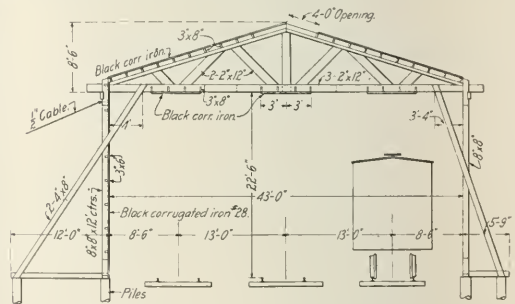
The character of the frame snow sheds is shown in one of the drawings, from which it will be observed that they are intended purely for protection against blowing snow. The roof trusses and the 8-in. by 8-in. posts which support them are spaced 12 ft. center to center along the track and are covered on top and on the windward side by No. 12 black corrugated iron, secured to 3-in. by 6-in. purlins. The winds causing the snow trouble were westerly (the line at Rock River runs north and south) so that it was not necessary to provide any protection on the east side. The structure was braced against collapse by a batter brace; but more dependence was placed on lines of ½-in. wire cable extending from every alternate bent to dead-men buried 50 ft. west of the west wall of the shelter. The shed covers three tracks, two main lines and a central passing track. The trusses directly above each track are protected from cinder blast by a strip of corrugated iron 6 ft. wide.

Twelve hundred feet of this form of shed was built during the severe weather in February. To as large a measure as possible, the material was prepared for ready erection before arrival at the work. The columns and bases and the trusses were framed at Cheyenne, 100 men being employed on this work, in addition to 100 men used on the erection. The sheds are supported on pile foundations, the piles being driven a sufficient time in advance to keep ahead of the erection work.

The construction of these sheds in this emergency required the accumulation of a large amount of material from all sources. This included lumber, hardware and corrugated iron, considerable quantities of the latter being shipped from the east in baggage cars. One feature of the shed that en-

THE DESIGN

One of the drawings shows the standard design for two tracks, which is in reality a simple structure, consisting primarily of a succession of concrete bents or frames erected along the track every 15 ft. Each bent consists of two unsymmetrical A-frames, supporting a reinforced concrete girder spanning across the track. The space between the verti-



Section of the Timber Snow Shed

cal legs of the A-frame and between the tops of the girders is enclosed by reinforced concrete slabs. The clearance provided by this structure is ample, as indicated in the drawing.

The structure is designed to withstand a working load of 50 lb. per sq. ft. of wind pressure on the side wall and 50 lb. per sq. ft. of live load on the roof in addition to the dead load. Under a condition of no wind, the load of the structure is practically all carried on the vertical legs of the A-frames. The batter legs come into play under the condition of lateral wind pressure. The designing unit stresses for the concrete were 650 lb. per sq. in. maximum

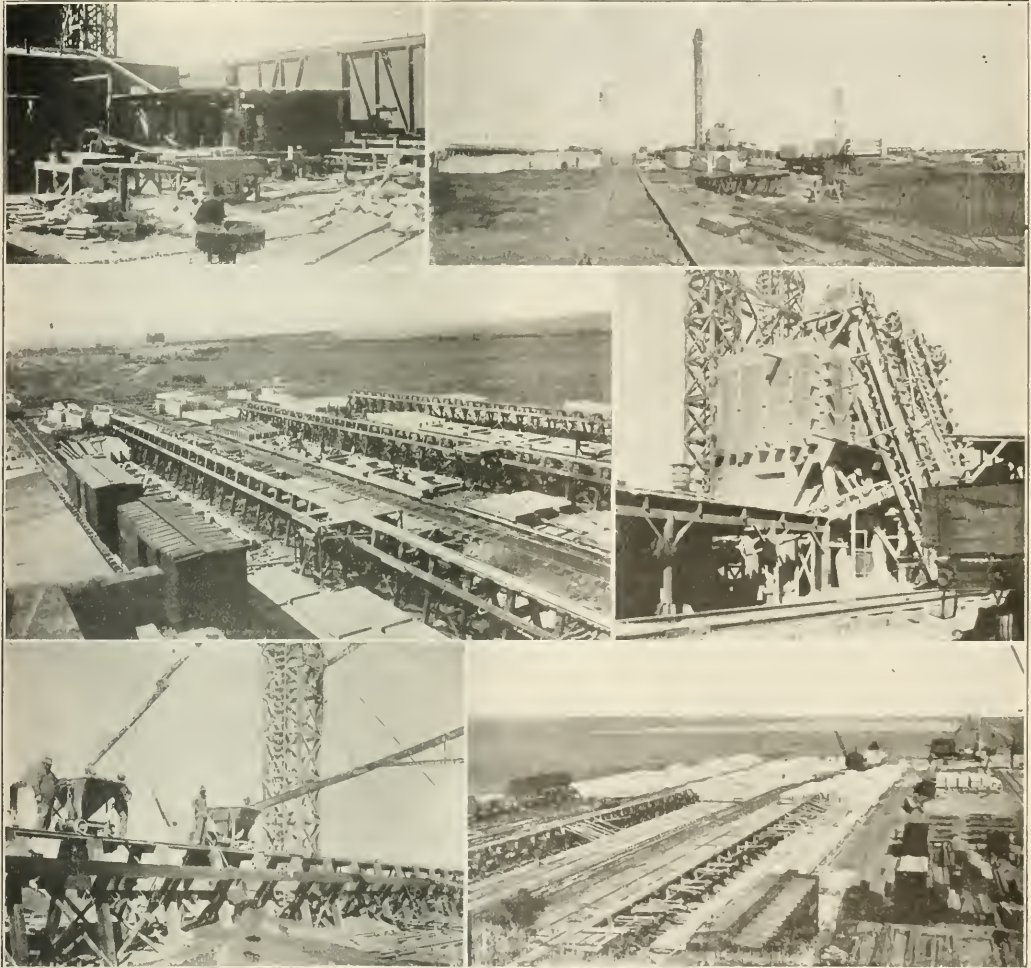
compression in flexure, 540 lb. per sq. in. compression under axial load and 40 lb. per sq. in. in diagonal tension. The working stresses in the steel were 16,000 lb. per sq. in. in tension and 9,750 lb. per sq. in. in compression.

Responsibility for the success of the design is due in a considerable measure to the details of the connection between the units, which afford adequate load-carrying capacity while permitting ready erection. The footings were fitted with pockets to receive the bottoms of the A-frame legs. Anchorage against overturning is provided by 1¼-in. bolts,

The sides of the A-frame columns perpendicular to the tracks are equipped with grooves to receive the ends of the side slabs as they were slid down into position from the top. The top slabs rest on the top surfaces of the girders and are prevented from sliding off by raised stops formed in the concrete of the girders.

SOME STRUCTURAL STEEL REQUIRED

The additional tracks and the special track spacing covering part of the site of the shed at Rock River entailed the



The Form Shop
The Pouring Yard
Spouting Concrete into Hopper Cars

The Concreting Towers
The Mixer Plant
Pouring Yard with Storage Yard in the Distance

set in the outside pockets and passing through a 2-in. pipe sleeve in a toe extension on the outside legs. Similarly two ¾-in. bars projecting from the top of the A-frame passed into 2-in. pipe sleeves in the ends of the girders as the latter were lowered into place. The joints between the uprights and the girders were further protected by lugs cast on the underside of the girders on both sides of girder bearings.

use of a large amount of special construction. Where the main tracks are spread a sufficient amount to secure the desired clearance, a row of columns was placed along the center line between tracks, but where the passing track occurs this was not permissible and a clear span of 48 ft. was required. The turnout for the side track east of the station required a maximum span of 41 ft. 4 in. Designs in reinforced con-

plants. All parts of the forms were cut to templets and put together on assembling tables, thus eliminating all measuring after the pattern form had been made for each style of concrete unit. The forms were oiled preparatory to each pouring of the concrete with a paraffin base oil.

The reinforcement consisted of No. 27 triangular mesh in 54- and 56-in. widths, $\frac{1}{4}$ -in. plain rods and corrugated bars of various sizes. A set of tinsmith's rolls were used to flatten out the rolls of wire mesh. A line from a hoisting engine served to pull the mesh through the rolls and onto a long table, where it was cut into the desired lengths with hand shears, cleats nailed to the top of the table serving as guides for the cutting.

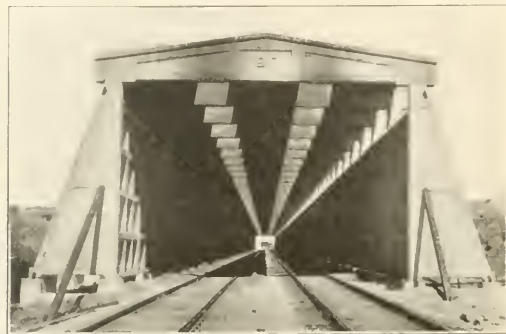
Although the unit character of the work called for the use of a great many bars of equal length, the conditions of the steel market made it imperative to order the bars, of which 1,500 tons were required, as soon as the plans were at a stage to give an approximate idea of the requirements. Obviously the exact bills of bars were not ready at that time and in consequence stock lengths were ordered, thus requiring the bars to be cut to special lengths in the field. The reinforcement for the various units was assembled into complete "cages" before placing in the forms. They were supported clear of the bottom forms by means of small blocks of concrete prepared for the purpose. For the larger units it was necessary to handle the assembled reinforcement with locomotive cranes.

AN ACCURATE RECORD OF THE UNITS WAS KEPT

The manufacture of a large number of units of various kinds, their storage for a sufficient time to insure proper curing,

the class mark of the unit in any given section of the yard was noted on a sign board nailed to the side of the hopper car trestles for identification. As fast as the units were cast they were marked with the class number and the date of pouring.

Three separate records of the units were kept in the superintendent's house in the cement storage building close to



South Portal of the Concrete Shed at Rock River, Wyo.

the mixer. Blueprints of the erection diagram, showing the position of each unit in the four sections of shed, were marked up as each piece was concreted. A large chart mounted on the wall served as a record of the number of units cast each day, the total number concreted to date and the amount of material used. In addition to this there was a storage yard diagram containing a record of the date on which the units were cast and the date they were shipped for erection.

The wall and roof slabs were removed from the forms and placed in the storage yard after three days and the girders and columns after seven days. All units were cured in the storage yard at least two weeks before removal for erection, and were kept moist by sprinkling during the entire period. Five locomotive cranes were used for the various lifting operations in the concreting and curing yards. The spacing of the tracks and the hopper car trestles was such that the cranes could readily pick up loads placed anywhere within the yards. Two switch engines were in service daily, handling material and hauling the units to storage or to the point of erection.

TWO ERECTION METHODS USED

The general methods of erection were adopted. At Rock river the erection equipment consisted of a special stiff-leg-derrick with a 96-ft. steel boom on a triangular steel frame equipped with rollers. The machine was rolled on blocking on the north side of the tracks at a sufficient distance to clear the tracks and structure. A temporary track was built in the path of this derrick for the delivery of the units on cars. A photograph shows this derrick in the operation of setting one of the roof slabs. The length of the boom was sufficient to permit the erection of 60 lin. ft. of shed from a single set-up and the speed of erection was such that the derrick was shifted about once each day.

At the three other snow sheds, all of which are located in cuts, the erection was carried on by the use of locomotive cranes. One crane operation on a track over the side ditch in the cut and clear of the main track erected the A-frames and wall slabs for one side, backing away as the work progressed. A larger crane with a 70-ft. boom operating on a "high line" on the natural ground on the opposite side of the cut erected the A-frames on the opposite side of the shed as well as the cross girders. The first crane was then trans-



An Exterior View

ing, the delivery of the units as needed for erection, the delivery of the units broken in handling and other contingencies arising requires the formulation of an efficient system of accounts covering all operations on the units from the time that they were cast until they were erected. The concreting yard was divided into sections containing a definite number of forms of the various classes and this number together with

ferred to the "high line" and erected the remaining side wall slabs and the roof slabs. The smaller crane erected about 300 ft. of A-frames and side walls per day.

The joints between all units of the structures were treated with cement mortar or asphalt or a combination of the two. The beds of the A-frames in the footing, of the girders on the columns and of the roof slabs on the girders were covered with a layer of cement mortar before the units were placed. The longitudinal joints between the roof slabs were closed with mortar but the transverse joints in the slabs over the tops of the girders were filled with asphalt. This material was also used in the joints of the side wall slabs in the grooves of the columns. To facilitate the placing of this filler the slabs were held in exact position in the grooves by means of wedges until the edges of the joints on both sides were closed up with cement mortar to form a dam that would hold the asphalt poured in from the top. All of the mortar

Houghton Construction Company of San Francisco was the contractor.

HOW CAN WE DO THE SAME AMOUNT OF YARD WORK WITH FEWER MEN?

By S. W. Wherry

Yardmaster, Pennsylvania Railroad, Altoona, Pa.

The indications are that the railroads as well as the other industries are going to face a shortage of men this winter, which with reference to the men in train service, is going to interfere seriously with commerce. This being so it would seem that the only thing to be done is to get more service out of the men we have. While this can possibly be done to some degree with men in road service, it is in the yards that it can be carried out to the fullest extent, this being



Interior of the Shed at Rock River

used was tempered with hydrated lime to make it work better on the trowel.

The work on the reinforced concrete sheds was commenced on May 20, when the contractor moved in his equipment; by August 6 the plant had been completed and forms had been built so that the concreting could be commenced. The erection of sheds was started on August 20. From 350 to 400 men were employed on the work. Eighty men on the forms; 30 on each mixer and 20 for each erection gang comprised the principal units of the force. One rather unusual arrangement of the contract was that the railroad company boarded the contractor's men.

The reconstruction of the wooden sheds was carried on by company forces. Besides shifting the sheds further north and the construction of about 500 ft. in addition, this work included fire protective measures, that is, the covering of all of the truss members with cement mortar placed on expanded metal lath.

The entire project has been carried on under the direction of W. R. Armstrong, engineer maintenance of way of the Union Pacific. The designs were developed and the plans prepared under the direction of W. L. Brayton, bridge engineer of the Union Pacific, and the construction was under the supervision of L. W. Althol, resident engineer. The

especially true with men engaged in classification work—usually the major portion of the yard forces.

It is generally the case that where car riders are averaging two and one-half cuts per hour, or twenty cuts in eight hours, and they see that they can benefit by riding more runs in order to finish a train in time to get an "early quit," or the last train in the yard is being shifted and there are prospects of a "flat," they will speed up to three or three and one-half cuts per hour, but to do this requires every man connected with the operation to keep hustling and under present methods it cannot be done all the time regardless of the efficiency of the supervision, unless the men have some object in view for which to work. It is evident that the only way to get a man to do all he can, instead of all he has to, is to give him some incentive to work for and to reduce the amount of energy he is required to expend doing things which bring no return.

A number of methods of increasing the number of cuts handled per man per day at the classification humps have been tried out in almost every yard in the country without any great amount of success. Probably the most satisfactory is that of having a check clerk stationed at the hump keep a record of the time each man leaves the hump and returns to it, imposing discipline for consuming unnecessary time,

but this method, like many others only provides for the punishment of the men who do not do the average amount of work and does not provide for rewarding the men who do more than the average. If a man is dropping a car into a classification yard and he sees that by holding the car up just a little he can arrive in time to miss the pick-up on the return trip, it would not be human nature for him not to do so in nine cases out of ten, unless it is to his advantage to catch that pick-up.

Under present conditions the suspension of a man is more of a penalty to the railroad company than it is to the man, and it is my experience that the only reliable incentive for a better effort in a man is the effect it will have on his pocket book, so that under the present labor conditions the best way to get the car dropper to increase his average work is to pay the established rate for a day's work and then pay a bonus for all cuts over a predetermined number ridden by a man in a day. This bonus should be the average amount paid per cut for the predetermined number. It should be arrived at by taking the average number of cuts per man at that point for a six months' summer period from May until November, and a six months' winter period from November until May, the averages to be used as bonus bases during these periods.

One of the objections to this scheme is that the men assigned to classification crews would likely object to doing necessary work other than riding runs, but this could be overcome by giving credit for cuts for the time he was engaged in other work in proportion to the average time required to drop a car into the yard and return to the hump at that particular point.

Another objection might be that the men would not drop their cars against the other cars on the classification tracks in order to get back to the hump quickly, but as this would be such a disadvantage to the men on account of the delay while cars were being backed down, I do not think it need be considered.

Of course it might result in reckless car riding and resultant damage to equipment; this would have to be overcome, possibly cutting the men who are responsible for damage out of the bonus privilege for a stated period, thus taking the incentive away from reckless riders.

The greatest benefit to be derived from the system would be that the car riders would likely raise very strenuous objections to any unnecessary delay which would cut down their bonus earnings and would tend to keep other employees working in connection with hump operations "on their toes."

When I refer to energy expended by car droppers for which no return is received by the railroad company I mean that which is used by the men in crawling across cars standing on the classification tracks to reach the pick-up track, in walking to the hump where there is no pick-up service or where the pick-up does not run the entire distance to the hump, and by reshifting cars which have been improperly classified.

It requires considerable more time and effort for a man to return to the hump after having ridden a car into the classification yard, than it does to ride the car down, as it is necessary to get up and down off the cars on from one to a score of tracks, depending on the size of the yard and the positions of cars on the various tracks. To overcome this useless expenditure of energy a better pick-up service must be installed. Unfortunately, it appears that when a majority of classification yards were laid out the main thought was in getting the cars down into the yard and very inadequate facilities were provided for getting the men back. About 50 per cent of the yards have the pick-up track on the first track leading off the ladder track instead of on the last, so that if a man takes a car on to any track he must cross cars to get to the pick-up track, whereas if the pick-

up track ran along the ladder track the men taking a considerable number of the cuts into the yard could cross the upper ends of the tracks to the pick-up track. If I had the designing of new classification yards I would provide subways under the yard to reach from one side to the other, about fifteen or twenty car lengths apart and with openings between every other track, so that a man would never have to crawl over a car to get to the pick-up and would not have more than eight or ten car lengths to walk to get to the subway.

However there is no time now to rebuild yards but I believe that a better arrangement of pick-up facilities could be made in a number of yards, and where the size of the classification yard warrants, two pick-ups could be used to advantage. This would perhaps be an expensive arrangement if locomotives were used for both pick-ups but by substituting gasoline, or electric storage battery motor cars the expense would be reduced. There does not seem to be any doubt but that the gasoline motor car should make an efficient, economical pick-up car, but the cars which I have seen used at various points for this work are small two-cylinder affairs which were built for entirely different service. When it is figured that in the average yard a pick-up makes an average of eight one-mile trips each hour with a load of about 12 men and keeps this up for 24 hours a day it would seem that a specially designed car would be required, with an engine of about the same capacity as a 3000-pound commercial truck.

In my estimation one of the good features about a gasoline motor pick-up car is that the assistant yardmaster or conductor in charge of the hump operations cannot use it for other purposes as he can a locomotive. The use of the pick-up engine for other work, unless it is absolutely necessary, is one of the most expensive things which can be done at a classification hump.

Overcoming the reshifting of cars improperly classified is a considerable task and there seems to be no efficient remedy for it, as it is almost impossible to keep all the cuts far enough apart on the ladder track to throw the proper switches and the levermen are very apt to make mistakes or lose cars on the ladder. However a little better co-operation between scale forces and yard forces at classification yards situated at scales would doubtless avoid some of this work, while a campaign of education should be conducted with the minor officers in charge of yard work so that judgment would be used in deciding whether it is not better to leave the car in the wrong classification and notify the man in charge of the despatching work to have a make-up crew shift the car out at the despatching end, which would probably take a crew consisting of one engine and three trainmen 20 minutes, rather than hold up a classification crew, consisting of two or more engines and from 15 to 20 men, 8 or 10 minutes.

If blocked receiving yards are to be avoided this winter it is time something was done to secure more efficient service from the men we have; and as the bonus system would not increase the cost of handling cars over the humps, although it would increase the individual earnings of the men, I believe that it is one solution of the problem. Under present conditions a man can easily get another position if he loses the one he has, and the old system of discipline reacts to the disadvantage of the railroad company. Strict supervision and penalizing have lost their effect, and we must try something different.

RAILWAYMEN AND AIR RAIDS.—Delegates from the National Union of Railwaymen in the London district have recommended legislation to place railwaymen who are killed or injured during air raids on the same footing in the matter of pensions as sailors and soldiers.

NEWLANDS COMMITTEE HEARING

The Newlands Joint Committee on Interstate Commerce on December 20 concluded its series of hearings begun on December 10 for the purpose of receiving the testimony of state railroad commissions, and adjourned subject to the call of the chairman.

A substitute both for government ownership or operation of railways and for the present system of private ownership of competing corporations was proposed as a solution of the railway problem by Ex-Senator Joseph L. Bristow, the concluding witness before the committee. Mr. Bristow is chairman of the Kansas Public Utilities Commission and chairman of the legislative committee of the National Association of Railway and Utilities Commissioners, but explained that this proposal represented only his personal views.

Mr. Bristow proposed, as a method of eliminating the evils resulting from private competition, a merger of all the railroads of the country under government supervision by the organization of a national bureau or corporation with directors appointed by the President, to acquire the railroads as a trustee by issuing stock, and that the Interstate Commerce Commission should be directed by law to prescribe rates sufficient to guarantee a dividend of from 4 to 6 per cent on the stock after payment of operating expenses. The separate organizations of the railways under his plan would thus be gradually eliminated so that the strong roads would sustain the weak roads. The operating officers would be appointed by the government directors, but there would be no necessity for taxation, he said, either to pay for the roads or for their operation, and the government guarantee would take nothing out of the treasury because it would be provided for in the rates.

"This stock should have no voting power," Mr. Bristow said, "and would not be a government obligation but an obligation on the railroad property itself. I don't think there could be any greater security. There would be none of the evils of competition and the strong roads which now do not need any increase in rates would sustain the weaker roads which now cannot be given rates that would give them an adequate return without swelling the earnings of the roads already earning a fair return. I don't think you can remedy the defects of the existing system without changing the system. The operation of the railways is all right now. The difficulty comes when the revenues are not enough to satisfy the bankers that control them. This would give us common ownership. I am not in favor of government ownership. I do not believe the government ought to buy the railroads and pay for them by taxation nor do I believe in taxation to pay for their operation. It would be too easy to levy a tax in case there should be a deficit from government operation."

As a basis for determining the value of the railroads under this plan, Mr. Bristow suggested taking the average market value of their stocks and bonds for a period of five years. This, he said, represents what the investor has considered the railroads' worth. As an alternative plan, he said, the valuation can be determined by waiting until the Interstate Commerce Commission has completed its valuation.

"I would not have the railroads operated by government officers," he said. "I am afraid government ownership and operation would be disastrous. Under my plan the political power of employees might be increased, but I doubt if it would be as great as it is now because their interests would be balanced against those of the shippers and the public. I think the public would always be willing to pay rates sufficient to pay good wages." He suggested that there is now rather a strong tendency on the part of the public to be indifferent to the merits of a wage controversy because

it assumes that the higher wages would come out of the pockets of a few rich men.

Mr. Bristow began his testimony by introducing a table prepared by J. P. Norton, a bond expert, giving the market prices and yields of the stocks and bonds of 20 railroads since 1890. This showed, he said, that the credit of the railroads has been good and if it has recently declined it has been rather due to the campaign of publicity conducted by the railroads depreciating their own financial condition rather than to any action of the state commissions.

Mr. Bristow said he would favor federal regulation of security issues provided the states should have the right to be heard and heard effectively in matters in which the people of a state are more interested than the nation at large. He objected to exclusive federal regulation of rates, saying that the state commissions can adjust many minor local complaints promptly and with knowledge of local conditions, which it would be too expensive to take before the Interstate Commerce Commission.

Federal officers, he said, would not be so close to the people and would not enjoy the confidence of the people to the same extent as state officers. Regional commissions having jurisdiction only over interstate matters he thought would be desirable.

In reply to questions by Representative Sims, Mr. Bristow said he would not change the present system of railroad taxation by the states, but he did not think railroad property should be taxed twice, once as property and again in the form of a tax on securities. He thought comparatively few states had that form of taxation.

Senator Newlands remarked that another senator had told him that there was almost no investment in railroad securities by people in his state because they are subject to taxation at such a rate that only tax-dodgers can afford to own them.

Mr. Bristow also said that state commissioners have been made "the targets for railroad press agents" and that they have been "much embarrassed" by railroad publicity. The Kansas commission has no publicity agent, he said, but has recently adopted the plan of issuing a bulletin which is sent to newspapers, for the purpose of showing what the commission is doing. He presented a copy of this bulletin which contained a reply to a magazine article which it declared misleading and also contained articles commenting on the "prosperity" of the railroads.

While Mr. Bristow said this bulletin is published for the purpose of informing the people of the activities of the commission, the copy he presented contained one page devoted to a list of hearings and orders issued by the commission, while the remaining three pages were principally devoted to other matters. One article was devoted to showing that 1917 was a good year for western railroads by comparing the 1917 figures with those of 1915. There was another long article on "Industry Suffering From Lack of Cars." One page was devoted to the editorial referred to and an article to show that the Missouri Pacific "is prospering now."

IMPROVING PORT FACILITIES IN EAST AFRICA.—The port of Lourenço Marques, one of the best in southern and eastern Africa in its wharf accommodations, is being made better able to serve a greater number of steamers than formerly. Arrangements have been made by agreements between the Portuguese Railway administration and the South African Railways whereby the facilities for transporting coal from the Transvaal collieries to Lourenço Marques will be increased about double the amount of present tonnage. This will be brought about by pooling the engine power of the two railway systems and by reserving certain trucks for coal traffic only. The Lourenço Marques Railways have recently added three new American locomotives of the Santa Fé type to its engine power.—*Commerce Report.*



New York Central 4-8-2 Type Locomotives

First of This Type for Freight Service; Requirements
Are High Sustained Capacity on Low Grade Line

ABOUT one year ago the New York Central received from the American Locomotive Company an order of 30 locomotives of the 4-8-2 type, which in several respects are the most notable locomotives of this type yet to be built.

Heretofore locomotives of this wheel arrangement invariably have been built to handle heavy passenger trains over mountain grades under conditions making difficult the maintenance of schedules with Pacific type locomotives. Locomotives of this wheel arrangement have therefore come to be known as the Mountain type. On the New York Central, however, the 4-8-2 type locomotives have been built for freight service on a line with comparatively few grades, on which, to an unusual extent, car limits determined by operating con-

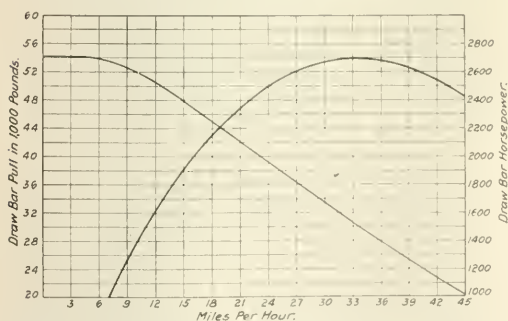
Tractive efforts developed at the various speeds and the corresponding drawbar horsepowers are exhibited by the drawbar pull-speed chart, plotted from results obtained in dynamometer car tests with a steam pressure of 200 lb. per sq. in. It will be noted that the tractive effort of the locomotive is well sustained at the higher speeds.

On the basis of Cole's ratios, these locomotives should develop a maximum cylinder horsepower of 2,683 at a piston speed of 1,000 ft. per minute. In determining the ratio of boiler capacity to maximum cylinder demand, Cole's ratios are based on a steam consumption of 20.8 lb. per indicated horsepower-hour for superheater engines, and the grate is proportioned to burn four pounds of coal per indicated horsepower-hour at a rate not to exceed 120 lb. per square foot of grate area per hour. On this basis of comparison, the evaporative capacity of the boiler is equal to 98 per cent of the maximum cylinder demand, while the grate area is proportionately slightly smaller.

The boiler is of the conical type with an outside diameter of 81 7/16 in. at the first ring. The engines as originally built carried 185 lb. but the boilers were designed to carry a working pressure of 200 lb. and the pressure has been raised to 190 lb. per square inch since the engines went into service.

It will be seen that instead of the usual type of rod braces at the front and back heads, the heads of the boiler of the "Mohawk" type locomotives are braced with gusset sheets, the ends of which are bolted between angle bars forming the flanges for attachment to the boiler head. Where attached to the roof sheet the back head braces are flanged to conform to the curve of the sheet, while each front gusset sheet is bolted to the radial leg of an angle bar which forms the flange for securing the brace to the boiler shell. The longitudinal seam of the dome course is on the top center line, directly under the dome. It is of the butt joint type with inside and outside welt strips and the butt joint is welded throughout the length of the seam. The dome is of pressed steel formed in one piece and the flanges are extended in strips 13½ in. and 14 in. wide respectively, in front of and back of the dome, to form the outside welt strip of the barrel seam. The inside welt strip is bifurcated at the dome and forms the reinforcing pad under the dome flange.

There are no unusual features in the firebox construction. It is fitted with a Security brick arch carried on four tubes three inches in diameter and has a barrel combustion chamber which extends forward into the barrel of the boiler 40 7/8 in. beyond the firebox throat sheet. The tubes and flues are 21 ft. 6 in. long, measured over the tube sheets. As built, the



Drawbar Pull and Drawbar Horsepower Characteristics of
the N. Y. C. 4-8-2 Type Locomotives; Boiler Pressure
200 Lb. per Sq. In.

ditions and facilities other than motive power are the determining factors in the length of trains. The type name generally applied to these locomotives is obviously a misnomer in this case and these locomotives have therefore been styled the "Mohawk" type on the New York Central, after the name of the division upon which they were first placed in service.

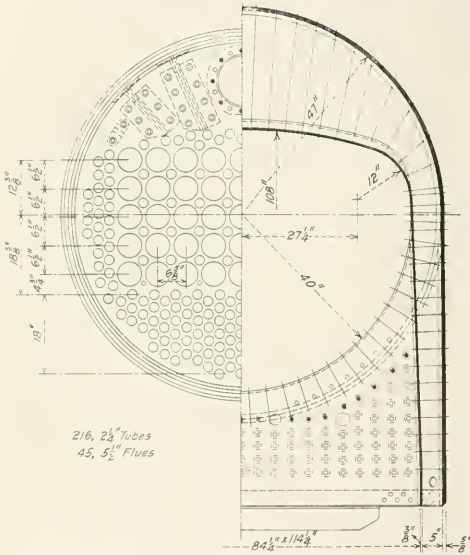
It will be noted that the average load per pair of driving wheels in the case of the 4-8-2 engines has been kept well within 60,000 lb., and they have been designed to take curves up to 19 deg. With their well designed reciprocating parts they should cause little difficulty in the maintenance of track.

locomotives are hand-fired through two firedoor openings which are closed with air-operated firedoors.

The front end arrangement includes a 6¾-in. exhaust nozzle and a 19-in. stack extension which extends down to a point 3¾ in. above the center line of the smokebox.

The main frames and the single front rails under the cylinders are cast in one piece on each side. The top rail over the pedestals has a section 6 in. wide by 7 in. deep. The lower rails are 4½ in. deep at the smallest section, increasing to a depth of 5¼ in. over the ends of the pedestal binders. The rear frame and back deck plate are an integral steel casting, the forward ends of which are bolted to the rear ends of the main frames. The radius bar fulcrum, the pockets for the rear ends of the trailer springs and the trailer equalizer bar fulcrums are all an integral part of this casting.

With the exception of those for the main pair of drivers,

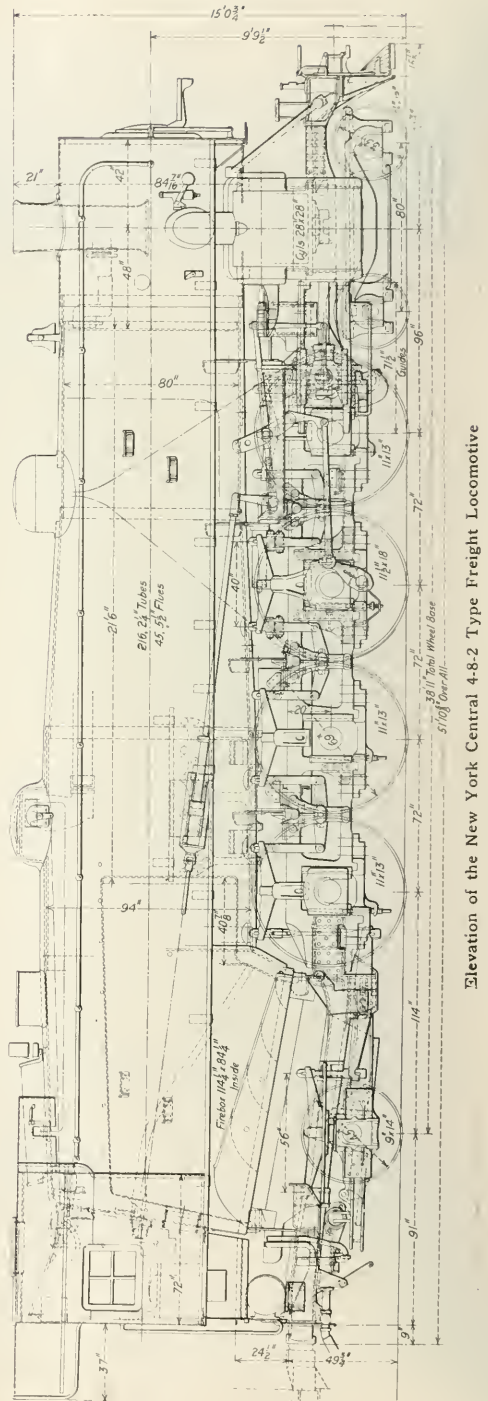


The Tube Sheet Layout and Section Through the Firebox

the driving journals are 11 in. in diameter by 13 in. long. The journals of the main drivers are 11½ in. in diameter and 18 in. long. Except for their length, the driving boxes used on this axle are similar in construction to those ordinarily used where the center line of the driving box and the center line of the frame coincide. The main jaws are widened by the use of steel castings which are bolted against the inside face of the pedestals. These castings also perform the function of frame cross ties. By the introduction of offset cross equalizers in the spring hanger system at either end of the main driving springs, the position of the main springs has been moved in so that they are located directly over the longitudinal center line of the driving boxes. Each spring rests in a saddle of the usual type designed to clear the offset position of the frame rail relative to the center line of the box.

Steam is admitted to the valve chambers through an outside dome connection type of throttle valve and distributed by 14-in. piston valves having a travel of 7 in. The valves are operated by the Walschaert valve gear, fitted with the Ragonet power reverse gear.

The engines are fitted with Woodward engine trucks and Cole radial trailing trucks. The engine truck has a swing of 4¼ in. on each side, and the swing of the trailing truck is 5¼ in. on each side.



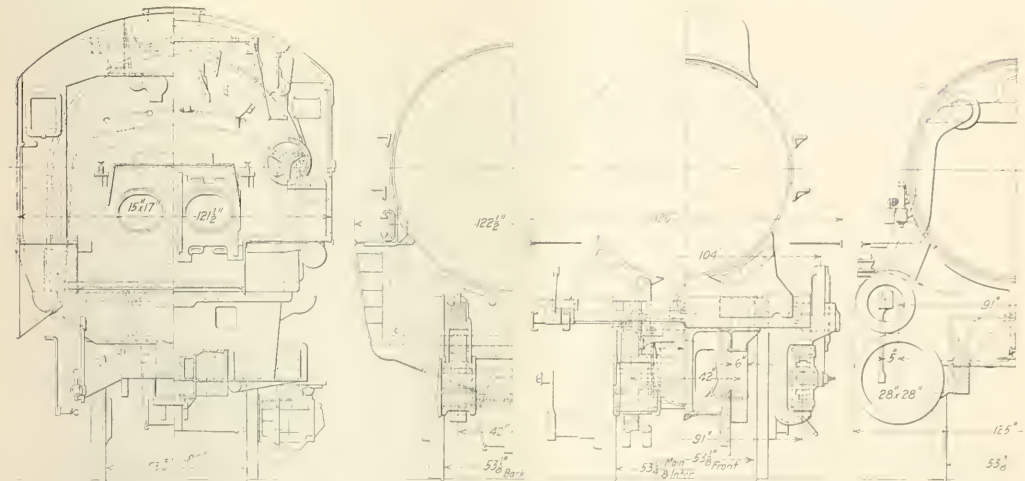
Elevation of the New York Central 4-8-2 Type Freight Locomotive

It is evident that the development of the full capacity of a locomotive capable of delivering 2,600 indicated horsepower with a coal consumption of approximately three pounds per horsepower-hour, thus requiring the combustion of about 7,800 lb. of coal per hour, is beyond the possibility of attainment by hand firing. As the locomotives are hand fired, they have never developed their full capacity in regular road service. They have been able to decrease the time required to

Weight on leading truck.....	32,500 lb.
Weight on trailing truck.....	56,500 lb.
Weight of engine and tender in working order.....	509,500 lb.
Wheel base, driving.....	18 ft.
Wheel base, total.....	38 ft. 11 in.
Wheel base, engine and tender.....	72 ft. 4 in.

Ratings

Weight on drivers ÷ tractive effort.....	4.6
Total weight ÷ tractive effort.....	6.7
Tractive effort × diam. drivers ÷ equivalent heating surface*.....	567.6
Equivalent heating surface* ÷ grate area.....	93.5



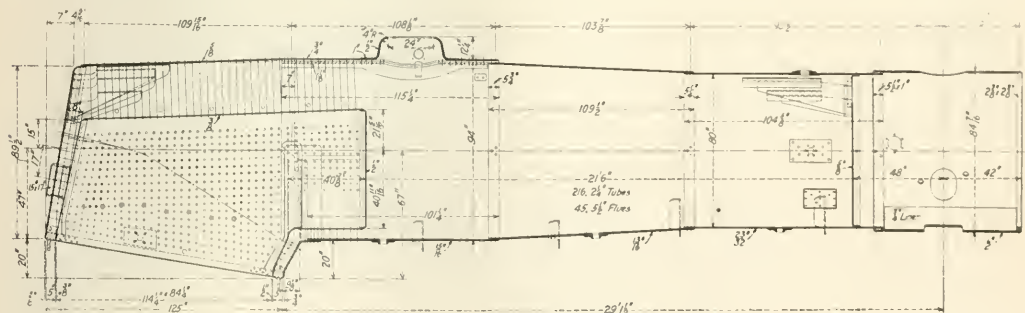
Cross Sections of the New York Central Locomotive

handle tonnage trains over the division, and in fast freight service they handle actual tonnages of from 2,500 to 3,500 tons, in adjusted tonnage trains of 75 to 95 cars, over a division 139 miles long in from five to eight hours' total time on the road. The engines have been built so that stokers may readily be applied whenever traffic conditions require the employment of their total horsepower capacity. In the mean-

Firebox heating surface ÷ equivalent heating surface* per cent.....	37.5
Weight on drivers ÷ equivalent heating surface*.....	55
Total weight ÷ equivalent heating surface*.....	31.2
Volume both cylinders.....	20 cu. ft.
Equivalent heating surface* ÷ vol. cylinders.....	3.3
Grate area ÷ vol. cylinders.....	

Cylinders

Kind.....	Simple
Diameter and stroke.....	28 in. by 28 in.



Sectional Elevation of the Boiler

time advantage is being taken of the more efficient combustion obtained under the conditions of hand firing.

The principal dimensions and data are given in the following table:

General Data	
Gage.....	4 ft. 8 1/2 in.
Service.....	Freight
Fuel.....	Bit. coal
Tractive effort.....	51,400 lb.
Weight in working order.....	343,000 lb.
Weight on drivers.....	234,600 lb.

Ratings	
Kind.....	Piston
Diameter.....	14 in.
Greatest travel.....	7 in.
Outside lap.....	1 in.
Inside clearance.....	0 in.
Lead.....	3/4 in.
Wheels	
Driving, diameter over tires.....	69 in.
Driving, thickness of tires.....	3 3/4 in.
Driving journals, main, diameter and length.....	11 1/2 in. by 18 in.
Driving journals, others, diameter and length.....	11 in. by 13 in.
Engine truck wheels, diameter.....	33 in.

H wheels (Continued)

Engine truck, journals.....	6½ in. by 12 in.
Trailing truck wheels, diameter.....	45 in.
Trailing truck, journals.....	9 in. by 14 in.

Boiler

Style.....	Conical
Working pressure.....	190 lb. per sq. in.
Outside diameter of first ring.....	81 7/16 in.
Firebox, length and width.....	114¼ in. by 84¼ in.
Firebox plates, thickness.....	Crown, sides and back, ¾ in.; tube, ½ in.
Firebox, water space.....	5 in.
Tubes, number and outside diameter.....	216—2½ in.
Flues, number and outside diameter.....	45—5½ in.
Tubes and flues, length.....	21 ft. 6 in.
Heating surface, tubes.....	4,110 sq. ft.

Heating surface, firebox, including arch tubes.....	320 sq. ft.
Heating surface, total.....	4,430 sq. ft.
Superheater heating surface.....	1,212 sq. ft.
Equivalent heating surface.....	6,248 sq. ft.
Grate area.....	668 sq. ft.

Tender

Tank.....	Water bottom
Frame.....	Cast steel
Weight.....	166,500 lb.
Wheels, diameter.....	36 in.
Journals, diameter and length.....	5½ in. by 10 in.
Water capacity.....	8,000 gal.
Coal capacity.....	14 tons

* Equivalent heating surface = total evaporative heating surface ÷ 1.5 times the superheating surface.

President Wilson Takes Over Railroads

Wm. G. McAdoo, Secretary of Treasury, Becomes Director General of Railroads But Retains Present Office

WASHINGTON, D. C., December 26, 1917 (By wire).

PRESIDENT WILSON on Wednesday evening issued a proclamation taking over the possession and operation of the railways of the United States under the authority of the act of August 29, 1916, effective at noon Friday, December 28, and appointing William G. McAdoo, secretary of the treasury, as Director General of Railroads. He also announced that he would recommend to Congress that the roads be guaranteed a net income equal in each case to the average of three years preceding June 30, 1917.

"I have exercised the powers over the transportation system of the country which were granted me by the act of Congress of last August because it has become imperatively necessary for me to do so. This is a war of resources no less than of men, perhaps even more than of men, and it is necessary for the complete mobilization of our resources that the transportation systems of the country should be organized and employed under a single authority and a simplified method of co-ordination which have not proved possible under private management and control. The committee of railway executives who have been co-operating with the government in this all-important matter have done the utmost that it was possible for them to do; have done it with patriotic zeal and with great ability, but there were difficulties that they could neither escape nor neutralize. Complete unity of administration in the present circumstances involves upon occasion and at many points a serious dislocation of earnings, and the committee was, of course, without power or authority to rearrange charges or effect proper compensations and adjustment of earnings. Several roads which were willingly and with admirable public spirit accepting the orders of the committee have already suffered from these circumstances and should not be required to suffer further. In mere fairness to them the full authority of the government must be substituted. The government itself will thereby gain an immense increase of efficiency in the conduct of the war and of the innumerable activities upon which its successful conduct depends.

"The public interest must be first served and, in addition, the financial interests of the government and the financial interests of the railways must be brought under a common direction. The financial operations of the railways need not then interfere with the borrowings of the government and they themselves can be conducted to a greater advantage. Investors in railway securities may rest assured that their rights and interest will be as scrupulously looked after by the government as they could be by the directors of the several railway systems.

"Immediately upon the assembling of Congress I shall recommend that these definite guarantees be given:

"First, of course, that the railway properties will be main-

tained during the period of federal control in as good repair and as complete equipment as when taken over by the government, and second that the railroads shall receive a net operating income equal in each case to the average net income of the three years preceding June 30, 1917; and I am entirely confident that the Congress will be disposed in this case, as in others, to see that justice is done and full security assured to the owners and creditors of the great systems which the government must now use under its own direction or else suffer serious embarrassment.

"The Secretary of War and I are agreed that, all the circumstances being taken into consideration, the best results can be obtained under the immediate executive direction of the Honorable William G. McAdoo, whose practical experience peculiarly fits him for the service and whose authority as Secretary of the Treasury will enable him to co-ordinate as no other man could the many financial interests which will be involved and which might, unless systematically directed, suffer very embarrassing entanglements.

"The government of the United States is the only great government now engaged in the war which has not already assumed control of this sort.

"It was thought to be in the spirit of American institutions to attempt to do everything that was necessary through private management and if zeal and ability and patriotic motive could have accomplished the necessary unification of the administration, it certainly would have been accomplished, but no zeal or ability could overcome insuperable obstacles and I have deemed it my duty to recognize that fact in all candor now that it is demonstrated and to use without reserve the great authority reposed in me. A great national necessity dictated the action, and I was, therefore, not at liberty to abstain from it."

The proclamation directs that the possession, control, operation and utilization of the transportation systems shall be exercised by and through William G. McAdoo, who is appointed and designated Director General of Railroads. And the "said director may perform the duties imposed upon him, so long and to such extent as he shall determine, through the boards of directors, receivers, officers and employees of said systems of transportation. Until and except so far as said director shall from time to time by general or special orders otherwise provide, the boards of directors, receivers, officers and employees of the various transportation systems shall continue the operation thereof in the usual and ordinary course of the business of common carriers, in the names of their respective companies.

"Until and except so far as said director shall from time to time otherwise by general or special orders determine, such system of transportation shall remain subject to all

existing statutes and orders of the Interstate Commerce Commission and to all statutes and orders of regulating commissions of the various states in which said systems or any part thereof may be situated. But any orders general or special, hereafter made by said director, shall have paramount authority and be obeyed as such."

The order does not affect the possession, operation and control of street electric passenger railways, including railways commonly called interurbans, whether such railways be or be not owned or controlled by such railroad companies or systems. By subsequent order and proclamation, if any, when it shall be found necessary or desirable, possession, control, or operation may be taken of all or any part of such street railway systems, including subways and tunnels, and by subsequent order and proclamation possession, control and operation in whole or in part may also be relinquished to the owners thereof of any part of the railroad systems or rail and water systems, possession and control of which are hereby assumed.

It is further provided that "the director shall as soon as may be after having assumed such possession and control enter upon negotiations with the several companies looking to agreements for just and reasonable compensation for the possession, use and control of their respective properties on the basis of an annual guaranteed compensation, above accruing depreciation and maintenance of their properties, equivalent, as nearly as may be, to the average of the net operating income thereof for the three-year period ending June 30, 1917, the results of such negotiations to be reported to me for such action as may be appropriate and lawful.

"But nothing herein contained, expressed or implied or hereafter done or suffered hereunder, shall be deemed in any way to impair the rights of the stockholders, bondholders, creditors and other persons having interests in said systems of transportation or in the profits thereof, to receive just and adequate compensation for the use and control and operation of their property hereby assumed.

"Regular dividends hitherto declared, and maturing interest upon bonds, debentures and other obligations, may be paid in due course, and such regular dividends and interest may continue to be paid until and unless the said director shall from time to time otherwise by general or special orders determine; and, subject to the approval of the director, the various carriers may agree upon and arrange for the renewal and extension of maturing obligations.

"Except with the prior written assent of said director, no attachment by mesne process or on execution shall be levied on or against any of the property used by any of said transportation systems in the conduct of their business as common carriers, but suits may be brought by and against said carriers and judgments rendered as hitherto until and except so far as said director may, by general or special orders, otherwise determine.

"From and after twelve o'clock on said twenty-eighth day of December, 1917, all transportation systems included in this order and proclamation shall conclusively be deemed within the possession and control of said director without further act or notice. But for the purpose of accounting said possession and control shall date from twelve o'clock midnight on December 31, 1917."

In accordance with the provision of the law possession of the roads is taken in the name of the secretary of war, the proclamation reciting that it is necessary in the national defense. The order applies to "each and every system of transportation and the appurtenances thereof located wholly or in part within the boundaries of the continental United States and consisting of railroads and owned or controlled systems of coastwise and inland transportation engaged in general transportation, whether operated by steam or electric power, including also terminals, terminal companies and terminal associations, sleeping and parlor cars, private cars and private

car lines, elevators, warehouses, telegraph and telephone lines, and all other equipment and appurtenances, commonly used upon or operated as a part of such rail or combined rail and water systems of transportation—to the end such systems of transportation be utilized for the transfer and transportation of troops, war material and equipment to the exclusion so far as may be necessary of all other traffic thereon; and that so far as such exclusive use be not necessary or desirable, such system of transportation be operated and utilized in the performance of such other services as the national interest may require and of the usual and ordinary business and duties of common carriers."

The President in his statement indicates that Secretary McAdoo will retain his present office in addition to his new duties. The net income of the railways of the United States for the past three years, which the President says he will recommend be guaranteed to them, according to the latest annual report of the Interstate Commerce Commission was as follows:

In percentages of the book cost of road and equipment: 1915, 4.09 per cent; 1916, 5.8 per cent; 1917, 6.5 per cent (estimated).

REPORT ON LARMOND COLLISION

The Interstate Commerce Commission has issued a report, dated November 6, and signed by H. W. Belnap, chief of the Bureau of Safety, giving the nature and causes of the collision on the Southern Railway at Larmond, Va., near Orange, on October 21, when an engineman and a fireman were killed and six passengers, five postal clerks and 1 employee were injured. Northbound local passenger train No. 16, having taken the side track to wait for northbound passenger No. 42, started out of the siding immediately after the passage of the through train and was run into at the side by a second through passenger train, No. 38. The engine of No. 38 was overturned and its engineman and fireman were fatally injured. The line was straight and the weather was clear; and the inspector concludes that if any member of the crew of train No. 16 had looked back immediately before starting out of the side track, the collision might have been avoided.

The line is equipped with automatic block signals. There are no indicators at the switches but the rule requires that after the switch is set for a train to leave the siding, two minutes shall be allowed to elapse before moving the train forward. The inspector finds that the men in charge of No. 16 did not wait the two minutes; and No. 38 therefore, had entered the block section in which the siding is situated while the automatic signal (No. 834) indicated either stop or caution. The engineman, who died a few hours afterwards, said that it was "white"; but all the evidence contradicts this. By comparing the times and speeds of train 42 and train 38, the inspector is convinced that the testimony concerning the length of time waited by No. 16 is not true. The inspector cannot decide with certainty whether signal 834, when No. 38 approached it, was at stop or at caution. If train No. 42 had not gone far enough to clear the second block, and if therefore signal 834 indicated caution, the engineman, says the inspector, cannot be blamed; for under the rule, he would treat the indication only as a distant indication; an indication directing him to be prepared to stop at the next signal, but not to come under control at once. The engineman of No. 38 had had a clear record as engineman for 37 years, and all the employees involved were experienced men, with good records; but the inspector does not accept the testimony of the men in charge of No. 16 to the effect that they were on the siding four minutes or longer. The conclusion is positive that the turning of the switch, which would set signal 834 at stop, was not done until the engine of No. 38 had passed that signal; and as soon as it was turned No. 16 started out.

CORRELATING THE MILITIA AND THE RAILWAYS

By Brigadier-General Charles H. Sherrill
Adjutant General, State of New York.

Thanks to the preparation for war which is now going forward under the lead of the administration in Washington, energetic steps are being taken to send to the fighting front in Europe our regular army, our federalized national guard army, and all those who are taken into the military service through the operation of the federal draft law. It is, of course, difficult to conjecture how many months it will take to transfer all these men to the other side of the water, but the time is coming when that task will have been completed. When it is completed, and all the fighting men have been sent out of the country, how will there be safeguarded the lives of those who remain in the United States, and the property, including manufacturing and the munition plants which will then be working to their full capacity? This is a problem which deserves the best thought of the best minds in all parts of the country.

In New York State we have done our best to go forward to meet the problem without waiting for it to arrive, because preparedness in advance is the best form of preparedness. Believing in the militia we have used them as a basis upon which to build our structure of defense, and in that building we have sought the advice of the railways. In the spring of 1916 the "militia idea" of this country blossomed out into preparedness parades in 92 cities, with the impressive total of 2,850,000 marchers, led by the New York City parade of 140,139. Properly encouraged this same "militia idea" can, if wisely correlated with the railways, yield even greater results for the safeguarding of our land.

The New York plan of handling the guarding of our country, after our regular army, national guard army, and conscript army have all gone abroad, is that the two great factors available for that defense are the railways of the country, plus the militia, and that neither of those factors is anything like so valuable considered separately as the two together can be made to be if intelligently correlated. This combination of these two factors was described in detail by me, when, with the approval of the war department, I counselled recently in Washington with the Railway War Board upon the problem of railway guarding.

The reorganization of the New York Guard has been mapped out after careful study of the possibilities of railway transportation in this state, and after consultation with the best available railroad authorities. A large portion of any success which the New York Guard will have in the discharge of its duties will be due to the valuable co-operation which we already have received and are continuously receiving from the patriotic men who are at the head of the railway systems which form the arteries of communication of this state. We believe that too much stress cannot be laid upon the value to this country of the correlated efforts of the railways and the militia. Both of them deserve increased consideration by the public and by the government.

In the duty now being conducted by volunteer units from the New York Guard of protecting 95 miles of New York City's aqueduct, 420 miles of New York State's canals, and many important railway bridges and public buildings, we believe that our local militia, acquainted as they are with the geography of and the conditions surrounding the points they are guarding, can perform that work more efficiently than troops lacking that special information. We believe that the new battalion of the New York Guard, whose units stretch out along the southerly shore of Long Island, made up as they are from men who know well every inch of that coast line, can perform coast guard duty there more efficiently than could troops who are strangers to that coast. The efficiency of those local guards is more than doubled by their

being posted according to a plan based upon careful study of the possibilities of rapid interchange or strengthening of their units by means of railway transportation.

By instruction of Governor Whitman, there has been recruited into the New York Guard twelve thousand men, who are now receiving a full equipment of uniforms and have already received their rifles and an adequate supply of ball cartridges. All of these military supplies have been paid for by the State of New York.

The old policy of having the units of the Guard confined to a few localities in the state has been reversed, and since September first we have placed New York Guard units in over a hundred localities, which is double the number formerly covered by the armed forces of this state. There are now units in almost every county of the state, so that our military protection is more widely distributed than ever before. The reorganization of the Guard has been published in General Orders No. 58, which shows where every unit is located and also its brigade and the names of the regimental commanders.

All of these brigade and regimental commanding officers were trained in the New York National Guard, and with but one exception, have served with the units to which they are now assigned. In their selection no political influence has been considered, and no friendships observed. No officers are commissioned except upon the recommendation of their commanding officers, and approved by their brigade headquarters. We have determined that there shall be preserved under officers of their own training and in their own armories, the fine traditions of each of our splendid National Guard units which entered the Federal service and lost their old numbering.

It is but natural that a governor like Charles S. Whitman, who is a proved friend of the budget system of government, and who was so farsighted as to insist on putting through in the face of much public misunderstanding the New York state military census, now approved and copied on all sides, and being utilized by the American and the British governments, should insist upon rigid economy in the matter of military expenditures. To carry out that idea, I have arranged that all military supplies in this state shall be purchased through my Quartermaster General, Major Michael Friedsam, who as president of B. Altman & Company has had a wide business experience in the matter of purchases of supplies in large quantities. This system of purchasing not only guarantees that New York secures the best possible value for its money, but also that the state's funds are being honestly and intelligently disbursed.

Under the able leadership of E. G. Miner, of Rochester, there has been organized in the Adjutant General's office, in Albany, a Division of Chambers of Commerce, and all over this state we are utilizing those efficient non-partisan combinations of our best business minds to aid in each and every administrative problem which confronts my department.

The New York Chamber of Commerce has already aided us by its careful examination of Camp Whitman and Camp Peekskill, and so has the Citizens' Preparedness Association with its careful scrutiny of the arsenal, and similar valuable results will soon follow in other localities.

The war disbursements of New York State are so great, and the purposes of their expenditure so important that we need the best business minds to advise us thereon, and that advice is being accorded to us in most generous measure.

Based on the sure foundation of skillful non-partisan business supervision of the financial administration of our military department, and forearmed with a carefully studied plan of correlating the militia with the railways, New York State should possess a reasonable confidence in conformity with its problems of safeguarding the lives and property of its citizens.

Monthly Meeting of Western Railway Club

An Informal Address on Co-operation by A. M. Schoyer
and a Paper on the Business Box Car by W. J. Bohan

TWO addresses were delivered at the meeting of the Western Railway Club which took place at the Hotel Sherman, Chicago, on December 17. An informal talk was given by A. M. Schoyer, resident vice-president of the Pennsylvania Lines, following which the paper of the evening was read by W. J. Bohan, mechanical engineer of the Northern Pacific.

CO-OPERATION

Mr. Schoyer spoke in part as follows: The railroads have come to the point where they realize that if they are to have strength they must have union. They are now working together and while there is more business than ever before, there is less competition. There is still some competition on the western railroads, but there is very little between those in the East. On our own road we have turned all our traffic solicitors over to other work; some are in the transportation department, some in the accounting department, and others are serving on embargo committees.

The railroads have realized that they must get together to handle the present enormous business. The United States will spend in the next 126 weeks as many billions of dollars as it spent in the 126 years preceding. All of us will be called on to handle more government business in the next two years than in the 126 years before. Consider that in addition to this, we are supplying the armies of Europe and the people of this continent and it becomes evident that the railroads must combine their resources. By joining their forces and co-operating, by using the locomotives and all other facilities together they will get more business over the rails than was ever considered possible.

If the men now running the railroads cannot meet the railroad problem, no one in the world can do it. I know that we have the best railroad men in the world and lawyers, administrators, or college professors could not get 25 per cent as much traffic over the roads as the men now operating them can. For that reason we must co-operate; we must play the game together. Any railroad man at his regular work is doing more for the United States now than he could in any other place. We are needed here, for if the railroads can't go on, we can't win the war. In my judgment the duty of every man in railroad service is to press with might and main to make the railroads more efficient than ever before.

Any improper spirit of rivalry should be laid aside at this time. The carriers' function of keeping the government supplied is so tremendous they can't for a moment think of the interests of the individual roads as opposed to the interests of the nation. We must even subordinate the interest of the owners of the railroads to the interests of the country at large.

The western railroads are furnishing 102 locomotives to the eastern roads. These engines cannot well be spared from the western roads, but they have been turned over to the eastern lines where the need is greatest. This has been done because it is realized that that section of the country needs transportation and can only get it if the eastern roads have the locomotives.

There is great need of co-operation between employer and employee at this time, but there is little prospect of it unless the men come to realize that the United States must have its transportation lines in the best of condition to win the war. If we could make the laboring man realize this, we would get better transportation. The laboring men are organized and are now using the power of the unions with more force

than ever before. They have an opportunity for doing loyal service to the country by making the transportation system operate at its maximum efficiency. If labor conditions continue to grow worse, I do not know how we will get men enough to run the railroads. Whether we have government control or government operation, the railroad men must continue to operate the roads. Let us all remember that our part is to do our best for our country in the place where we have been put.

THE BUSINESS BOX CAR

By W. J. Bohan,

Mechanical Engineer, Northern Pacific

It is my intention to offer a few remarks on the business of a box car and the relation of its construction thereto. I am taking the box car, as that type appears most frequently in interchange, and is probably receiving the greatest attention at the present time. An impression of the importance of box cars as they affect dividends can be gained from the following facts:

A total of 261,100 box cars were owned and operated by eight leading western and northwestern railroads during the last year, or an average per road of approximately 32,600. The total number of box cars represents 50.7 per cent of the total freight cars owned by these roads. These box cars may fairly be said to represent an original investment of \$210,000,000.

The average total cost of repairs per road per year for a four-year period for all classes of cars was \$3,481,000. The average cost of repairs per car per year was \$64. The minimum cost per car per year for one of the roads was \$41. The maximum cost per car per year was \$110, a difference between minimum and maximum cost per car per year of \$69, or \$5 more than the average cost of repairs per car per year for all the roads mentioned.

The character of transportation on each of these roads is the same and the ratio of the number of box cars to the total number of freight cars of all classes is very nearly the same. It is fair to assume for the purpose of this paper that the above repair cost ratios for the different roads would obtain for box cars.

The claims paid for losses due to grain leakage by a large grain carrying line of the same group of roads for four years ending in 1917, averaged \$80,000 per year, grain being carried in both owned and foreign cars. The average damage claims paid per year on account of defective equipment on all commodities other than grain for the same period was \$17,000.

A stockholder of an inquiring turn of mind, or the president of one of these railroads, in view of the high loss and damage costs and wide difference in repair figures, would be justified in asking, "What is the matter?" Several things are the matter, and one of them is undoubtedly lack of business balance in car construction—box car construction—that being the type of car under consideration.

IMPROVED BOX CAR DESIGN NEEDED

For years mental and physical energy have been spent on box car design by the best and most loyal of men both technical and practical, and a generally satisfactory box car is not yet with us.

Have we kept it back by a flux of figures on stresses and strains lacking the leaven of sound engineering judgment?

Have we delayed its coming by building upon too narrow conceptions of the problem? Have we co-operated with each other sufficiently in treating a large subject in a large way, by exerting our energies toward a broad and careful analysis of the subject, with a full realization that box cars are business agents of the railroads that own them, and that their dividend earning capacity depends upon their commercial efficiency as well as upon their mechanical details, and have we realized that the two qualifications are correlated? The fact that we haven't the generally satisfactory box car indicates at least that the progress of its development has been slow. The time has arrived when we must develop an efficient box car in its fullest sense. The unusual volume of business, the shortage of equipment, the scarcity of labor and material with the constantly upward trend in the prices of both, demand it. What have we got to offer in the way of a business box car?

The business box car must be free from leakage of lading, it must be weather-proof and practically fire-proof, it must have a so-called non-sweating interior free from projections and pockets, it must have properly dimensioned door openings and substantial free positive functioning doors and fastenings, and be so constructed as to lend itself to diversified lading with the incidental supplementary doors, blocking, etc. In short, it must be a car popular with the shipper—a dividend earning unit having a maximum demand.

It must, in addition to these qualities, have a minimum light weight, a maximum utility and carrying capacity per unit of weight, reasonable first cost, and freedom from mechanical defects. Two principal elements enter into the design and construction of such a car. First, accurate technical engineering information, and second sound, practical business judgment based upon experience, the latter largely predominating for the reason that evidence is lacking that anyone ever reduced the things that happen to a box car to conclusive figures.

In a recent article in one of the railway magazines a statement was made that in train service the car body has three movements, all of which absorb a part of the force applied at the couplers. This is true as far as it goes, and if this were all, figuring would be comparatively easy. It, however, stops where the real trouble begins. The fact of the matter is that the box car is subject not only to these three forces, but the resultant of their combined action and many others of such varying direction, intensity and rapidity, of occurrence that their accurate mathematical determination is out of the question. Among these forces may be mentioned those due to poorly balanced design, unevenness of track, curvature, centrifugal force, train handling, draft action, irregular lading, shifting of lading, atmospheric conditions, etc.

Briefly, all of these forces combine in what may be called "team work" against the life of the box car. Close observation and experience with a large number of different types of box cars indicates that the general and greatest result of this team work manifests itself in twisting the car. Such being the case, team work in an opposite direction by the various members of the car must be the natural antidote.

I believe the most economically efficient box car to be one in which every detail, even the grab iron, is made to do its fair share in assisting the natural functions of the car and resisting the stress and abuse to which it is exposed. The body of such a car should not be built around any one member, but all of its members should form a unit having maximum inherent strength and resilience and acting as a unit in dissipating all reasonable strain action. It should have the fewest possible primary and special parts in that joints, gussets, rivets, bolts and fastenings which work and wear to the detriment of the car, increase its cost of upkeep and loss of time on repair tracks, may be reduced to a minimum.

GENERAL SPECIFICATIONS

A general specification for a car that would meet the requirements outlined would be briefly as follows:

The weight for a 40-ft. 40-ton box car should be between 45 and 50 per cent of the stenciled capacity. I should say it should not exceed 48 per cent. This weight can be obtained without sacrifice of strength.

The body should be steel framed throughout, preferably of pressed steel of resilient quality. The underframe, sides, ends and roof should be diagonally braced throughout. There is no question about the efficiency of diagonal bracing. Its value has been many times demonstrated in the reclamation of thousands of old cars. As the diagonal bracing of the entire construction will distribute the strains due to the live load and shocks to all members of the car, the fish belly type of center construction is not necessary. Ten-inch center sills of ordinary cross section are sufficient.

The side and end posts and braces, at the points of attachment with sills and plates, underframe bracing at the points of attachment with center and side sills, and roof bracing at the points of attachment with ridge pole and plates, should be directly connected, that is, the usual construction using gusset plates or other secondary members should be eliminated as the strength and efficiency of the car can be materially increased by so doing, and unnecessary parts eliminated. Autogenous welding may be used to material advantage in such a construction.

The diagonal underframe bracing at the ends should be securely tied to both the center and end sills at their junction, and extend continuously around the ends of the body bolster the cross ties, with alternate connections to the center and side sills. The same general construction may be followed in the roof for the attachments of the diagonal bracing and plates, ridge pole and door carlines. At the door openings the underframe should be substantially reinforced by supplementary diagonal bracing. The plate may be similarly reinforced above the door, or the door track constructed to form the reinforcement. The roof reinforcement at the door openings may be made by the use of carlines at the door posts. The end construction with its attachment to end sills and plates should be similar to the side construction.

The corner posts should be formed by directly connecting the end side post and side end post members throughout their entire length. This will not only tie the car together securely but it materially assists in forming an integral construction. The corners may be further reinforced by continuous corner and end grab irons. The side and end sheathing should be constructed of two sections of sheet steel, their junction reinforced by plates, and all securely riveted together forming side and end girths, the girth reinforcing plate extending continuously from side door post to side door post around the end of the car. The end and side lining should be of matched lumber, the sides $\frac{3}{4}$ in. or $1\frac{1}{2}$ in. thick, the ends $1\frac{1}{2}$ in. thick, the lining extending from floor to plates. The floor may be of the usual $1\frac{1}{2}$ in. matched stock secured to furring strips on the underframe, using standard grain strips at the intersections of the floor and the sheathing.

The roof should be of the circular type and may be constructed of two sheets of No. 16 steel running lengthwise of the car, with a joint at the ridge pole, the two roof sheets being securely riveted between the ridge-pole and a weather proof ridge-pole cap. The roof sheets should also be securely riveted to the diagonal braces, end and side plates, thus forming an integral member of the car capable of sustaining its share of the load. It is necessary that the inside of the roof be what is commonly called "non-sweating." This can be taken care of by the application of a heavy coat of ground cork and red lead or mineral paint applied to the exposed metal surfaces.

The door should be of steel, framed and sheathed similar to the body of the car, and mounted with weather-proof shields at the posts and plates.

The truck should, like the body, have as few parts as possible and be preferably of the cast steel type. Particular attention should be given the brake beam mounting to insure even brake shoe wear and proper alignment of levers and rods. All of these points are of extreme importance not only in that they may perform their special functions properly, but that irregular transmission of stresses to the car itself be avoided as far as possible. Brake equipment of standard makes is quite satisfactory. Special attention, usually lacking, to secure proper application and alignment of parts, is absolutely necessary to obtain safe and efficient results.

The draft gear should be of the friction type having a minimum recoil action, which should be just sufficient to readjust the parts in release. The travel should be approximately four inches. The shock dissipating capacity should be the maximum obtainable with prescribed travel and standard clearance conditions. The draft lug fastenings should approach strength sufficient to resist the maximum shocks regardless of draft gear capacity.

The holes in the framing should be die punched to templates. All rivets and bolts should be of the best quality obtainable and of full cross section. Bolts should have properly proportioned heads and clean cut and accurate threads to provide for wrench fit of nuts. Nuts should also be of the best quality and manufacture. The application of both rivets and bolts should be made without drifting, rivets having full and concentric heads and driven at the proper temperature.

Double nuts, lock nuts, cotters and split keys where used should be given special attention. I consider a good design of nut lock superior to a cotter or split key on account of the extreme difficulty in getting proper application of cotters or split keys. No one little thing is a source of more trouble on a car than loose nuts.

Too much stress cannot be placed upon the importance of more careful practical engineering study of both general and detail design to secure a well balanced, resilient car unit. Some manufacturers have done a great deal of excellent work in this direction on underframes, but have not in my opinion extended the resilient features far enough, as there is no reason why it should not extend to the entire superstructure. Particular attention should also be given to the selection and assembly of the best material obtainable.

In conclusion, it must always be borne in mind that the most efficient business box car is one so constructed and assembled that it will afford a maximum resistance to the development of chronic conditions arising from general and not maximum service stress. Such a car, reasonably maintained, will have the physical strength to take care of reasonable maximum stresses and at the same time represent a minimum first cost and up-keep, and be commercially efficient.

DISCUSSION

In the discussion the necessity for a greater side clearance for couplers to facilitate coupling on curves and to eliminate unnecessary stresses on striking castings was brought out. Several members spoke on side bearing location and clearance and brought out the fact that there is little agreement regarding the most desirable practice. In discussing the efficiency of diagonal bracing, one of the members told of some 50-ft. steel automobile cars which were diagonally braced and figured in numerous derailments on curves. The side bearing location and clearance were changed but the trouble was not overcome until the diagonal bracing was removed. The opinion was expressed that extra weight is often necessary in cars as it reduces maintenance. Since corrosion weakens the cars the parts must be designed

with excess strength. It was pointed out that the cost of maintenance of freight cars varies widely with the character of the service, the amount of switching and the topography of the road on which they are operated.

POOLING THE FACILITIES OF THE EASTERN RAILROADS

The eastern railroads' car pool, authorized on December 5 by the General Operating Committee of the Eastern Railroads, with F. G. Minnick as chairman with office at Pittsburgh, has issued General Order No. 1 containing regulations to govern the pool. The purpose is to pool all railroad coal-carrying cars upon the railroads coming under the jurisdiction of the committee, to the end that maximum efficiency may obtain in the handling of coal car equipment and the various railroads have been asked to instruct their transportation officers to give their full support and earnest co-operation in carrying out the work.

The organization consists of the manager and office and field assistants under the jurisdiction of the General Operating Committee. The expenses are to be apportioned in accordance with direction of the committee. The cars subject to the pool regulations include all open top cars owned or otherwise controlled by the eastern railroads or private cars at home on such railroads, if authority is secured to include them, except flat cars and coke cars and assigned coke cars. The basis for the apportionment of cars is to be the current situation represented by the percentage of cars furnished or available to cars ordered and actual requirements for the transportation of designated commodities, provided the number of pooled cars on each member line currently is equal to the average number of cars now controlled by the pool that were on each principal line daily during the period of 90 days immediately prior to December 1, 1917; further provided that such percentage does not exceed the actual requirements of each member. Cars which belong to a non-member line consigned to a particular mine for loading railroad fuel coal are not to be counted in the daily report of cars furnished or available and the mine rating must be reduced accordingly. Daily telegraphic reports are to be furnished by each member line to the manager giving information as to the number of cars required for the loading of coal, limestone, ore, iron and steel, and miscellaneous loading, also the number and percentage of cars furnished or available for each of these commodities. A weekly report is also to be furnished on form C S 11 and a monthly location statement, showing all equipment on line by classes. The manager will maintain a permanent record of daily telegraphic reports.

The regulations provide: Self-clearing steel hopper cars and single, double or triple hopper bottom steel or wood gondola cars originally built and intended for the handling of coal and limestone or other similar products must not be utilized for the handling of shipments of iron or steel or other similar products except that they may be loaded in the direction of coal mines, limestone quarries or ore docks in order to avoid empty mileage. Gondola cars having flat or drop bottoms, tight or drop ends, measuring 36 ft. to 46 ft. in length, which were originally built for the handling of iron and steel, must not be placed at coal mines for coal loading except when the lading will be destined to points in iron and steel producing territory in order to avoid empty mileage. Pooled equipment must, as far as practicable, be placed for loading to destinations on railroads which are members of the pool to the end that such equipment may be, as far as possible, governed by pool regulations.

It is the obligation of the Commission on Car Service to issue such instructions and enforce their provisions to railroads coming under their jurisdiction who are not members of the pool as will insure the immediate return, loaded or

empty, as soon as released from the original load, to railroads who are members of the pool, of all pool equipment loaded to points beyond the jurisdiction of the pool.

Railroads must equalize the interchange of pooled equipment currently. When the equalizing of pooled equipment is not accomplished by members of the pool it must be adjusted by the manager at suitable periods. The manager is to order the apportionment of cars among member lines based upon the situation as indicated by reports and records of cars required and cars available. The distribution of equipment by the manager among member railroads must be accomplished with a minimum empty movement of cars in all cases.

The pool is effective as of December 5, 1917, and will continue during the period in which extraordinary operating and traffic conditions obtain on account of the war.

Under date of December 17, the general operating committee issued a circular urging all roads, in order to assist in making the car pool immediately effective and to relieve the manager during the period of its installation as much as possible until the organization and working machinery can be perfected, to demonstrate co-operation by individually carrying out the regulation regarding the equalization of the interchange of pooled equipment currently with their connections, and also, so far as possible, to keep cars on the home road. It was stated that there are numerous interchange conditions where in the ordinary course of business cars can be sent back to the home road with no material increase in switching and thereby be kept in the hands of the owners, not only facilitating the distribution, but assisting in their maintenance. It was felt that no hard and fast rules can be formulated to cover this point and the co-operative spirit of roads concerned is therefore relied upon.

The sub-committee on military transportation accounting of the Railroads' War Board has created an accounting organization to confer and co-operate with the General Operating Committee in respect to all matters in which the revenues of the railroads are involved. The organization consists of an accountant, J. E. Merion, assistant comptroller of the Pennsylvania Lines, with office at Pittsburgh, and field accountants appointed by him to be stationed at the headquarters of, and to co-operate with, the chairmen of the several sub-committees of the general committee, together with field accountants appointed at or transferred to terminals which may be used in common by two or more railroads, as may be directed by the General Operating Committee for the purpose of directing and aiding in the keeping of proper records of the use of such terminals. The accountant is a representative of the sub-committee on accounting, to which he will report. He will also, however, keep in close touch with the operating committee to the end that maximum results may be obtained through practical co-operation. The accounting committee assumed that a large proportion of the traffic will move via its way-billed route and that it will be only necessary to provide machinery to take care of freight diverted. Its conclusion was that this could be best done by the use of rubber stamps properly worded, the impress of which is to be placed upon each way-bill at each junction or interchange point at and through which diverted freight moves. The stamps are to be applied by the agent or other representative of the railroad first receiving the freight from its way-billed route and by the agent or other representative at each succeeding junction or interchange point in the diverted route. The stamp thus indicates the route traveled by diverted freight and forms a guide in the apportionment of revenues by the accounting office of the destination railroad.

As to common use of terminals, it was assumed that such use would be under varying conditions, including in some cases only fixed facilities and in other cases both power and facilities. Mr. Merion is to keep in touch with the committee on this question and to produce suggestions for each condition as it arises.

As to detours, it is the understanding that compensation for ordinary detouring will be settled for under the rates and rules of the American Railway Association, but there may be extraordinary detours, the compensation for which will have to be specifically arranged.

Mr. Merion has issued a circular giving instructions as to the accounting methods to be followed in connection with diverted freight, to the end that accounting officers of destination lines may apportion the revenue to the line performing the service. These regulations provide in detail for the use of the diverted freight stamp referred to.

The General Operating Committee has also issued a circular on the same subject, ordering that a revenue way-bill must accompany each and every car of freight diverted from its way-bill route. In event of accident or any unforeseen emergency, if a car diverted from its way-bill route should be delivered at point of interchange on a card way-bill the delivering road is instructed to issue therefor an astray freight way-bill under which the car will be delivered to the diverted railroad and travel to its final destination in lieu of a card way-bill. General instructions are also given for the use of the rubber stamps.

C. R. Gray, president of the Western Maryland, has been elected vice-chairman of the General Operating Committee to act for the chairman in his absence. Albert S. Ingalls, general manager of the New York Central, has been appointed a member of the committee to succeed P. E. Crowley. J. J. Bernet, president and general manager of the New York, Chicago & St. Louis, has been appointed chairman of the Cleveland sub-committee, vice A. S. Ingalls. R. E. McCarty, resident vice-president of the Pennsylvania Lines West, has been appointed chairman of the Pittsburgh sub-committee, succeeding D. F. Crawford.

On December 18 the General Operating Committee issued a modification of its embargoes on carload freight within the Pittsburgh switching limits to permit the movement of fuel, oil and tank cars from refineries located within the switching limits directly to points of consumption within the same district.

Having been informed of the organization of the Coal Shippers' Terminal Pool Association, for the expeditious handling and distribution of coal at Cleveland, Toledo, Akron, Columbus, Detroit, Canton and Youngstown and other points to be determined later, the General Operating Committee has requested the various railroads to co-operate heartily and thoroughly with the organization. Primary pools are to be put in operation as quickly as possible at scales for the purpose of eliminating switching and relieving intermediate terminals.

Some of the sub-committees of the General Operating Committee have found it advantageous for railroads in their territories to exchange locally repair parts and materials for repair of foreign railroad cars, the railroad having such cars for repair requisitioning and securing necessary repair parts for adjacent or connecting lines on which a surplus of such material exists. The committee has issued a circular expressing its desire that this practice be carried out wherever possible or expedient to do so.

Arrangements have been made by the Railroads' War Board for the lease from the government of 100 U. S. A. locomotives, ordered by the War Department for service in France, to eastern railroads in this country for the purpose of enabling them to reduce congestion. It was noted in last week's issue that 30 of these locomotives built by the Baldwin Locomotive Works had been delivered to four eastern lines. Effort is being made to obtain permission to lease 50 more. It is probable that some of the locomotives on order for the Russian government will also be devoted to the use of American roads. Although no definite announcement has yet been made, it is understood that further shipments of railway supplies to Russia have been held up on account of the political situation in that country.

Annual Report of the Bureau of Safety

Decrease in Defective Cars Found; Suggestions for Improvement Resulting from Accident Investigations

H. W. BELNAP, chief of the Bureau of Safety of the Interstate Commerce Commission, has submitted his annual report to the commission, presenting a series of statistical tables showing the results of the inspection of safety appliances on railroad equipment for the fiscal year ended June 30, 1917, and also a review of the year's work. An abstract of the report follows:

Table No. 1 shows the number of cars and locomotives inspected, the number found defective, the percentage defective, the number of defects, number per thousand cars, etc.

Table No. 2 presents the number of defects reported for each of the 16 classifications on individual railroads on which 500 or more cars were inspected. Table No. 3 is a report of terminal or standing tests of power brakes.

Table No. 4 contains statistical summaries for the past five years with comparisons of the condition of safety appliance maintenance on the part of certain representative railroads. The results of inspections of the years ended June 30, 1914, 1915, 1916, and 1917 are shown as follows:

	1914	1915	1916	1917
Freight cars inspected.....	790,822	1,000,210	908,566	1,100,164
Per cent defective.....	5.79	1.77	3.72	3.64
Passenger cars inspected.....	26,746	33,427	27,220	29,456
Per cent defective.....	1.04	3.85	1.87	.85
Locomotives inspected.....	33,761	38,784	31,721	37,199
Per cent defective.....	4.98	4.06	3.66	2.69
Number of defects per 1,000 inspected	67.48	57.23	45.56	41.16

A marked decrease is shown in the percentage of defects found in equipment inspected during the year, the percentage of defective freight cars, passenger cars, and locomotives all having reached the lowest point in the history of safety-appliance inspection. It is significant that this decrease has been attained by the carriers during a period not only of the greatest increase in volume of traffic ever handled by the railroads but also marked by a scarcity of labor and an inadequate supply of cars.

At a hearing on March 13, 1917, it was shown that 296,033 cars were not fully equipped in conformity to the prescribed standards of January 1, 1917. It also appeared that the carriers were confronted with practical difficulties, such as car shortage, insufficient labor, inability to obtain new equipment, and congested traffic conditions. Upon consideration the commission on April 12, 1917, granted a further extension of eight months from July 1, 1917, within which to comply with paragraphs (b), (c), (e), and (f) of the order of March 13, 1911.

Thus the order will become effective March 1, 1918, and the combined efforts of all carriers should be directed to the equipment of cars on each of their lines of road regardless of ownership, the owning carrier to be billed for the expense.

Attention is directed to the number of defects per 1,000 cars inspected, respecting the visible parts of air brakes. This number of defects—19.01—is out of proportion to the number of defects to other safety appliances; in fact, 46 per cent of all safety-appliance defects reported are due to defective air brakes. Thus a situation obtains which can not be too strongly condemned. The maintenance of the air brake to the point of maximum efficiency is a consummation to be striven for by all carriers regardless of whether the grades on a particular line of road demand such efficiency in the ordinary movement of trains. Level roads should maintain their air-brake equipment to the same degree as those having steep mountain grades. The impression is too prevalent that the order of the commission of June 6, 1910, is complied with when 85 per cent of the cars in a train have their power brakes

used and operated, and this, no doubt, accounts in part for laxity in maintenance.

The standing tests of air brakes provide the only adequate means of ascertaining the true condition of braking power and as an element of safety is of inestimable value. It is encouraging to note that an increasing number of yards are being equipped with compressors and air lines for the testing of air-brake equipment, thus enabling proper adjustments and repairs to be made. However, there are too many terminals and yards where the only air-brake tests made consist merely of ascertaining whether or not the air is working throughout the train line. Such tests are inadequate, for the reason that the efficiency of individual brakes can not thus be determined. A system of careful inspection and tests at terminals by experienced and competent inspectors is therefore urged as a means of insuring adequate braking power on all trains.

Table No. 3 presents the condition of air-brake equipment in its most favorable aspect for the carriers, as it indicates the final result of inspections by our inspectors accompanied by the carriers' inspectors. In such inspections, in many instances, the first test develops that not even the minimum of 85 per cent of the brakes are operative, whereupon adjustments and further tests are made before the train leaves the terminal. The figures represent the condition disclosed by the final test; that is, the condition of the brakes when the train departed. These cases are not rare or isolated, and the very fact that when the commission's inspectors conduct terminal tests it is frequently found necessary to make repairs before even the minimum percentage of operative brakes required by law is available in trains discloses not only the need of better maintenance of air-brake equipment but also the absolute necessity for terminal tests and greater care and thoroughness in making them.

During the past fiscal year our inspectors not only inspected a greater number of cars and engines but in addition they investigated 80 accidents and conducted numerous special investigations respecting car shortage, and assisted in a number of tests of appliances relating to safety in railway operation. In their numerous activities they have shown marked ability and fidelity to duty.

HOURS OF SERVICE

During the year ended June 30, 1917, hours-of-service reports were filed by 1,189 roads. Of the roads that rendered reports, 448 reported a total of 135,513 instances of all classes of excess service, an increase of 37,201 as compared with the previous year. The remaining 746 roads filed reports showing that no excess service was performed by their employees.

Of the 135,513 instances of excess service reported, 112,341 were employees remaining on duty longer than 16 consecutive hours, 3,432 were employees continued on duty after having been on duty 16 hours in the aggregate in a 24-hour period, 723 were employees who, having been on duty 16 consecutive hours, were returned to duty with less than 10 consecutive hours off duty, 184 were employees who, having been on duty longer than 16 hours in the aggregate in a 24-hour period, were returned to duty with less than 8 consecutive hours off duty, 25,820 were employees at continuously operated offices remaining on duty longer than 9 hours, and 3,455 were employees at offices operated only during the daytime, who remained on duty longer than 15 hours.

The causes of instances in which train service employees remained on duty longer than 16 consecutive hours on roads

reporting more than 25 instances of excess service, for the past five fiscal years, have been arranged in the following table for the purpose of comparison.

Causes	1913	1914	1915	1916	1917
Collisions	9,910	5,099	1,703	3,414	3,421
Deraillments	88,317	53,481	25,209	25,013	30,395
Track defects and obstructions	10,620	5,712	2,567	4,696	3,982
Landslides, high water, fire	17,985	2,852	2,407	2,983	3,064
Adverse weather conditions	6,243	15,135	2,929	9,532	10,616
Congestion of traffic	13,812	3,992	1,059	1,769	16,250
Station work, waiting for orders and meeting trains	8,279	4,353	2,256	2,822	5,057
Conductor and drawbar defects	33,360	10,252	5,117	5,113	6,292
Miscellaneous car defects	17,753	10,914	7,509	9,386	10,246
Hot boxes	3,869	895	296	232	491
Air troubles	5,834	1,476	884	1,054	854
Taking or running for water	2,953	1,085	608	466	1,010
Clearing fires	519	138	40	45	181
Low steam:					
Poor coal	485	269	95	30	671
Bad water	423	105	49	46	28
Leaking	5,585	1,818	882	607	656
Miscellaneous locomotive mechanical defects	15,507	6,810	3,779	3,616	4,738
Wire troubles	2,072	689	119	168	206
Sickness, death, personal injury	923	381	156	131	173
Miscellaneous	16,883	5,879	1,709	1,932	2,905
Total	261,332	131,332	59,373	73,055	101,242

The foregoing table shows an increase of 28,187 instances in which employees remained on duty longer than 16 consecutive hours over the number reported for the preceding year. More than 50 per cent of this increase is chargeable to one road. The enormous increase in business incident to the extraordinary demands upon the carriers led to congestion of traffic and to this cause alone one road attributed 12,032 more instances of excess service than were reported by it for the previous year. In addition to the figures shown under the heading "congestion of traffic," the increased number of instances of excess service shown under "derailments" and "station work, waiting for orders, and meeting trains" were undoubtedly largely attributable to the business increase of the carriers. Comparing these three classifications for 1917 and 1916 there was an increase of 22,098 cases of excess service of employees engaged in train service in 1917 caused by increased business, or more than 78 per cent of the total increase shown by the table.

A very gratifying decrease has been noted in the number of instances in which employees were compelled to return to duty without having had the required statutory periods off duty.

The number of instances in which telegraphers remained on duty longer than the periods permitted by law increased more than 57 per cent, probably due largely to the increased business which is reflected in congestion of traffic, and to the difficulty experienced by the carriers in securing and keeping competent employees.

It is suggested that in order to remove the diversity of court opinion, Congress should enact legislation that will make certain the intent of the law regarding the limitation of the hours of service, of the period within which such service may be permitted, and of the circumstances, if any, under which an employee may lawfully be released in such manner as to extend his period of duty beyond the 16-hour limit prescribed by law.

MEDALS OF HONOR

The investigation of applications for medals of honor under the act of February 23, 1905, has been continued, and two such medals have been awarded during the past fiscal year. The act authorizes the President to bestow bronze medals of honor upon persons who by extreme daring endanger their own lives in saving, or endeavoring to save, lives from any wreck, disaster, or grave accident, or in preventing, or endeavoring to prevent, such wreck, disaster, or grave accident upon any railroad within the United States engaged in interstate commerce. Since the passage of this act, 31 applications for medals have been filed, 22 of which have been approved and medals awarded, and 9 have been denied.

INVESTIGATION OF ACCIDENTS

During the year ended June 30, 1917, this bureau investigated 80 train accidents, comprising 54 collisions and 26 derailments; 174 persons killed and 827 persons injured. Twenty-one of the collisions occurred on block-signalized lines, 11 being on lines where automatic block signals were in use and 10 on lines using some form of manual block system. Thirty-three of the collisions occurred on lines where the train order and time interval system of train operation was in force. Eight of the 11 collisions which occurred in automatic block signal territory were due to the failure of engineers to obey signal indications. In these eight collisions 30 persons were killed and 77 were injured.

Disobedience of signal indications on block-signalized railroads presents one of the most serious problems. Some of the most disastrous accidents are due to this cause and occur on roads equipped with modern systems of automatic block signals where trains are operated by trusted employees of long experience. The investigation of probably the most serious accident which occurred during the past year disclosed that the signal system in use was of comparatively recent installation and represented the highest development of automatic block signaling practice. The apparatus was surrounded with all safeguards necessary to insure its proper operation, and thorough inspection and tests of the signals at the point of accident demonstrated that they were in normal, operative condition. However, a collision, resulting in the death of 20 persons and the injury of 5 persons, was caused primarily by the failure of an experienced and competent engineer properly to observe and to obey block-signal indications partially obscured by a dense fog. In a very large percentage of accidents due to this cause which have been investigated, a contributing factor has been dense fog or stormy weather. In previous reports it has been pointed out that the practice of permitting fast trains to run at normal speed under such conditions constitutes a grave menace to the traveling public, and it has been recommended that during foggy or stormy weather, when signal indications can be seen but a short distance, unless some form of automatic train control system is used, positive and definite instructions should be given prohibiting the running of trains at high speed.

Of the 10 collisions investigated which occurred in non-automatic block-signal territory, 4 were due primarily to the failure of engineers to have their trains under proper control when approaching meeting points or in yards, 1 was caused by failure of a train crew to obey an order fixing a meeting point, 1 was caused by failure to protect by flag and another by the failure of a flagman to close a passing track switch, 1 was caused by failure of an engineer properly to manipulate the brakes for the control of a train on a mountain grade, 1 was due to the failure of an engineer to obey a stop indication of a dwarf signal, and 1 was due to cars fouling the main track.

The investigation of the collisions noted which occurred in non-automatic block-signal territory indicated that in certain instances little if any additional protection, as compared with the train-order and time-interval system, was afforded under the methods of operation employed. As was pointed out in the report for last year, on certain roads where the manual block system is used the investigation of accidents has disclosed that the benefits of the block system have been practically nullified by inexcusably bad operating practices, and even the most common and essential safeguards provided for the operation of trains have been disregarded. Nearly all of these accidents could have been averted by proper observance of the rules which were in effect. More than half of the collisions investigated during the past year occurred on lines operated by the train-order and time-interval system, and many of them were rendered possible by the inherent weaknesses of the method of operation employed.

In some of these cases inadequate operating rules were found, and in some instances it was found that practices were being followed which had grown up in the service, but which were not sanctioned by the rules. In one or two instances the employees involved failed to avail themselves of the facilities and safeguards for governing and protecting train movements provided for in the rules and resorted to methods and practices which could not in any manner be warranted or justified. It is a striking fact that the primary cause of each of the accidents investigated which occurred on lines operated by this method was the failure of one or more employees properly to perform some part of their duties; or, in other words, a so-called man failure. Many of these accidents could have been prevented by a proper application of block-signal principles. In comparison with the train-order and time-interval system, the block-signal system affords not only fewer opportunities for men to make mistakes likely to result in disaster, but it provides means for checking up and detecting such errors as do occur. It is true that accidents happen on lines operated by the block system, but it must be borne in mind that in general the lines carrying the densest and fastest traffic are operated by the block system, while the train-order and time-interval system is employed on lines of lighter and thinner traffic. It can not be questioned that there would be a very marked increase in accidents if an attempt were made to operate the block-signal lines by the train-order and time-interval system; and it is equally certain that the adoption of the block system, together with adequate rules and proper operating practices, on lines now operated by the train-order and time-interval system, would avert numerous accidents on those lines. Since 1903 it has been repeatedly recommended that railroad companies be required by law to adopt the block system on lines not already so operated, and it is again urged as one of the most important measures for the prevention of railroad accidents that the use of the block system be made compulsory.

In previous reports the Commission has recommended legislation requiring the standardization of operating rules. It is obviously essential to the safety of train operation that rules be explicit and uniform, capable of being easily understood and applied, and not liable to be misinterpreted. Such standardization of rules can be accomplished only by Federal legislation. Cases have frequently been found in connection with the investigation of accidents where employees in responsible positions had not been properly instructed or examined on the rules; and any legislation which may be enacted upon this subject should provide for proper supervision to insure that railroad employees are properly instructed and examined, as well as that the rules are properly enforced and obeyed.

The commission's annual bulletin containing statistics for the calendar year 1916 shows that during that year there were on steam railways 5,737 collisions and 8,253 derailments, the total number of both collisions and derailments having increased but continuing in approximately the same proportion as compared with the two preceding fiscal years. Approximately 83 per cent of the derailments which occurred during the calendar year 1916 were due to two causes, 4,185 being attributed to defects of equipment and 1,664 being caused by defects of roadway. Twelve of the derailments investigated during the past fiscal year were caused by defective condition of track and track equipment.

Speed was a direct cause or a contributing factor in 9 of the 26 derailments investigated, 2 of them being due to excessive speed on sharp curves, 1 being due to a locomotive running backward at excessive speed over uneven track, another being caused by excessive speed with one side of locomotive disconnected, and another probably being caused by freight cars being run at excessive speed.

While defective equipment is apparently the most common

and prolific cause of derailments, it is manifest that the most favorable result that can be attained by even the most rigid and thorough inspections which it is practicable to make is merely a reduction in some degree of the accidents due to this cause, for the reason that a derailment may occur at the time the equipment becomes defective. But it is believed that the cases in which the track or roadway becomes defective under a passing train and precipitates a derailment immediately form a very small percentage of the total number of derailments due to defects of roadway. As has been pointed out in former reports, existing federal law does not give the commission any supervision or jurisdiction over the condition of railroad track, and the commission is without authority to require its proper maintenance, although in many cases disclosed by investigation of accidents and in connection with regular inspection work performed by the commission's inspectors railroad tracks have been found so poorly maintained as to constitute a grave menace to the traveling public. It is beyond question that the existing condition of such tracks is responsible for a large proportion of the number of accidents due to defects of roadway. These matters have been pointed out in previous annual reports, and in various accident reports attention has been called specifically to certain roads and localities where better track maintenance was imperatively demanded by the requirements of safety. It is again recommended that the commission be given authority to conduct independent investigations with respect to physical conditions and operating practices on railroads, and to require the improvement or correction of unsafe conditions or practices which may be found to exist.

Investigations relative to failed material of both track and equipment have been continued during the past year. As was stated in the report for last year, there are some accidents due to failure of materials used in track and equipment which may be prevented by more careful inspection, while others can not be prevented by any sort of inspection, as the defects are hidden and do not disclose themselves until the material has failed. Several reports have been issued during the past year containing the results of investigations of failed material.

INVESTIGATION OF SAFETY DEVICES

During the year plans of 94 devices were presented for consideration; 111 devices were examined and opinions thereon transmitted to the proprietors. Of the number examined, 99 were so impracticable or crude that they were considered worthless; 2 possessed meritorious features, but as a whole required further development before being entitled to serious consideration; 8 were devices which were not intended primarily to promote safety and which would not affect the safety of railway operation sufficiently to warrant further consideration, and 2 were considered to possess merit but were no better than similar devices now in use.

Supplemental tests of the Wooding train-control system on the Delaware, Lackawanna & Western Railroad, near Newark, N. J., referred to in the last annual report, were conducted during the months of January, February, March and April, 1917. The device had been redesigned in many respects and parts of the apparatus rebuilt since the previous tests were made. A report upon this system, dated May 10, 1917, was transmitted to the Congress by the commission.

During the month of February, 1917, the operation of the Julian Beggs train-control system, which, as stated in the last annual report, was installed on the Queen & Crescent Route near Cincinnati, was observed preparatory to conducting official tests. It was found, however, that under the cold-weather conditions existing, the locomotive equipped with this apparatus was too small to haul the full train to which it was assigned; and as the company owning this device was not able to equip a larger locomotive and conduct proper preliminary tests of the apparatus before the season

had so far advanced as to preclude possibility of conducting the proposed official tests under the severe weather conditions of winter season, it was decided to postpone the proposed tests of this system until the coming winter season.

The revision of the automatic train-control system of the National Safety Appliance Co., San Francisco, Cal., mentioned in the last annual report, was not completed during the past fiscal year and the apparatus had not been developed sufficiently to require further inspection or trials.

The automatic straight air-brake system submitted by the Automatic Straight Air Brake Company, and mentioned in the last annual reports under the name of the California Valve & Air Brake Company, has been revised as a result of tests made by this bureau on the Atchison, Topeka & Santa Fe in November, 1915. Arrangements are being made by the proprietors to install the revised apparatus on the Virginian Railway for tests under the direction of this Bureau.

The annual statistical report for January 1, 1917, covering block-signal and train-order mileage, was compiled by this bureau and published by the commission. As shown by

this tabulation, the total length of railroad in the United States operated by the block system on January 1, 1917, was 98,407.9 miles, of which 32,954.6 miles were automatic and 65,453.3 miles were nonautomatic. Comparing these figures with the corresponding record contained in the bulletin of January 1, 1916, there was an increase of 2,012.1 miles of road operated by the automatic block system and a decrease of 179.8 miles of road operated by nonautomatic block system. The tabulation indicates a net increase during the year in mileage of road operated by the block system of 1,832.3 miles.

RAILROADS TO ASSIST AVIATORS.—Among the rules adopted by the aircraft board, to be followed by the public in its treatment of army aeroplanes which may be forced down by accident, is one requesting railroads to ask all employees to keep watch for aviators landing in isolated regions and to furnish assistance. All trains or steamships are requested to stop to take on stranded aviators and also at whatever point the aviator may desire to leave the train or boat.



Looking Across the Richmond Yard; the Imo May be Seen at the Left on the Dartmouth Shore



The Wrecked Intercolonial Railroad Station in Which 60 Were Killed by the Falling of the Roof



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The Halifax Explosion Did Not Leave Much of the Richmond Railroad Yards

THE NEED FOR STORAGE FACILITIES*

By Francis Lee Stuart
Consulting Engineer

The first problem of the United States government in the present war is to marshal the resources of the country to produce, distribute and use such military supplies as may be necessary to win the war—and its second problem is to carry through such aims with the least possible disruption of economic conditions so that our people may have recuperative power to meet and cope with the more serious period of readjustment after the close of the war.

It seems logical that in the fourth year of the war the effort of the United States in order to be effective should be so ponderous that it will be irresistible, and to accomplish that end the production of material and men must accordingly be planned. The distribution of necessary men and supplies must depend on applied simplicity for the success of its large continuous movement. The use of men and materials of war as far as this discussion is concerned, may be left to the field of operations.

The resources of the country will produce the needed military supplies, and it is therefore absolutely essential that such supplies should be so distributed that they will finally be under actual military control in order that there may be a dependable quantity for use when and as needed.

With the above essentials in mind, the Terminal Port Facilities Committee and the Storage Committee of the War Industries Board have recommended to the Depot Board of the War Department that—

(a) Storage areas and port facilities be created abroad for holding several months' supplies.

(b) That storage areas under military control be created at Atlantic ports to hold in storage several months' supplies, and that a number of ports be used instead of two or three.

(c) That interior storage areas be provided near the source of production for the collection of carload or train-load shipments to the terminal ports.

In operation, as the storage reserve abroad is drawn on for use at the front, it is replenished by requisition from Atlantic terminal ports, which in turn are kept up to a fixed reserve by moving up supplies in an orderly manner from the source of production.

With the full realization that the winning of the war is the largest undertaking embarked upon by this nation, the various committees have felt that methods or principles of doubtful effectiveness were unwise, and were unanimous in recommending the safe and simple methods outlined.

Speaking as an individual, as an engineer, and not as a member of any committee, I wish to explain some of the logic involved in such an obviously simple recommendation and the bearing that it has on present transportation congestion. The ports selected were selected because the export and import shipment business of the United States for the last 20 years has built up interior transportation facilities in proportion to the business of the various ports, and in this emergency there is neither time nor man-power to create greater railroad road facilities than now exist, and the entire country's rails, North, East, South and West should be used to an economical advantage.

Engineering students of transportation know that the present methods of export transportation which rely on cars meeting ships or holding cars to load direct to ships should be abandoned as it is inefficient and uncertain. Preferential orders which command are in effect, priority orders and such orders cannot be depended upon for any continuous effort, as they will disrupt and break down any organization whether designed for transportation or for commercial purposes, so that storage areas are essential at the ports for the

unloading of cars into them immediately upon the arrival of the cars and these areas are to be capable of holding several months' supplies available by lighters, truck or car for loading quickly any ship offered without delay.

The storage areas require sufficient size for expansion, as the uncertainties of the war are such that no man can foresee whether we shall have to furnish military material for two million or four million men or even a greater number. It is wise in planning for such a movement that the areas selected should be large enough to easily take care of a storage which can be expanded as required to meet the varying emergencies which may arise, without having to create new organizations or educate large forces in new methods.

It is necessary to build storage areas as there are no suitable storage areas available which are unoccupied by industries. The necessities of war will have a disastrous enough effect on the economic health of the country even with well thought-out endeavors to conserve the earning power and effort of the community and prevent the tearing down or disrupting of going concerns which in their indirect way, if not in a direct way, are necessary for our continuing strength.

Warehouses and layouts of the storage areas have been designed with due consideration of safety from fire or other risks. Quickness of despatch to ships, efficiency and simplicity of operation are other important and contributing conditions in the development plans, and while the storage areas are close enough to rail facilities which serve the ports they are segregated and their operation should not greatly interfere with the other efforts of the country.

Piers and berthing spaces for ships are available at every port, and it is recommended that we conserve man-power and materials by using such facilities as loading places for ships with materials from the nearby storage areas.

In 1913 had the business of the country been normally progressive the railroads would have been unable to avoid congestion as their improvements were not abreast with their needs; without the addition of new facilities the congestion of today was a certainty from every angle. Such congestion has been greatly augmented by abuses in use of cars for storage.

What can we do to avoid such congestion? In my opinion the greatest useful relief that can come in this crisis is the physical co-ordination of the railroads and a formidable public demand which will dictate a change in our business methods and coerce an immediate unloading and release of a car. This will require re-adjustment of business sites in the end, but the methods most intensively used to accomplish such result will be a storage area as a part of a business policy in every plant and a greater use of the already prepared roads, such as a city street for distribution by trucks or other means which do not require special tracks.

As to the railroad question per se, as long as republics require and encourage private capital to take the business risk of their early development and growth, there will be a desire as the country grows older and new generations control, to repudiate the cost of such agency in spite of the fact that such help has made them great; but regardless of the merits of the case this is not an opportune time for either party to force the issue.

The railroads' financial structure and credit have been crippled—how or why we have no time to consider now—Their full usefulness must be conserved at all cost, but it seems to me unwise to further jeopardize their efficiency by government experimentation with their working organization. The railroads today are manned by an organization that has taken years to create and train. Their ability is unquestioned. The Railroads' War Board has its records behind it and only business effort ahead and is the survival of thousands of able men who have been seeking the same recognition. In my opinion, there is nothing in the accomplishment of any other business body today and certainly

*Address at the annual meeting of the Academy of Political Science New York City, December 14, 1917.

not in the record of any government supervision that seems to me justifies any expectation that they could so efficiently guide the railroads' efforts as such a Railroads' War Board working with and for the President of the United States.

The congestion of today will be at its height in February and March. There will be attacks, criticisms, and what-not, and the usual scattering of ideas. The danger is that the country will try some cure-all, which will cause added confusion which will take months of efforts to overcome.

Let us hope it will be possible to get decisions and co-ordinate the many unrelated efforts of the government, and in spite of slow progress for the next few months, hold steadfast to tried methods of simplicity.

THE ACCOUNTING DEPARTMENT WAR PROBLEMS

In accordance with a resolution adopted at the meeting of the Association of American Railway Accounting Officers, held at Chicago, Ill., September 26, 1917, the president appointed a special committee of five to prepare recommendations as to how accounting officers may best meet the conditions confronting them with respect to clerical labor and the compilation of statistical data, particularly with respect to the use of mechanical devices as a means of solving the shortage in experienced clerical labor. The committee consisted of Mr. J. B. Duke, assistant comptroller, Southern Railway; C. E. Hildum, auditor of freight accounts, Erie; W. T. McCulloch, auditor of revenue, New York Central; J. S. Donaldson, assistant comptroller, Pennsylvania (chairman); and J. J. Ekin, general auditor of the Baltimore & Ohio.

After very careful and thorough consideration of the matter, the committee reported as follows:

It follows naturally that the answer to this phase of the situation depends largely upon the ability of the railroad to offer to clerical labor such compensation as would invite the acceptance of employment. On the assumption that each carrier is meeting the situation from the standpoint of offer of the highest compensation, which they are in a position to tender applicants for employment, consideration has been given, first: as to how to procure clerical labor. The present practices generally followed are: by awaiting applications from those seeking employment; advertisements in newspapers; notifying local agents of the desire of the general office to procure help; as well as through the various employees already engaged in the offices; and by application to business schools and colleges; and by the establishment of preliminary schools for the development of students to a point where it would be determined whether employment in the railroad offices would be tendered to such students.

The following suggestions are made:

In centers where it can be accomplished, co-operative schools, conveniently located, be established by the accounting officers of the carriers, through which students at such schools will receive sufficient development to determine whether or not they are qualified for positions in the accounting department of any of the carriers. The course of training in such school to be of such a character that the experience would be valuable to the carriers.

RETAINING AND DEVELOPING THE FORCES EMPLOYED

It is found that the practice prevails today of establishing night schools at which the employees of the accounting department are invited to attend, in order that they may receive instructions and education along particular lines, such as the application of rates and tariff classifications and divisions, the use of mechanical devices, shorthand and typewriting; and it is suggested that these be also extended so as to include instruction along other particular lines where there is necessity for help in such branches of the accounting departments and where vacancies are likely to occur.

The matter of office supervision is considered a very important feature in the development of efficient clerks and particularly so at this time when there is such a large proportion of such clerks who by lack of experience fail accurately to perform the work assigned, and it is recommended that those charged with the duty of overseeing the work should give very careful scrutiny to this, in order that unnecessary work may be avoided, which naturally follows inaccurate or imperfect production, with the thought that correct and proper handling of work in the first instance would eliminate much unnecessary work involved in the subsequent correction of the inaccuracies.

The assignment of certain picked employees to this feature of office practice as a special proposition seems highly desirable and has produced beneficial results where carried out.

COMPILED OF ACCOUNTING AND STATISTICAL DATA

It has been found that practices are in effect in the accounting departments of careful scrutinizing statistics or accounting department data which is furnished, to the extent that in every case the necessity for the data is being carefully inquired into and the cost of preparing it submitted at the same time, with the result that it has been developed that the data sought for involved an unwarranted expense as compared with the use to be made of such data, and this practice has resulted in the curtailment of such information, or the elimination of it entirely.

It is recommended that the accounting officers take the initiative by asking the co-operation of the traffic, operating and other departments in a canvass of the situation, respecting statements and statistical data prepared, with the idea in view of determining what, if any, real practical use is made of the information furnished, or if the company's interests would be in any way injured if such statements or statistical data would be discontinued. It is recommended that consideration be given to the question of estimated earnings and expenses during the war period, as it is felt that a saving in clerical labor can be effected in this way. It is also recommended that very careful consideration be given to the elimination of furnishing copies of billing to traffic officers, or to connecting lines, as it is very probable that to a very great extent no adequate use is being made of such copies, or where use is being made, it is questionable whether the service obtained from such copies justifies the expense involved in preparing and mailing it.

Too much consideration cannot be given to the establishment of through billing when through rates are provided and simplified per cents are provided for apportionment of the revenue. This matter is now receiving attention of the highest executive officers and accounting officers should take an active interest in preparing data for consideration of such executives, which will demonstrate to them the increased cost and the delay to traffic which results from junction billing, and should, also, show the burdens which are transferred from agencies to audit offices by the inauguration of interline billing, when percentages are not provided. This association has been active for years in its endeavor to secure through rates and simplified divisions and every advantage should be taken of the present opportunity, as economies of operation and conservation of man-power are sure to result from the extension of interline billing when percentage basis of division can be used. It is the thought of this committee that through billing arrangements should not be extended, except when through rates and percentage divisions are provided, unless, it may be found desirable by interested lines to arrange for two line through billing even when the arbitrary method of apportionment must be used.

In the agencies, much labor can be eliminated by the abolishment of detailed forwarded reports and reducing such reports to merely a record of waybills made, by num-

bers, and giving the auditor sufficient record to check the reporting of the waybill by the receiving agent.

In the matter of collection of charges from accommodation parties, by having the waybills pass through a revision bureau before the freight bills are tendered to the accommodation patrons and having all the collections made through a central bureau representing the treasurer, much detailed clerical labor can be saved in the local freight stations.

In the matter of billing, the committee would strongly recommend the use of a separate waybill for each shipment as being the means whereby, when desired, all the documents necessary for the transportation, accounting and collection of charges for a particular shipment can be prepared in one operation, as well as facilitating the movement of freight with the billing and making waybills more legible by reason of having only one shipment on each waybill. Consideration should also be given to the elimination of duplicate auditing of interline accounts, two or more roads accepting the audit of one carrier, covering both passenger and freight business, so that the audit of one carrier will be sufficient to protect the interests of both.

ACCOUNTING MECHANICAL DEVICES

It is suggested that each of the standing committees make a supplemental report to those already existing in the proceedings of the Association of American Railway Accounting Officers on June 26 and 27, 1912, at Quebec, with regard to the use of mechanical devices.

Under present conditions, every effort should be made to strengthen our forces—both in the general offices and at local stations—by the use of mechanical devices. It is not

practicable for this committee to go into details with respect to the merits of the various kinds of machines, as the adaptability of such machines can best be determined by study of local conditions. The principle governing the installation should be kept clearly in mind—that mechanical devices which may be operated by female clerks, without extensive experience, should be used wherever practicable, to release experienced men to take care of the more technical part of the work with which they are familiar. As examples—computing machines may be used for figuring extensions and footings on waybills—permitting revision clerks to devote their entire time to the revision of rates. Such machines may also be used for making extensions on shipping orders, and waybilling machines for preparing waybills, reducing to a considerable extent the work performed by experienced rate clerks.

Mechanical devices when installed should be accompanied by expert operators and their use should be carefully supervised. No economy is effected by the purchase of costly machines to be used under any other conditions.

NORTHWESTERN OPENS SOCIAL SERVICE BUREAU FOR SOLDIERS

With lines running both to Camp Grant, Ill., and the Great Lakes Naval Training Station, the Chicago & North Western carries more sailors and soldiers in and out of Chicago than any other road. Recognizing that the Chicago terminal of the North Western is an exceptionally large gathering point for these men, the executives of the road decided that it was the logical location for recreation rooms and a social service bureau for them.

Many of the soldiers and sailors are strangers in the city and exposed to the dangers growing out of chance acquaintances and unfortunate environments encountered in the quest for entertainment. It was with this idea of furnish-



Photograph by Central News Photo Service.

View Through a Shell Hole in a Damaged House on the Cambrai Front, Showing Tommies Loading a Light Railway Car with Bombs



Social Service Secretary at Work

ing them with wholesome recreation and suitable companions that a social service bureau was opened in the station for the registration of soldiers and sailors. Each man who desires to do so may leave his name with the social service attendant, stating the time he will be in Chicago and the length of his stay, even though it be for only an hour. Citizens of the city, on the other hand, who desire to extend their friendship to the enlisted men are asked to notify the bureau when they can entertain a soldier or sailor and leave. Both parties are brought together in this manner and in this

way enlisted men are provided with wholesome entertainment, whether it be a dinner, a dance or a theatre party.

For the entertainment and comfort of the men while waiting for trains at the terminal the North Western has provided recreation rooms containing comfortable chairs, reading and writing materials, music in the shape of a victrola

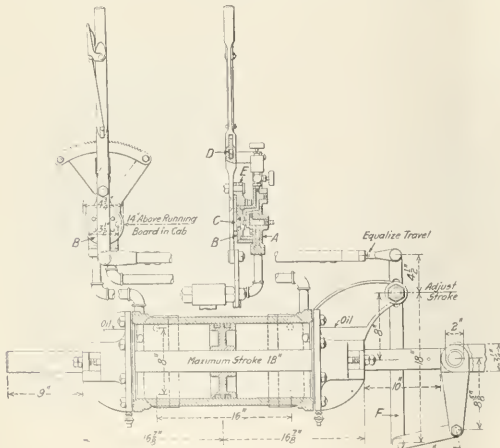


View of Recreation Room

and piano, bathing facilities in the way of porcelain tubs and shower baths, and a modern lunch counter where lunches can be procured at the lowest prevailing prices. In addition, cigarettes, cigars and candies are sold at cost.

LEWIS POWER REVERSE GEAR

The Lewis power reverse gear, which is shown in the illustration, is characterized by simplicity of construction and a high degree of adaptability so far as its location on the locomotive is concerned. These qualities have been obtained by the location of the control valve in the cab, where it is



The Lewis Power Reverse Gear

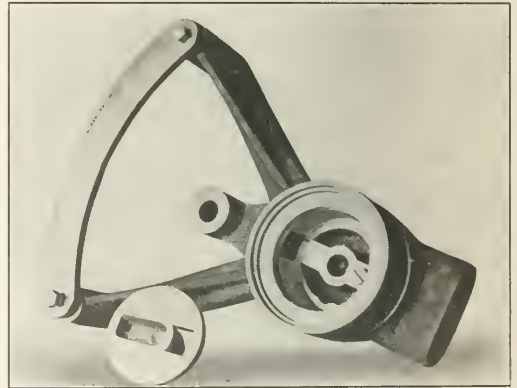
directly connected to the reverse lever, and by dispensing with the crosshead and guidebar for the piston rod. This gear is the development of the Commonwealth Supply Company, Richmond, Va.

The attachment of the gear to the locomotive is effected by means of brackets cast integral with the cylinder. Because of the absence of attachments for a guidebar or other parts of the gear, it is thus possible to bolt the gear directly

to the under side of the running board, to brackets attached to the boiler or to the frame of the locomotive, as the requirements of each particular case may make most desirable. The cylinder is merely turned to bring the faces of the brackets in the desired plane, the cylinder and heads being assembled with the brackets at the top, sides or bottom, as the case may be. The drain cocks have been placed in the cylinder heads in order that there may be no need of drilling special holes in the cylinder for each method of attaching the gear to the locomotive.

The control valve is of the rotary type with the seat in a vertical plane. Air is admitted to the top of the valve in the valve housing *A* and is admitted to the cylinder ports by means of a port through the valve. The exhaust cavity in the face of the valve is always in communication with a port in the valve housing leading directly to the atmosphere. The valve is operated by means of a stem or port *C*, in the end of which is a slot fitting over a rectangular lug on the top of the valve, thus relieving the valve of any tendency to tilt due to improper alinement of the operating post. To the outer end of the post is keyed a short arm, in the upper end of which is a slot working over a hardened block on the reverse lever.

The reverse lever has no fixed pivot. The initial movement of the lever is pivoted about its lower end, where it is



The Quadrant and Valve Housing with the Rotary Valve Removed

pinned to the back end of the reach rod. The extent of this movement is limited by a special tap bolt in the valve seat, the head of which extends up into the admission port in the valve and permits the valve to move in either direction only sufficiently to register with the admission ports in the valve seat. If the movement of the lever is forward, air is admitted to the rear end of the cylinder and immediately causes a forward movement of the piston. This is communicated to the lower end of the lever through the stroke lever *F* and the reach rod, and permits the continued movement of the upper end of the lever in a forward direction. During this part of the motion the lever is pivoted about the control valve connection and is retained in its proper location relative to the quadrant by means of the reverse lever guide *E*. This guide is a sleeve mounted on the valve housing, about which it is free to revolve. When the desired movement of the reverse lever is completed and the lever latched, the latch on the quadrant becomes the fixed point in the further movement of the lever necessary to lap the valve.

The quadrant is notched for 30 cut-off positions each in forward and back motion, a very fine adjustment thus being provided. There is a spring latch *D* on the reverse lever

which operates underneath the quadrant to indicate when the lever is in central position. This assists the hostler in locating the exact center of the motion with certainty.

When there is no air pressure on the reverse gear, the lever can be moved only slightly; it is impossible for it to be thrown into one of the corner positions until air pressure is available to effect the movement of the link blocks to a corresponding position. This is the result of the limited movement of the rotary valve. After the side of the valve admission port comes in contact with the head of the tap bolt projecting up from the seat of the valve the further movement of the reverse lever is dependent entirely upon the movement of the piston.

One of the unique features of this reverse gear is the ease with which the length of the piston stroke may be adjusted without blocking off the corners of the quadrant. There is a vertical slot in the stroke lever *F* where it is pivoted to the front cylinder head. The end of the pivot pin extends through this slot, in which it is secured by two nuts, one on either side of the lever. An adjusting screw, the length of which is equal to that of the slot in the stroke lever, is threaded through the pivot pin, and by means of this screw the position of the pivot pin in the slot is determined. It is possible with this arrangement to vary the relative lengths of the two arms of the stroke lever by an amount sufficient to change the length of the stroke from 18 in., which is its maximum, to 15 in., without affecting the movement of the reverse lever on the quadrant.

A crosshead and guide having been dispensed with, the piston rod is guided by means of long sleeve glands in both cylinder heads. These glands are bored to a running fit for the piston rod and are of sufficient length to provide the necessary bearing area. The glands are adjusted against the packing in the usual manner. The cylinder heads are cast with large oil pockets which communicate with gutters milled in the piston rod glands for lubricating the piston rod packing and gland bearings. The lubrication of the control valve and the cylinder is cared for in the cab, the lubricator being attached directly to the valve housing *A*.

DEATH OF SENATOR NEWLANDS

Senator Francis G. Newlands of Nevada, chairman of the Senate Committee on Interstate Commerce and of the Joint Committee on Interstate Commerce which is conducting a general inquiry of subjects pertaining to railway regulation, died suddenly at his home in Washington on December 24. As chairman of the Senate committee he had been expected to take charge in the Senate of the railroad legislative program to be recommended by President Wilson and he had held several conferences with him on the subject.

Senator Newlands had been chairman of the Senate Committee for several years and has therefore had an important influence on all transportation legislation in Congress and under President Wilson he has been regarded to a considerable extent as the administration spokesman on railroad matters. Personally he has taken a great interest in transportation matters and he has generally been friendly to the railroad cause in his efforts to place railway regulation on a sound basis which would promote railroad development. For years he has been an advocate of federal incorporation for railroads. He has also taken a great interest in waterway and irrigation legislation and recently had succeeded in having passed a bill providing for a comprehensive study by a special commission of waterways both in their relation to transportation and in their relation to irrigation and flood control.

Senator Newlands was in his seventieth year. He was born near Natchez, Miss., August 28, 1848, and entered the Class of 1867 at Yale, which he left in the middle of his junior year. He studied law at the Columbian College Law

School at Washington, and before he was graduated was admitted to the bar of the Supreme Court of the District of Columbia. He went to San Francisco in 1870, and became there a prominent member of the bar. In 1888 he became a resident of the State of Nevada, from which he was shortly after elected to the Fifty-third Congress. He served several terms in the House of Representatives before being elected to the Senate in 1905.

DISASTROUS COLLISION AT SHEPHERDSVILLE, KENTUCKY

In a rear collision of southbound passenger trains on the Louisville & Nashville at Shepherdsville, Ky., 18 miles south of Louisville, at about 6 p. m. on December 20 (Thursday), 45 passengers and two employees were killed and 40 or more passengers were injured. The employees killed were the conductor and the flagman of the leading train, and these two men, in the accounts given by the road to the newspapers, are named first as those responsible for causing the collision.

The leading train was a local passenger, No. 9, which had just started forward from the station and was to be set off on the side track to wait for the following train, an express. This train, No. 7, was about two hours late. It appears to have come on at full speed, and the rear car of the local train and the one next to it, both wooden coaches, were split open and completely wrecked. The express train consisted of one of the heaviest locomotives and nine steel cars, and there were no serious casualties in that train.

The statement issued by the company says that the men in charge of No. 9 were blameworthy, not only at the station, but also before reaching Shepherdsville, for not protecting their train at the rear while they were losing time. It says also that No. 7 should have approached under control; this because the train-order signal, which was in the proceed position for the local train, was motionless, whereas the rule requires the engineman to refuse to pass such a signal unless he sees it change from the stop indication to the proceed indication. There was a clear view for two miles. The space-interval system was not in use, though this section of the road was reported, a year ago, as having the manual block system.

On Saturday, December 22, President Milton H. Smith issued a statement to the public proposing arbitration of claims against the railroad, on behalf of persons killed or injured, to save legal expenses. This statement said, in part:

"Standing in the presence of the gravest catastrophe in the company's history, I feel, speaking for my associates and myself, utterly unable to adequately express how deeply we deplore the deaths and injuries and how profoundly we sympathize with those to whom have come these sufferings and bereavements. They and the general public are entitled to know just how the calamity came about, and this they shall know to the fullest. . . . The Louisville & Nashville has never knowingly contested a just claim. . . . and I desire hereby to definitely acknowledge legal liability in the case of the death or injury of all passengers; and I propose and request that the Hon. A. O. Stanley, the Governor of Kentucky, appoint a committee of three men of integrity and high standing, one each from the counties of Bullitt, Nelson and Washington, to whom shall be submitted all claims, settlement of which the company and the claimants cannot agree upon, their decision to be final.

"This will save the claimants the delay and expense of litigation, will insure a certain and just determination of their rights, and will guarantee their receiving the full amount awarded instead of dividing it with others. This proposition is not dependent upon acceptance by all claimants, but is open for three months to all who may desire to avail themselves of it."

TRAIN ACCIDENTS IN NOVEMBER

The following is a list of the most notable train accidents that occurred on the railways of the United States in the month of November, 1917:

Collisions					
Date	Road	Place	Kind of accident	Kind of train	Kil'd Inj'd
11.	Western Md.	Garrett.	bc	P. & F.	1 4
12.	Denver & R. G.	Cotopaxi.	rc	P. & P.	3 16
24.	Union Pac. A. T. & Santa Fe	Topeka.	xc	P. & P.	0 6

Derailments					
Date	Road	Place	Cause of derailment	Kind of train	Kil'd Inj'd
5.	Central N. J.	Jersey City.	exc. speed	P.	0 1
11.	Great Northern	Minneapolis.	d. eq.	P.	0 2
21.	Seaboard	Millbrook.	.....	P.	0 1
22.	Norfolk & W.	Rippon.	d. eq.	P.	0 0
25.	St. Louis-S. F.	Weleetka.	acc. obst.	P.	2 3

The trains in collision near Garrett, Pa., on the 11th were through freights. Both engines and ten cars were badly damaged. One trainman was killed and four were injured.

The trains in collision near Cotopaxi, Col., on the 12th were eastbound passenger trains carrying troops. The leading train, moving at very low speed because of a freight train ahead, which had been delayed, was run into at the rear by a following train moving at about 25 miles an hour. Three soldiers were killed and sixteen were injured. Responsibility for the collision is charged against the men in charge of the leading train, who failed properly to protect the rear end of the train by flag.

The trains in collision at Topeka, Kans., on the 24th were a passenger train of the Union Pacific, No. 102, third section, carrying soldiers, and passenger train No. 105 of the Atchison, Topeka & Santa Fe. The U. P. train ran into the other at the crossing of the two roads. The U. P. train had stopped 300 ft. from the crossing. Three trainmen were injured.

The train derailed near Jersey City, N. J., on the 5th was an eastbound passenger. The locomotive left the rails and was overturned and one coach was derailed. One passenger

cars were ditched, three of them being overturned. The cause of the derailment was the failure of some part of the car first derailed, causing an obstruction on the track.

The train derailed at Millbrook, N. C., on the 21st was northbound passenger No. 4. The locomotive was overturned and one employee was injured.

The train derailed near Rippon, W. Va., on the 22nd was northbound passenger No. 28. All of the injuries to passengers and employees were reported as slight. The cause of the derailment was a loose tire.

The train derailed on the St. Louis-San Francisco, near Weleetka, Okla., on the 25th was a westbound through passenger. Traveling at full speed the engine was thrown off the track by a piece of iron wedged in a frog, and was overturned. The engineman and one other trainman were killed and three passengers were injured. The iron had been placed on the track by mischievous boys.

Electric Car Accidents—Serious accidents to electric cars occurred at Angola, N. Y., November 9; near Lorain, Ohio, November 8; near Youngstown, Ohio, November 12; and near North Lima, Ohio, November 4. Ten or more persons were injured in each accident and at Angola one of the injuries resulted fatally. Angola and North Lima were butting collisions; the Youngstown case was a rear collision in a fog and at Lorain a passenger train of the Lorain, Ashland & Southern ran into a street car at a grade crossing.

BURLINGTON CONSERVES FOODSTUFFS AND PREVENTS CLAIMS

An exceptionally early frost resulted in heavy shipments of damaged perishables this fall. To prevent a flood of damage claims and at the same time to conserve car space and save sound perishables from contamination by frosted vegetables, the Chicago, Burlington & Quincy inaugurated an inspection of perishable freight at points of origin. In the potato growing section of western Nebraska it has four inspectors who examine and make a record of each car of



Car Well Loaded for Bulk Shipment



Carelessly Loaded Car Containing Trash and Straw



Frozen Potatoes Sorted From Car

was slightly injured. The cause of the derailment was excessive speed at a crossover.

The train derailed near Minneapolis, Minn., on the 11th was an eastbound special passenger, carrying troops. Two trainmen were injured and several soldiers were slightly hurt. The train was traveling at about 40 miles an hour. Four

vegetables loaded for shipment. The railroad, of course, is bound to accept any shipment which it may receive, but the knowledge that a record is kept of the condition of the lading at the time of loading has been a sufficient inducement to shippers to sort out damaged perishables and send forward only those which are sound.

The right-hand photograph shows a pile of frosted potatoes which were sorted from a car at Alliance, Neb., because the inspector of the Burlington refused to give it a clear billing until the damaged potatoes were removed. The center illustration shows a car of Red Triumph potato seed stock which was loaded at Hemingford, Neb., and contained so

Abbreviations and marks used in Accident List:
 bc, Rear collision; —bc, Butting collision; xc, Other collisions; —b, Broken; —d, Defective; —unf, Unforeseen obstruction; —uns, Unexplained; —derail, Open derailing switch; —ms, Misplaced switch; —acc, Accident; —obstruction, —malice, Malicious obstruction of track, etc.; —boiler, Explosion of locomotive on road; —fire, Cars burned while running; —P, or Pass, Passenger train; —F, or Ft, Freight train (including empty engines, work trains, etc.); —A, Asterisk, Wreck wholly or partly destroyed by fire; —Dagger, One or more passengers killed.

much frost that it had to be resorted. The photograph, which was taken before the frozen potatoes were removed, also shows the careless manner in which the car was loaded. No effort was made to load the car to anywhere near capacity, and no pains were taken to sort the potatoes as to quality or size or to keep them free from straw and refuse. The view on the left shows a car well loaded for bulk shipment. This car was loaded practically to the roof at the ends and contained well-graded potatoes.

At the request of the railroads in Illinois, the State Food Administrator has agreed to provide inspection of perishables at points of origin to prevent damage to food in transit. It is expected that similar action will be taken by the food administrators in other states.

Because of the large percentage of wet corn this year, various agencies are taking steps to prevent unnecessary loss on this account. At some points artificial driers have been provided, but this method of saving the grain is too expensive for general use. The Burlington recently sent out a bulletin to bankers, county newspapers and county agents in the territory it serves, urging the wet corn to be treated with salt at the rate of one barrel of salt to a thousand bushels of corn. This practice has been tried out in other years, and the results have proved satisfactory in every way. The Burlington also gives preference to cars loaded with corn, to reduce damage to the crop while it is waiting for shipment.

AUSTRALIAN TRANSCONTINENTAL LINE COMPLETED

The first east-and-west transcontinental railway in Australia was recently completed when a new line was opened from Port Augusta, South Australia, to Kalgoorlie, West Australia, 1,053 miles. At the latter point the new road connects with the West Australian line from Perth on the Indian Ocean coast and at Port Augusta it joins the South Australian railway to Adelaide. A recent article in the "Railway Gazette," London, contains a description of the new road based upon a letter from Perth, giving an account

only, and the intervening unconstructed gaps being covered by motor car (90 miles) and by carriage (24 miles).

Mr. Lynch was of the opinion that by the time the line was properly ballasted and brought up to the high speed standard the cost would reach £7,000,000 sterling (\$34,000,000), or more, as against an original estimate of about £4,000,000 (\$19,000,000.) From Kalgoorlie the line runs through a fine belt of timber for 70 miles, after which it passes through a lighter timber belt and enters a large area of limestone plains, 450 miles in width. In that stretch there is 309 miles of straight line running through a tremendous sweep of open country with nothing to relieve the eye but blue bush, salt bush and other native shrubs.

The minister expressed satisfaction with the rate of progress, but believed that if ordinary foresight had been exercised at the outset the railway would long since have been completed. Although the line traverses practically 1,000 miles of dry country and it was essential that an adequate water supply be secured, this all important provision was neglected and 90 per cent of the delays which occurred later were due to this cause. At present condensers are being employed to obviate this difficulty, but steps are being taken to secure a reliable water supply throughout the entire line.

The transcontinental road is designed for high speed traffic with the expectation that it will prove practicable to make the journey between Port Augusta and Kalgoorlie in about 24 hours, or at an average speed, including stops, of 44 miles per hour. The line will not, however, be fully ballasted for some time, and consequently it is estimated that the average speed cannot exceed 30 miles an hour, permitting an average time of 35 hours for the trip between Port Augusta and Kalgoorlie. The rails weigh 80 lb. per yd. and are 40 ft. in length. The original intention was to use 70-lb. rails 33 ft. long, but the weight was changed in order to permit higher speeds, while the length was altered to save joints.

Owing to war conditions it has been impossible to secure the requisite material to build equipment suitable for the country traversed by the new line, which is warm in summer and cold in the winter months. For immediate purposes wooden bodies of the best design practicable will be built on such car underframes as are available in the Commonwealth. This equipment will consist of first and second-class sleeping cars, dining cars, day coaches and mail and baggage cars.

There will be 20 intermediate stations on the new road where postal, money order, savings bank and telegraphic business will be done. The line will be worked by the electrical staff, divided into 38 sections.



Location of the New Line

of an official journey made over the Australian Trans-Continental Railway when all but 114 miles had been completed. This trip was undertaken by a large party of members of the federal and Western Australian parliaments and government officers, including Hon. P. J. Lynch, Federal Minister of Works and Railways, and J. J. Poynton, Director of Transport. The through trip from Perth to Port Augusta took five days, the party travelling by daylight

TRAIN RESTRICTIONS ON ITALIAN RAILWAYS.—Owing to scarcity of coal on the Italian State Railways, it was decided to cancel 173 trains commencing with November 25.

NEW TYPE OF LOCOMOTIVE IN NEW ZEALAND.—A new type of locomotive has been employed on the Woodville-Taihape section of the Main Trunk Railway of New Zealand during the past three months. The first of the class was constructed at the government workshops at Dunedin for service on the Canterbury Plains some two years ago. When tried over the level country between Christchurch and Oamaru the new engine gave such excellent results that it was decided to try it over the sharply graded section between Oamaru and Dunedin, and there again it satisfied all tests. Four of the new engines were sent to North Island some months ago and have been employed on the Wellington-Taihape section with good results. It appears that this engine can travel farther than the compound engine without taking in water, and that it has a greater hauling capacity.

—Commerce Report

HEAVY LOADING OF COTTON

The Southern Pacific, Texas lines, is securing maximum carloads of cotton by the use of a small derrick and horse in loading. The flat car shown in the photographs which was originally fitted for the hauling of lumber, was loaded



Car Loaded with 86 Bales of Cotton

in this instance with 86 bales of flat cotton. The pictures were taken at Mabank, Tex., on November 28, 1917. In another instance a 50-ft. flat car was loaded with 110 bales



Carload of Cotton Bales in Process of Loading

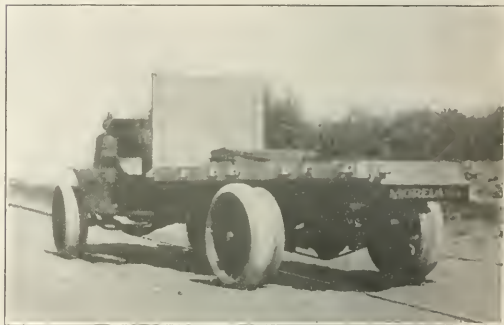
of uncompressed cotton without the aid of derrick and horse.

We are indebted to F. M. Lucore, assistant general manager of the Southern Pacific, Texas lines, for these two photographs.

RAILWAYMEN AT THE FRONT.—There are leagues of narrow-gage railways serving the British armies in Flanders and France. These are largely in the hands of Canadian and American railwaymen who have had special training. These railways are helping to beat the Germans, who never expected that the Allies would bring field transportation to such a high pitch of efficiency. The adaptability of the North American has made him invaluable as a railway pioneer at the front. In some sections the railways abandoned by the retreating Germans have been turned to good use against the enemy after suitable changes in gage. The "Sammies" on the firing line, under General Pershing, are not the first draft to reach the front. For more than two years American railwaymen have been running the risks of war, repairing and constructing railways under fire. So risky is this work that some of them have volunteered for the front trenches, preferring fighting risks to the fortunes of war on a railway section. Men from Ontario, Northwest Canada, and the United States have done a magnificent work as railway men.—*Toronto Globe*.

MORELAND AUTO-RAIL TRUCK

The automobile has become such an important factor in the trucking business in the Imperial valley of California that the Holton Interurban Railroad found that its business was falling off. The fact that the automobile would take material directly from the ranches to the market made it much more desirable for the farmers to use this service, as it eliminated the haul from the ranch to the freight station on the railroad. To meet this situation, W. F. Holt, who controls the Holton Interurban equipped a standard 2½-ton Moreland distillate truck with a motor truck wheel,



The Truck Leaving the Highway for the Railroad

designed by himself, which has steel flanges on the inner side and a solid rubber truck tire of larger diameter than the metal flanged portion, on the outer side in order that the truck can be used on rails as well as on the road, as the illustrations indicate. It is a simple matter for the car to mount the rails at any road crossing.

After the truck wheels are in place on the steel rails they



Auto-Rail Truck Mounted on the Rails

are locked rigidly by a special brace, a patent for which has been applied for by Mr. Holt. The truck operates on regular schedule time and maintains a speed of about 40 m.p.h. The difficulty of crossing switches and frogs has been overcome by still another device which is being patented.

WAR HONORS FOR BRITISH RAILWAYMEN.—Thirty-three men employed by the London, Brighton & South Coast Railway have been awarded war honors and decorations on active service.

General News Department

The Delaware, Lackawanna & Western has made an increase of 10 per cent in the pay of clerks in the auditing and car record departments. The Pennsylvania has made an advance in the pay of telegraphers, said to be of benefit to more than 1,000 men.

On the Buffalo, Rochester & Pittsburgh during Christmas week all agents, conductors and station and train baggagemen were instructed to accept U. S. Mail presented by the post office department at any station, on any train, and carry it to destination or junction point regardless of space or territory authorized.

Near Ruston, La., on December 23, a man named Causey flagged a passenger train of the Vicksburg, Shreveport & Pacific, brought it to a stop, and at once went into a coach and killed a passenger, against whom he had some grievance; and seriously wounded another man. At the next station Causey got off and surrendered to the sheriff.

William A. Christian, senior civil engineer, and T. E. Laist, senior architect, of the Division of Valuation, of the Interstate Commerce Commission, Central district, Chicago, have received commissions as majors in the engineering corps of the United States army. J. M. Kemmerer, office engineer at Chicago, has also received a commission as captain in the engineers corps.

At Magnolia, Md., on the Philadelphia, Baltimore & Washington, on the evening of December 22, six men waiting for a train were pushed by the crowd from the station platform on to the track and were killed by an express train. The crowd, a large one, consisted of contractors' employees who had been working for the government near Aberdeen and were waiting for a local train.

Of the 102 locomotives recently ordered sent from western lines to eastern roads to relieve the districts congested with freight, 39 were delivered at Chicago and 7 at St. Louis by December 21, 26 were en route at that time and 30 had not yet started for their destination. The expectations were that all of the engines would be delivered by December 25, except a few which are being transformed from coal to oil burners.

The Grand Trunk Literary and Scientific Institute is now 60 years old, and recently celebrated its anniversary. It was organized by F. H. Trevelthick, a member of the distinguished family which included Richard Trevelthick, who made the first high pressure steam locomotive. F. H. Trevelthick, when he founded the institute, in 1857, was locomotive superintendent of the Grand Trunk. This movement led to the establishment of Grand Trunk Railway libraries at London, Stratford, Belleville, Lindsay and Battle Creek. The libraries are supported in part by a fund given to the railway company for that purpose, in 1860, by the Prince of Wales (King Edward).

Agnew T. Dice, president of the Philadelphia & Reading, has issued a call to employees of that road to stand by and do their share to the utmost. It speaks of the vital importance and urgent need of operating the road with the greatest possible efficiency and continues: "This result can be gained only through the giving by each man of the most efficient service of which he is capable. Railroad men may naturally be expected to set an example for other workers, and I am sure that each and every one of you will feel it to be a patriotic duty to lose no time from work and to give his best service of head, hand and heart. . . . Let every man feel that it is his patriotic duty to work and to co-operate with his fellows to the limit of his ability. Let us all face our difficulties with the determination to overcome them. . . ."

Officers of the Southern Pacific, testifying at an inquiry held by the California State railroad commission, recently said that the company had done its utmost to provide for the transportation needs of the public. Ten new locomotives have recently been delivered; ten more are being built in the company's shops, and others have been leased and borrowed. The company is

building 3,200 cars in its California shops and has had 10,481 skilled workmen employed in maintenance of equipment work. It could use 500 more men if they could be found. F. E. Bator, general passenger agent, said as war broke out the company called meetings on all its divisions to see if any unnecessary passenger service could be eliminated, and it had been found that all of its trains were needed by the public, that the expeditious moving of the country's man power in time of war was as necessary as the prompt handling of freight, and that any attempt to lengthen the schedules of fast overland trains, such as the Overland Limited, would be interfering with the expeditious handling of Government mail, and a delay to business men.

The United States Fuel Administration has announced that it will not permit local officers to confiscate coal to meet local needs. The authority to commandeer and divert coal will be retained entirely in the hands of officers of the Fuel Administration. Director of Charities William Krusen, of Philadelphia, who used four cars of coal for local distribution without consulting the state fuel administration has been notified that further confiscations will not be permitted; and that they are unnecessary, provided he will advise the Washington office. At Toledo, Ohio, Judge John M. Killits, in the United States District, took similar action in a similar case. It was a suit of the Baltimore & Ohio against the Mayor of Lima. The temperature at Lima fell to 10 deg. below zero and the city took some cars from trains passing through. Judge Killits said: "Such officials ought to be taught to respect the law. They should come down off their high pedestals. They should try to cultivate amiable relations with the railroads. Their acts impede efforts to solve the coal distribution problem and thwart the railroads in their work of contributing coal where it is most urgently needed."

At Macon, Ga., recently a board of arbitrators decided in favor of the reinstatement of a locomotive engineer of the Georgia, Florida & Alabama who had been dismissed and whom the brotherhood demanded should be taken back, and a few days later the railroad company filed in the United States District Court a bill, taking exceptions to the findings of the board. The bill of exceptions avers that the arbitrators were without jurisdiction to hear and determine the issues and that the federal district court in which the bill is filed is without jurisdiction to render any judgment based on the award because the act of July 15, 1913, which authorizes mediation between railroads and their employees, does not cover the case in question. Strickland was not an employee of the road at the time of arbitration and even had he been, it is contended, the mediation act would not have applied in the case since this act is designed to cover only cases where matters of wages, hours of work and conditions of employment are concerned. Strickland, it is alleged, was discharged for infractions of the rules of the road and so the case in question is not among those provided for in the mediation act. Strickland was discharged by the road on August 5, 1914. The unions demanded his reinstatement, and in October an arbitration agreement was signed. Stanton J. Pelle, F. A. Burgess and J. C. Hale were the arbitrators.

Trolley Car Disaster at Pittsburgh

In the derailment of a street car at Pittsburgh, Pa., December 24, at the foot of a steep descending grade, 19 passengers were killed and 80 or more were injured. The car became uncontrollable just after entering the tunnel, about a mile long, leading from the South Side at the center of the city, and ran uncontrolled to a curve at Carson street at the lower end of the tunnel.

Hearing on Railway Situation

The Senate Committee on Interstate Commerce has announced a hearing on Saturday on the railroad situation. The members of the Interstate Commerce Commission are expected to be the first witnesses.

Engineers Wanted for the National Army

The War Department announces that volunteers are now being accepted for a provisional reinforcement railway regiment, for the National army, which is being organized at Camp Grant, Rockford, Ill. Men are wanted who have qualifications in railway construction, operation and maintenance; shop work and transportation. Applications are received at all of the principal recruiting stations.

Freight by Automobile from Detroit to Newport News

The train of 33 automobile freight trucks which is being run by the War Department from Detroit, Mich., to Newport News, Va., to facilitate the movement of government freight, delayed by the congestion on the railroads, and also as a means of training soldiers in the management of this kind of transportation, has made thus far about 50 miles a day; in other words, has accomplished about the speeds that were planned. The best day's run was 65 miles. In northwestern Ohio much snow was encountered. Near Warren, Ohio, on December 19, about 1 a. m., one of the trucks was wrecked at a crossing of the Erie Railroad, being struck by a passenger train and one of the two men in charge was killed. The other was badly injured.

Curtailment of Use of Private Cars

In compliance with the request recently made by the Railroads' War Board that the use of private and official cars be curtailed as much as possible during the war, Henry C. Frick, one of the largest railroad stockholders and a director of the Pennsylvania and the Atchison, Topeka & Santa Fe, has ordered his private car, the "Westmoreland," dismantled and laid up for the duration of the war. The War Board has since requested the presidents of the Trunk Line roads to withdraw the tariffs covering the movement of private passenger cars.

\$250 for the Railway Regiments' Tobacco Fund

The Railway Regiments' Tobacco Fund received another big boost last week when the New York Railroad Club, on the motion of Daniel M. Brady, voted to give \$250 to the fund, \$250 to the Y. M. C. A., \$250 to the Knights of Columbus and \$250 to the Red Cross.

Other contributions were received last week as follows:

American Car & Foundry Company, New York, \$50; Damascus Brake Beam Company, Cleveland, \$25.

Iowa Defense Council Praises Railways

The Iowa State Council of National Defense has issued to shippers and receivers of freight a circular commending the patriotism of the officers of the railroads who have released many of their best employees to go to France and Russia and have also organized from their employees companies of engineers for service abroad. The circular says: "They have co-operated in every way with each other, diverting business from the companies which could obtain it to the companies which could handle it most efficiently. They have sought to attain the greatest degree of efficiency in transportation for the benefit of the country, regardless of the effect upon the individual companies. Their credit has been so greatly impaired that they cannot borrow money except at ruinous rates, but they have nevertheless greatly increased the amount of their transportation of passengers and freight. . . ."

Christmas on the N. C. & St. L.

President John Howe Peyton of the Nashville, Chattanooga & St. Louis, has issued a Christmas greeting to the employees in which he says:

"The joyous Christmas-tide is again at hand, and we should all remember that it is the annual reminder to all the earth that Christ, the Son of God, chose at this season to be born in the form of humanity, in order that He might work out the salvation of our race. With the whole earth at war this is no time for merriment, but I can and I do wish you all a 'happy' Christmas. Happiness is only possible to those who try to do their duty to God and men. . . . The future of our nation, and of the whole human family, is threatened with great suffering

and privation. We will meet the emergencies like true men, and we will do our duty at any cost. We must, each and all, volunteer for the war. Some of us must become soldiers and offer our lives to preserve liberty upon the earth. Some of us must sacrifice our leisure to produce more food, and all of us must economize by consuming less food. All of us must sacrifice our pleasures in order to save money to loan to the government. Let us rejoice because Christ was born in Bethlehem nineteen hundred years ago, and let us imitate Him by sacrificing ourselves for the cause of liberty, justice and righteousness upon the earth."

Cresosote Oil Imports

The imports of cresosote oil in the United States during the fiscal years ending June 30, 1916, and 1917, as compiled by the Bureau of Foreign and Domestic Commerce, were as follows:

Source	1916		1917	
	Gallons	Value	Gallons	Value
England	34,616,238	\$2,763,078	25,782,272	\$1,920,446
Scotland	505,346	62,285	206,012	30,270
Canada	3,746,192	272,273	3,089,754	233,853
Japan	1,630,616	109,144	.....	.....
	40,498,392	\$3,206,780	29,078,038	\$2,184,569

From these figures there is shown a decrease of 11,420,354 gal., the larger part of which results from the heavy falling off in importations from England and the suspension of shipments from Japan. The average invoiced value of all cresosote importations last year was 7.2 cents per gal. as compared with 7.9 cents in 1916.

Grand Trunk Safety Bulletin

The Safety Engineer of the Grand Trunk issues his December bulletin (No. 15) with decorations of holly and other embellishments; and illustrates one of his chief points by a picture of a barrel tipping over the brink of Niagara Falls. In this connection he says:

"Would you go over Niagara Falls in a barrel? *I should say not.* That's a funny question to put into a Safety Bulletin. What are you driving at anyway? *Just this.* Scores of you men every day are taking chances that are just as unnecessary, just as foolish and just about as risky as going over Niagara Falls in a barrel; and if you could read the reports in my office showing how Grand Trunk men get injured and killed, you would agree with me."

The introduction to the bulletin reads

You fellows who have never been hurt—and who probably think you never will be—go to look on this "safety first dope" as good stuff for the other fellow—you are the individuals this Bulletin is aimed at. I want you to quit flirting with Carelessness and get into the Safety Corral before your name comes floating into my office on one of those long pink sheets.

The safety engineer finds that three causes alone are responsible for more deaths to Grand Trunk men than all other causes combined: (1) Run over by cars or engines; (2) Falling from cars or engines; (3) Train or yard men working on cars which are moved by another engine working on same track.

Individual Christmas Boxes Sent to Railway Men in France

With contributions by employees of the Illinois Central, the Yazoo & Mississippi Valley and the Chicago & North Western individual Christmas boxes were sent to former employees of those roads now in active military service in France. Charles H. Markham, president of the Illinois Central system, addressed a personal letter to each Illinois Central soldier in France, sending it with the box. Every box contained the following articles: One box of cigars, 20 packages of cigarettes, 20 packages of cigarette papers, 20 boxes of smoking tobacco, one pound of chewing tobacco, one automatic cigar or cigarette lighter, one pipe, one package of pipe cleaners, two tooth brushes, two packages of tooth paste, five pounds of candy, three bars of soap, 10 packages of chewing gum, three pairs of woolen hose and one woolen vest.

The North Western Christmas boxes were purchased, packed and sent at an expense of \$1,247. There still remains a balance of \$3,895 of the fund contributed by employees and officers of the company. Each box which was sent to members of Company F of the Thirteenth Engineers, the North Western unit in France, contained one pound of assorted candy, one package of mints, three packages of gum, six packages of licorice, one pipe.

200 cigarette papers, 12 pipe cleaners, 20 packages of smoking tobacco, one pound chewing tobacco, 10 packages of cigarettes, 25 cigars, one indelible pencil, one cigar lighter and a set of writing tablets and envelopes. In addition, a box for general distribution was sent to the company containing baseball equipment, 40 decks of cards, 48 puzzles, 12 mouth organs, four yearly subscriptions to the *Railway Age Gazette* and a miscellaneous assortment of magazines.

Mr. Markham's letter expressed the pride felt by the men at home in their co-workers' response to the call of their country, and confidence that "any task which may be assigned to Illinois Central and Vazoo & Mississippi Valley men will be promptly and efficiently performed."

Appeal to Lehigh Valley Employees

E. E. Loomis, president of the Lehigh Valley, has issued a letter to employees suggesting that possibly they do not realize what a necessary factor the railroads are in the winning of the war. "They are literally the backbone of the men in the American camps and the French trenches. Without their faithful service, the courage and endurance of the bravest troops become useless. This is so true that railroad men unwilling at this time to give to their work the best that is in them, are actually slackers. . . . *There must be no slackers among us. Every man must stick to his job in these troublesome days. It is a time for self-sacrifice. This means working thirty days a month, if necessary, regardless of weather conditions; losing no time after pay day; assisting, each in his place, in running this railroad at the highest point of efficiency. . . . I call upon you all to enlist heart and soul in this patriotic service.*"

Coal Production

According to the weekly bulletin of the Geological Survey, zero weather and a heavy fall of snow impeding railroad traffic and surface operations at the mines caused coal production during the week ended December 15 to drop to the lowest point recorded since the weekly bulletins were begun. The average daily production was 1,402,594 tons. The lowest mark reached before since June 1 was 1,638,513 tons, in the week ended August 18, at the time of the coal strikes in Illinois and the southern Appalachians. Anthracite shipments fell off 22 per cent. Bituminous shipments originated on 114 roads amounted to 147,590 carloads. The percentage of full time output produced during the week ended December 8 was 73.6 and 19.3 per cent of the loss was attributed to car shortage. The bulletin says:

"Illinois and Indiana exhibited little change. In Ohio, losses due to no cars increased from 25.2 to 31.7 per cent of the full-time capacity. Conditions in western Pennsylvania, on the other hand, improved greatly. In central Pennsylvania, losses due to inadequate transportation increased. On the West Virginia fields, the Panhandle, Fairmont, and Cumberland-Piedmont experienced relief from the shortage of the week before. In the remaining fields, losses due to car shortage were even more severe than during the preceding week; in the high-volatile field of southern West Virginia, particularly, they amounted to 56.9 per cent of the full-time output.

"A study of these bulletins will reveal that the dominant factor limiting production is lack of transportation. As long as the soft coal mines of the country are idle from one-seventh to one-fifth of the time because there are no cars at the tipple, more laborers could add but little to the output. It should, however, be remembered that the railroads are already carrying more coal than ever before in the history of the country. The production of bituminous coal during the month of November was, with one exception, the largest in any one month in the history of bituminous coal mining in America."

The monthly bulletin of the Geological Survey for November gives a preliminary estimate of the output for that month of 47,747,000 net tons. The average production per working day during the month was 1,872,432 tons, as compared with 1,757,336 tons in October. The November rate has been exceeded only once in the last two years, when in February, 1916, the average production per working day rose to 1,882,771 tons.

The cumulative production from January 1 to November 30, 1917, came within 427,000 tons of equalling the entire 1916 output. Up to November 30, 1917, the country is estimated to have pro-

duced 502,691,000 tons. The entire output of the year 1916 was 502,519,000 tons. The country may thus be said to be one month ahead of its 1916 performance. If the present rate of production be maintained, the total output for 1917 will better the record of 1916 by 9 per cent.

A. W. Thompson, chairman of the General Operating Committee of the Eastern Railroads has been co-operating actively with the Fuel Administration to promote an increased movement of coal and recent reports have indicated a marked improvement in some districts.

Railway Returns for October

The Interstate Commerce Commission has issued its monthly bulletin of railway earnings and returns for October. Railway operating revenues for the month amounted to \$380,951,970 as compared with \$338,666,230 in October, 1916. Operating expenses increased from \$210,295,841 to \$259,017,248. Taxes increased from \$13,898,678 to \$21,910,588, so that the railway operating income was only \$99,526,889 as compared with \$114,431,497 in October, 1916, a reduction from \$495 to \$432 per mile of line. The operating ratio was 67.59 in October, 1917, as compared with 62.10 in October, 1916. The railroads in eastern, southern and western districts all show increases in operating revenues for the month and decreases in the operating income. In the case of the eastern roads, the reduction in the latter item amounted to nearly \$7,000,000, and in the case of the western lines to over \$7,000,000, while for the southern lines it was about \$100,000.

For the ten months ended with October, railway operating revenues amounted to \$3,350,721,651 as compared with \$2,991,462,057. Railway operating income was \$835,377,303 as compared with \$899,792,922, a reduction of nearly \$300 per mile. The operating ratio was 69.87 as against 65.52. For the 10 months the eastern roads show a reduction of \$62,000,000 in operating income, the southern roads show a gain of nearly \$2,000,000 and the western roads show a loss of over \$4,000,000.

A notable feature of the report is the increase in passenger revenues, which for October was \$15,000,000 or nearly 20 per cent. For the 10 months passenger revenues increased approximately \$90,000,000 or 15 per cent, while the freight revenues increased about 10 per cent.

Inefficient Watchmen

From an address by General Manager Mallahan, of the National Board of Fire Underwriters at a recent convention in New Orleans we take the following observations on the danger of retaining superannuated employees.

The custom among manufacturers, warehousemen and others is that of engaging as night watchman some superannuated employee who is no longer physically able to earn a workman's pay. The amount of real protection which he furnishes, especially in war time, is very small. Generally he can be avoided with ridiculous ease by any one who is in the place with hostile intent. In a recent test in a large grain elevator, six inspectors were sent into the plant at night time, without the knowledge of the aged watchman, and they spent six hours within the plant and made drawings of many of its important features, but their presence was never once detected. As a consequence the owners were given the alternative of engaging a sufficient number of young and vigorous guards or of having their plant taken over by the state authorities.

The big Baltimore fire of October 30 is a striking example of insufficient watchman service. Here was a pier, 900 feet long, containing a valuable accumulation of freight, left in the sole charge of a single watchman! To make the safeguarding of our production of war supplies depend upon those who can furnish only nominal safety, during the hours when darkness brings the greatest dangers, would be ludicrous if it were not so grave. It is equivalent to locking the windows and leaving the front door open. Watchmen should be picked men, not derelicts. They should be intelligent, courageous and physically active. They should be sufficient in number to furnish real protection. They should be armed. They should be trained in knowledge of fire alarms, fire prevention and fire protection. They should never be engaged except upon unmistakable evidence of character, and they should be paid the salaries that will command such qualifications.

The Wood Preservers' Convention

At a meeting of the executive committee of the American Wood Preservers' Association in Chicago on December 17, it was decided to proceed with the original plans for the fourteenth annual meeting of that association, which will be held at Chicago on January 22 to 24, inclusive. The advisability of postponing this convention or of omitting it entirely this year was given careful consideration, but it was decided that the importance of the conservation of timber and the unusual character of the new problems presented to this industry by the war made the exchange of information more than usually desirable. It was decided to limit entertainment to an informal dinner on Wednesday evening, which will be patriotic in character.

The tentative program so far as has been arranged is as follows:

TUESDAY MORNING.

Convention called to order at 10 a. m.

President's address.

Reports of committees.

Report of secretary-treasurer.

Communications.

TUESDAY AFTERNOON.

Report of Conference Committee.

Report of Committee on Publicity, Promotion and Education.

Report of Committee on the Purchase and Preservation of Treatable Timber.

WEDNESDAY MORNING.

Report of Committee on Service Tests.

(a) Ties and Structural Timber.

(b) Flooring and Paving.

Report of Committee on Plant Operation.

Report of Committee on Preservatives.

WEDNESDAY AFTERNOON.

Report of Committee on Wood-Block Flooring and Paving.

Report of Committee on Non-Pressure Treatments.

Motion Picture Exhibit of the Manufacturing of Iron Pipe.

WEDNESDAY EVENING.

Annual Dinner.

THURSDAY MORNING.

Report of Committee on Terminology.

Report of Committee on Publications.

Closing Business.

Election of Officers.

In addition to the reports of committees arrangements are being made for a number of prominent men in the field of timber preservation to present individual papers upon important problems in this industry which are now of special interest.

A. R. E. A. Nominations

The nominating committee of the American Railway Engineering Association has nominated the following candidates for officers in that association for the ensuing year:

President, C. A. Morse, chief engineer, Chicago, Rock Island & Pacific, Chicago.

Vice-president, H. R. Safford, chief engineer, Grand Trunk, Montreal, Canada.

Treasurer, Geo. H. Bremner, district engineer, Division of Valuation, Interstate Commerce Commission, Chicago.

Secretary, E. H. Fritch, Chicago.

Directors (three to be elected): J. L. Campbell, engineer maintenance of way, El Paso & Northwestern, El Paso, Tex.; J. E. Crawford, chief engineer, Norfolk & Western, Roanoke, Va.; J. M. R. Bairbairn, assistant chief engineer, Eastern Lines, Canadian Pacific, Montreal, Canada; E. A. Frink, principal assistant engineer, Seaboard Air Line, Norfolk, Va.; John V. Hanna, chief engineer, Kansas City Terminal, Kansas City, Mo.; E. H. Lee, vice-president and chief engineer, Chicago & Western Indiana, Chicago, Ill.; H. T. Porter, chief engineer, Bessemer & Lake Erie, Greenville, Pa.; E. B. Temple, assistant chief engineer, Pennsylvania Railroad, Philadelphia, Pa.; F. E. Turncaure, dean, College of Engineering, University of Wisconsin, Madison, Wis.

Members of nominating committee (five to be elected): J. E. Crawford, chief engineer, Norfolk & Western, Roanoke, Va.; Arthur Crumpton, assistant valuation engineer, Grand Trunk, Montreal, Can.; B. J. Dalton, chairman valuation committee, Missouri, Kansas & Texas, Parsons, Kan.; H. T. Douglas, Jr., chief engineer, Chicago & Alton, Chicago; John V. Hanna, chief engineer, Kansas City Terminal, Kansas City, Mo.; A. J. Himes, valuation engineer, New York, Chicago & St. Louis, Cleveland, Ohio; J. B. Jenkins, valuation engineer, Baltimore & Ohio,

Baltimore, Md.; J. A. Peabody, signal engineer, Chicago & North Western, Chicago; A. R. Raymer, assistant chief engineer, Pittsburgh & Lake Erie, Pittsburgh, Pa.; J. E. Willoughby, chief engineer, Atlantic Coast Line, Wilmington, N. C.

Association of American Railway Accounting Officers

The Standing Committee on Freight Accounts, in view of the shortage of man power on account of the war, and as a means of relieving the congestion in local agencies and in audit office settlements among carriers, has recommended the establishment of a \$1 minimum; in other words the committee recommended that the association's 25-cent correction minimum be changed to read items of less than \$1.

No June Mechanical Conventions

At the meeting of the executive committees of the Master Car Builders and the American Railway Master Mechanics' Associations in New York December 20, it was decided in view of the present state of affairs to hold no convention in June, 1918. If conditions warrant, however, a business meeting may be held in Chicago sometime during the year.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meetings of those associations which will meet during the next three months. The full list of meetings of associations published only in the first issue of the Railway Age Gazette for each month.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next annual meeting, March 20-22, 1918, Chicago.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, Supt. Timber Preservation, B. & O. Mt. Royal Sta., Baltimore, Md. Next convention, January 22-24, 1918, Hotel Sherman, Chicago.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Morrison Hotel, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CINCINNATI RAILWAY CLUB.—H. Boulet, Chief Interchange Inspector, Cincinnati, 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 568 Union Arcade Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, 149 Peoples Gas Bldg., Chicago. Annual exhibition, March 18-21, 1918, Coliseum and Annex, Chicago.

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

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Geo. A. J. Hochgrebe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PACIFIC RAILWAY CLUB.—J. S. Woolver, Assistant to Chief Engineer, Northwestern Pacific R. R., San Francisco, Cal.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria, Ill.

RAILWAY CLUB OF PITTSBURGH.—J. R. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial Annex Hotel, Pittsburgh.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next meeting, March 18, Chicago.

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

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.

TRAFFIC CLUB OF CHICAGO.—C. B. Singer, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 1st Monday in month, except June, July and August, Hotel Sherman, Chicago.

WESTERN SOCIETY OF ENGINEERS.—Edgar S. Nethercut, Secretary, 1735 Monadnock Block, Chicago, Ill. Regular meeting, first Monday in month, except January, July and August. Extra meetings generally on other Monday evening except in July and August.

Traffic News

The Central Passenger Association roads will discontinue deliveries of passenger and sleeping car tickets to patrons, beginning January 1.

The embargo which was placed on the movement of corn, oats, kaffir corn and milo maize into and east of Chicago on December 5, was canceled on December 20.

The Wabash will on December 30 discontinue its passenger train leaving St. Louis for Chicago at 9:01 a. m. and the train leaving Chicago for St. Louis at 9 a. m.

The Chamber of Commerce of Houston, Tex., has established a bureau, in charge of F. A. Leffingwell, to aid shippers and consignees in securing prompt adjustment of overcharges and other claims against railroads.

The Delaware, Lackawanna & Western has filed with the Interstate Commerce Commission a tariff making an increase of 10 cents a ton in the freight rate on small sizes of anthracite coal from the mines to Tidewater.

The Delaware, Lackawanna & Western announces in New York City that some of the suburban passenger trains in the non-rush hours will be discontinued December 31, and the consequent saving in coal is estimated at 1,000 tons a month.

Union Pacific has announced that hereafter it will pay refunds to passengers on its extra fare train between Chicago and San Francisco at the rate of a dollar for each hour the train is late when the train is two hours or more behind schedule. No refund will be paid exceeding 50 per cent of the extra fare.

The New York, New Haven & Hartford, during the eleven months ended November 30, moved 390,505 tons more of commercial coal over its lines than in the same period of 1916. Of this increase the larger part was anthracite. Total movements for eleven months were 6,437,974 gross tons, compared with 6,046,469 gross tons in 1916.

The United States Food Administration announces that Lester Brothers, wholesale food handlers of Newport News, Va., have been deprived of their license, and ordered to close their doors on December 31. They had refused consignments of potatoes, allowing them to deteriorate in the freight yards and incidentally to add to railroad congestion.

The Southern Railway early in January will send its live stock and dairy instruction cars for a tour over the line in Georgia between Macon and Brunswick. Agricultural agents of the road's development service will be assisted by representatives of the state department of agriculture. The subjects to be treated will include horticulture, methods for the control and extermination of the boll weevil, and information on the growing of fruits and vegetables and forage and pasture crops.

The Secretary of War, in a public statement announcing that camp commanders had been told to discourage the granting of unusual numbers of furloughs to the soldiers at holiday time, says that the principal reason is that the transportation facilities of the country were taxed to their utmost for weeks in bringing to the mobilization points the hundreds of thousands of men now there and in making the necessary transfers of men and materials between those points. "To add to the burden of carrying great numbers of these men to their homes from the camps and back again to the camps would be a burden insupportable," he said. "The relieving of the railroads from this burden will enable us by so much to concentrate our energies and capacities for the transportation of our resources to the seaboard and to the battlefield in France."

At the suggestion of the traffic officers of the southeastern lines at a recent conference, the Railroads' War Board has appointed a committee, to be known as the South Atlantic and Gulf Export Committee, for the purpose of co-operation with the authorities of the United States and allied governments in the movement of traffic exported directly or indirectly via South Atlantic and Gulf ports. The committee consists of C. T. Airy,

Central of Georgia, chairman; R. A. Brand, Atlantic Coast Line; F. B. Bowes, Illinois Central; C. R. Capps, Seaboard Air Line; Lincoln Green, Southern; A. K. Smith, Louisville & Nashville, and W. A. Winburn, Central of Georgia. The chairman is to act as traffic manager, with headquarters at Washington, to make such distribution of the freight as will prevent congestion. The organization of a similar committee for the management of freight through Texas ports has been suggested.

Embargo on Corn and Oats Lifted

United States Food Administrator Hoover has notified corn and oats millers in the central and eastern states—east of Wisconsin and Indiana and north of the Potomac and Ohio rivers—that the zonal embargo on the shipment of corn and oats into or through that territory, which went into effect on December 8, is being taken off. Corn and oats users are urged not to buy or ship more corn or oats than they can at once discharge and not more than requirements from week to week until congestion is relieved. Otherwise railways may be forced to place special embargoes on plants at fault in this particular.

The Example of the Dining Cars

The railway dining car services of the country have reported to the United States Food Administration that during the months of October and November they saved, of

Meats	234 tons
Wheat flour	1,214 bbls
Sugar	12½ tons

These savings were made despite an increase of twenty per cent in the number of persons fed, as compared with the corresponding two months of the previous year.

Railroads Urge Curtailment of Christmas Travel

The Pennsylvania and the Southern last week advertised in the daily papers appealing to people not to travel during the Christmas holidays, except there be urgent necessity. "To the end that the soldiers on furlough and persons who must travel may do so with a minimum of inconvenience." The advertisement says:

"Every year the normal travel is greatly increased during the holiday season. This year it will be swelled by the return to their homes for Christmas of a large number of the troops now in camp. Furthermore, an extraordinary current traffic in military supplies, fuel and necessary commercial freight may be expected, during the holidays, to limit our ability to provide comfortable passenger transportation."

The Southern has also announced the curtailment of New York sleeping car service, noticed on December 14, page 1102, and says that some of its through trains will not be held at Washington for connections from the east, but will depart on time, and will be limited to their present capacity.

KEEPING TRAINS FROM BEING BLOWN OFF TRACKS.—There is a stretch of railway along the west coast of Ireland where it was formerly not an uncommon occurrence for the trains to be blown from the rails by the winds from the ocean, says the Popular Science Monthly for December. These disasters are now prevented by the use of an ingenious form of anemometer which rings an alarm bell when the velocity of the wind reaches sixty-five miles an hour. Each station on the line keeps on hand a stock of movable ballast, a ton of which is placed aboard every car arriving at the station after the bell sounds.

RAILWAY FACILITIES AND INCOME.—Increased railway facilities are a personal necessity to many of us; they are a national necessity. We need both tracks and equipment vastly in excess of the present supply. This is not a time to debate as to the best source of money for supplying railway needs, the return on the investment, etc. We know that the railway should be in a position to pay the same rate of interest on the money it requires as would any business of equal safety or risk, no matter from what source it borrows. The railways are not paying that interest now and can only and should only get capital when they can vouch for an adequate return. An increase of income is the *sine qua non* of the present railway situation. *Engineering and Mining Journal.*

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The Commission, Division No. 2, has issued an order providing that railroads may file tariff publications covering changes in the dimensions, capacity and number of cars, substitution of new cars for old and corrections in the number, capacity or dimensions of cars without formal hearing. The commission says that these changes are of almost daily occurrence and it is important that shippers be advised of them promptly.

The commission, on December 20, announced the suspension until June 30, 1918, of the tariffs involved in the eastern commodity rate case. These rates were suspended on August 28 until December 30, and have since been consolidated with the supplemental 15 per cent case, in which the decision has not yet been rendered. The further suspension of the rates would seem to indicate that the commission does not expect to issue a decision in the 15 per cent case before December 30.

Private Car Investigation Reopened

The Interstate Commerce Commission has announced the reopening of its investigation of the relations between railroads and shippers and private car lines, which was begun in 1913, but in which no report was made. The commission says that conditions have undergone material changes, and it is advisable that the evidence and statistical data heretofore submitted be brought down to date. It is proposed also to secure such further evidence as may be necessary to show the relation between private car companies and rail carriers; to determine whether it is proper, where special equipment is supplied by carriers, that a service charge, in addition to the rate of transportation, be assessed; and the amount of such charge if one is to be made; and to ascertain in case a carrier has no equipment of the kind demanded by a shipper, whether it should secure the same, or whether the shipper should be permitted to make his own arrangement.

The inquiry will further consider (a) whether if private car owners are to be permitted to continue to furnish cars and make charges direct to the shipper, a tariff should be filed.

(b) What compensation should be paid by carriers to the car owner.

(c) What relation investment in private cars, cost of operation, maintenance and depreciation, and loaded and empty per car-mile freight earnings, should bear to the rental to be paid by the carrier.

(d) Whether charges for refrigeration should be a stated sum for the service, in cents per 100 lb. of freight hauled, or be based on the cost of service.

(e) Rules and practices respecting icing and re-icing.

(f) Rules and practices of defendants as to mixtures, minimum weights and charges, part-lot shipments, return of empty containers, etc.

(g) Demurrage charges on private cars.

(h) Whether the M. C. B. rules with respect to private cars should be filed with the commission.

The case is set for hearing before Examiner George N. Brown at the Sherman Hotel, Chicago, February 4.

STATE COMMISSIONS

The Public Utilities Commission of Colorado, in view of the added demands which the war has made upon the railroads, has reduced its annual report requirements for the calendar year 1917 and now orders that carriers may discontinue the rendering of monthly passenger train movement reports. The last report to be filed will be that for the month of December.

The Public Utilities Commission of Colorado, reporting a case which was decided October 27, announces that it has permitted the Crystal River & San Juan Railroad to discontinue operation of trains on its line, seven miles long, until April 1 next. This road, about 30 miles south of Glenwood Springs, served the

Colorado Yule Marble Company; that company has apparently failed and a large portion of the population has moved away. The order of the commission forbids the railroad company to carry off its railroad, or any part thereof.

COURT NEWS

Consignee's Liability for Freight Charges

The Pennsylvania Superior Court holds that a consignee of lumber who refuses to accept delivery because the lumber was not of the kind he ordered will not be relieved from the transportation charges. He must look to the consignor to recover for any loss sustained because of any defect in the goods consigned.—*P. & R. v. Parry*, 66 Pa. Superior Ct. 49. Decided March 13, 1917.

Contributory Negligence of Trackman

A trackman, after seeing an express approaching at 50 or 60 miles an hour, decided he could strike a few more licks at his work and then avoid injury, and attempted to do so. He was struck by the pilot beam of the locomotive and killed. The Arkansas Supreme Court holds that he was guilty of contributory negligence as matter of law, barring recovery for his death.—*Tyler v. St. Louis, I. M. & S. (Ark.)*, 198 S. W., 128. Decided October 29, 1917.

Remedy for Refusal of Through Bill-of-Lading

The Circuit Court of Appeals, Eighth Circuit, holds that a bill to compel a railroad company to issue a bill of lading requiring it to carry and deliver at a place on the line of another road a single carload of wheat owned by the complainant, does not state a cause of action within the jurisdiction of a federal court of equity, there being an adequate remedy at law by an action for damages, which were easily ascertainable.—*Northern Pacific v. V. D. Harrington Co.*, 245 Fed., 454. Decided July 2, 1917.

Crossing Accidents—Contributory Negligence

The Oregon Supreme Court holds that safety to the public and travelers on trains requires that a person driving an automobile over a crossing should look carefully upon the track itself where a train may be expected, if there be opportunity so to inspect the situation; and the motorist who neglects this duty is negligent as a matter of law. The driver of a motor truck approaching a crossing, whose hearing was interfered with by the ringing of the bell on a standing locomotive, went forward experimentally and collided with a switch engine on the next track. It was held that he was negligent and judgment for the plaintiff was reversed and the cause remanded with directions to enter judgment of nonsuit for the defendant.—*Cathcart v. Oregon-Washington R. & Nav. Co. (Ore.)*, 168 Pac., 308. Decided November 6, 1917.

Prohibitive Rates Not Necessarily Unlawful

The Pennsylvania Superior Court holds that the fact that a rate is prohibitive does not make it *per se* unlawful. There are many elements which may enter into the fixing of a rate, such as the factor of distance, ton-mile revenue, car-mile revenue, earnings per car, and a comparison of the rates on other commodities of equal or higher value, the volume of movement, the value of the service to the shipper or consignee, and the cost of service. When all or some of these matters, and possibly others, are taken into consideration it does not follow that they will always result in the fixing of rates that will make it profitable for every shipper to use the means of transportation. His need may be a factor to be considered, but it is not a determining one. The fact that traffic does not move is not conclusive that the rates are not reasonable.

It was also held, on appeal from an order of the Pennsylvania Public Service Commission adopting the rates suggested by the complainant, a shipper of building sand, in a proceeding against a railroad company, that it was not proper for the commission to fix a rate for a route of a mileage of thirteen miles on a basis of what the rate should be on a route of 7.6 miles, when it did not appear that the shorter route was available, or that the carrier whose road comprised part of the shorter route was

a party to the proceedings.—*McCrary Bros. Co. v. P. & L. E., 66 Pa. Superior Ct., 307. Decided March 16, 1917.*

Provision in Bill of Lading as to Measure of Damages

The Kansas Supreme Court holds that a provision in a bill of lading that the amount of any loss or damage for which the carrier was liable shall be computed on the basis of the value of the property (being the bona fide invoice price, if any, to the consignee, including the freight charges, if prepaid) at the place and time of shipment, is reasonable and valid, and intended merely to establish a rule for determining the value of the property in case of loss, and not to limit or diminish the carrier's liability. In an action for damages for failure to deliver a shipment of wheat it was held that such a provision in the bill of lading precluded the recovery of the shipper for the difference between the market value of wheat at the place of delivery and the contract price at which the shipper had sold it after the original purchaser had declined to receive it. The measure of damages was held to be the difference between the price which the wheat sold for at the place where it was delivered and the invoice price or fair market value at the point and time of shipment.—*Wallingford v. Atchison, T. & S. F. (Kan.), 167 Pac., 1136. Decided October 6, 1917.*

Employees' Authority to Hire Physician

In an action by a physician against a railroad for services rendered to an employee of the defendant, who had been severely injured, but not in the course of his employment, having lain off for the day from his duties on grading work, it appeared that the plaintiff had been employed by an assistant engineer of the defendant. The Iowa Supreme Court holds that an assistant engineer, in charge of grades and bridges, with power to hire and discharge men, and hire physicians, in the absence of company physicians, to care for injuries, has no implied authority to employ a physician to treat or operate on an employee injured while not engaged in the line of his duty or service and within the scope of his employment. The duties of an assistant ordinarily are circumscribed, and the circumstance of being "assistant" puts all on inquiry as to the scope of his activity in helping another or others. It has been held that authority to employ a physician is not to be inferred from the mere fact that an employee is roadmaster, or a conductor, or a foreman, or a yardmaster, or a general surgeon.—*Carson v. Chicago, M. & St. P. (Iowa), 164 N. W., 747. Decided October 20, 1917.*

Assault and Robbery in Crowded Car

The North Carolina Supreme Court holds that a railroad is not liable to a passenger assaulted and robbed on its train, although the cars were without light and badly overcrowded, where there was no causal connection between the road's supposed negligent act in overcrowding and failing to light its cars and the injury caused to have resulted therefrom. The court quoted Lord Selborne, then Lord Chancellor (1894) in the English case of *Cobb v. Railroad Co.*, App. Cases 424, an action to recover damages from a railroad company for a sum of money which the plaintiff alleged had been taken from his person by robbery as a consequence of the company's negligence in allowing the carriage to be overcrowded, as follows: "I do not think it necessary to say more than that, on the plaintiff's pleading, it is not shown that the overcrowding of the carriage did in fact conduce in any way directly or indirectly to the robbery; and on the assumption that, under some possible circumstances, this might have been actionable negligence, it would, in my judgment, be indispensable, for that purpose, to state and prove some actual connection between the overcrowding and the loss. It is not, in my opinion, enough to suggest (as the plaintiff does) that to suffer such overcrowding was to 'facilitate the hustling and robbing of the plaintiff.' As the case is stated by him, nothing turns upon the fact that the robbery was committed by a gang of more than nine persons." In the present case the court said that the assault was not described with any particularity so that the court could understand how it came about, and seemed to be only the pleader's conclusion as to its character and not a statement of the facts. For this reason it held the case should have been dismissed, and reversed a judgment for the plaintiff.—*Chancey v. Norfolk & Western (N. Car.), 93 S. E., 834. Decided October 17, 1917.*

Equipment and Supplies

FREIGHT CARS

THE LESH OIL COMPANY, Kansas City, Kan. is inquiring for 10 8,000-gal. capacity tank cars.

THE PRODUCERS AND REFINERS CORPORATION Tulsa, Okla., is inquiring for 20 8,000-gal. capacity tank cars.

THE PRUDENTIAL OIL CORPORATION has ordered 50 tank cars from the Standard Car Construction Company.

THE GREAT WESTERN CONTRACTING COMPANY has issued inquiries for 30 8,000 and 10,000-gal. tank cars.

THE PENNSYLVANIA SALT MANUFACTURING COMPANY Philadelphia, has issued an inquiry for 5 acid tank cars.

THE MIDLAND REFINING COMPANY, Eldorado, Kan., is inquiring for 15 to 40 8,000-gal. to 10,000-gal. capacity tank cars.

THE OIL, GAS & LEASE COMPANY, Ardmore, Okla., is inquiring for 20 8,000-gal. and 10 10,000-gal. capacity tank cars.

THE EASTERN REFINING COMPANY, Oil City, Pa., has ordered 20 8,050-gal. capacity tank cars from the Pennsylvania Tank Car Company.

SIGNALING

THE PIEDMONT & NORTHERN has ordered from the Union Switch & Signal Company the materials for two small temporary interlockings at the entrances to the national cantonment at Camp Greene, Charlotte, N. C. Each plant includes a three-lever dwarf machine, and the signal indications will be controlled primarily by knife switches and selected over circuit controllers on the levers of the machine.

THE ATCHISON, TOPEKA & SANTA FE has ordered from the Union Switch & Signal Company the signals to be used on the Richmond-Fresno, Cal. section; 50 style "S," three-position, low voltage, D. C. double case ground signals, and 50 single case bridge signals of the same type. The Union company has also received a contract to furnish 49 style "S" ground signals for the Goffs-Bagdad division of the Santa Fe.

THE PENNSYLVANIA is to install three electro-pneumatic push-button machines at Hackensack Meadows, between Jersey City, N. J., and Newark; at "MV" cabin a 48-unit machine for the western receiving yard; at "CA" cabin, a 36-unit machine; and at "MW" cabin, located at the eastern limits of Hackensack Meadows, a 12-unit machine. All of these yards are laid out on a new fill, built over the old freight and passenger main tracks. There will be humps with an elevation of 21 ft. and a 4 per cent grade. Direct current for the detector locking will be supplied by the Edison storage batteries, charged in series-discharged in multiple duplicate motor generator sets being used for charging. The installation will be made by the railroad's own forces, with the materials to be supplied by the Union Switch & Signal Company.

THE BOSTON & MAINE has ordered from the Union Switch & Signal Company the materials for an electro-pneumatic interlocking at Tower "C," East Somerville, Mass., a 71-lever frame with 66 working levers and a total of 147 operation units. The new plant will extend the electro-pneumatic system now in service, viz.: North Station (A), 123 working levers, and Tower B, 69 working levers, there being one block between Tower B and C. Speed signaling has been adopted for this interlocking, and provision is also made to reverse traffic on the four main line tracks between Towers B and C. The plant also comprises a single-track crossing of the four tracks of the Boston & Maine by the Grand Junction line of the Boston & Albany. Alternating current track circuits will be used throughout, with electric section and section route locking. The electro-pneumatic high signals are semi-automatic with section control and lower arms.

Supply Trade News

J. H. Sharp has been appointed western representative of the Glazier Manufacturing Company, with headquarters at the McCormick building, Chicago.

F. H. Bird, traveling engineer of the American Steel Foundries, Chicago, has received a commission as first lieutenant in the ordnance department of the United States army and is now stationed at Dayton, Ohio.

N. M. Stineman, until recently chief engineer of the LaSalle Engineering Company, Chicago, and formerly office engineer of the Chicago, Milwaukee & St. Paul, Chicago, has been commissioned a captain in the engineering corps of the United States army.

Oscar F. Ostby, 2736 Grand Central Terminal, New York, has been appointed sales representative for the White American Locomotive Sander Company, Roanoke, Va., for territory from Baltimore north to the Canadian border and west as far as Pittsburgh and Cleveland.

Effective January 1, Mr. J. E. Buckingham, at present Northwestern representative of the Standard Steel Works Company with offices in the Northwest Bank building, Portland, Oregon, will become assistant general manager of the Hofius Steel & Equipment Company, Seattle.

A BACTERIOLOGICAL MOTOR CAR.—It is stated in the Indian and Eastern Engineer that a bacteriological car laboratory has been presented to the French Army. This remarkable motor car—the first of its kind—carries a complete bacteriological laboratory, 18 ft. by 12 ft., which can be erected in the space of an hour and a half. The laboratory is fitted with bacteriological incubators, microscopes and autoclave and all other accessories. These parts are fitted into specially designed cantens, so that nothing can be smashed, and everything is ready for use instantly and in the order required. The car and the portable laboratory are fitted with electricity and water is laid on.

CONSTRUCTION WORK IN MALAY STATES.—The linking up of the Siamese Southern Railway with that of the British Federated Malay States has finally been accomplished, railway officers of both systems having recently traversed the new road connecting Bangkok with Singapore. However, the track on either side is not yet completed, a number of bridges and other masonry work remaining to be done, and owing to the difficulty of obtaining ironwork from abroad, the line may not be ready for passenger traffic until April of next year. The completion of the northern line has also been hindered because of delay in obtaining rails and other construction material. A proposal is therefore under consideration to complete the railway only as far as Pang Choompo, and from this place to build a road suitable for motor traffic to Chiengmai.—*Commerce Report.*

AUTOMATIC SIGNALS FAVORED IN AUSTRALIA.—Automatic block signaling is approved on the New South Wales Government Railways, and is being introduced under two distinct conditions. On suburban lines it is used in order to shorten the headway between trains, and thus increase the traffic capacity. On country lines in districts that are thinly settled but have considerable through traffic it is found that automatic signals between stations afford improved facilities for dealing with through trains without requiring an increased force. The cost of installation and maintenance is greater than with manual signals, but there is a net saving in cost and an increase in safety due to the elimination of manual operation. Thus the 108 block sections equipped in 1916 would have required 46 signal towers, with a staff of 138 men whose wages would amount to not less than \$120,000 per year. A cab-signal and train-control system is being tried experimentally on the Richmond Branch. An audible signal is given in the cab and must be acknowledged by the engineman. If he fails to stop within a given distance after receiving a "stop" signal, a partial application of the brakes is made automatically.—*Engineering News-Record.*

Railway Financial News

BALTIMORE & OHIO.—Negotiations are being conducted by this company for the purchase of the Little Kanawha Railroad, which extends from Parkersburg, W. Va., to Owensport, a distance of 29 miles.

DELAWARE & HUDSON.—At a meeting of the directors on December 26, a quarterly dividend of $\frac{3}{4}$ per cent was declared, an official announcement being issued as follows:

The practice of the Delaware & Hudson Company for recent years has differed from that of other railway corporations in that it has been customary to take final action upon the dividend for the ensuing calendar year during December.

For ten years the board of managers has in each December declared a dividend of 9 per cent, payable during the next year in four quarterly installments of $\frac{3}{4}$ per cent, all such payments to be made out of surplus accumulative prior to the meeting at which the dividend action was taken.

The accumulative surplus of the present time as well as the earnings of the calendar year, 1917, now available for dividends, would fully warrant the declaration of a 9 per cent dividend payable in the same manner during 1918.

The board of managers feel that the present time is one of great uncertainty as to all the elements which will determine cash resources and cash requirements during the ensuing year. Under these conditions it is plain, without anticipating any future action, that it would be wise not to commit the company irrevocably to large cash disbursements, to be made so far in the future, but rather to follow the general practice of making dividend declaration quarterly.

GULF, MOBILE & NORTHERN.—Negotiations have been completed by this company for purchase and control of the Meridian & Memphis Railway, which extends from Meridian, Miss., to Union, a distance of 33 miles. Formal transfer will take place as soon as the debts of the Meridian & Memphis are liquidated.

LITTLE KANAWHA.—See Baltimore & Ohio.

MARSHALL & EAST TEXAS.—Hearings on the petition of the St. Louis Trust Company for court permission to sell this road as junk, have been postponed until January 14, 1918.

MERIDIAN & MEMPHIS.—See Gulf, Mobile & Northern.

MOHAWK RAILROAD.—This company's line from Calumet, Mich., to Gay, which has been operated by the Mineral Range, was taken over by the Copper Range, effective December 15. Passenger service on the Copper Range between Houghton and Gay was established on December 17.

PENNSYLVANIA COMPANY.—This company, which operates the Pennsylvania Lines West of Pittsburgh, has declared a dividend of 3 per cent. The dividend is payable December 31 to stock of record December 25. All the stock is owned by the Pennsylvania Railroad. This makes 6 per cent declared this year, 3 per cent having been paid six months ago. In 1916, a total of 8 per cent was declared, and in 1915, 6 per cent.

PENNSYLVANIA RAILROAD.—Comparing the number of this company's stockholders, on November 1, with a year ago, there was an increase of 7,174 to a total of 96,995. The average holdings were 102.95 shares, an increase of 8.22 per cent. The number of foreign holders was 1,857, a decrease of 1,633; and they held 2.13 per cent of the total 9,985,314 shares outstanding, a decrease of 1.58 per cent. The average holding abroad was 114 shares, an increase of 8.

In Pennsylvania there were 41,856 holders, an increase of 5,707, representing 33.81 per cent of the total stock outstanding; in New York, 17,723 holders, an increase of 858, representing 36.04 per cent of the total stock. Women stockholders numbered 48,327, or nearly half the stockholders, an increase of 3,791, and holding 28.49 per cent of the total share capital.

THE EXPORTS FROM GREAT BRITAIN of railway cars for the first nine months of 1917 were valued at \$1,606,003 as compared with \$2,535,402 for the corresponding period of 1916.

Railway Officers

Executive, Financial, Legal and Accounting

P. L. McManus has been appointed assistant to the president of the Coal & Coke Railway, with office at Elkins, W. Va.

V. J. Bradley, general supervisor of mail traffic of the Pennsylvania Railroad system, with office at Philadelphia, Pa., has been appointed vice-president's assistant in general charge of the mail traffic of the Pennsylvania Railroad, and the relations of the railroad with the government, in connection with the transportation of the United States mails.

C. M. Ball, whose appointment as assistant to the vice-president and general manager of the Oregon Short Line and assistant to the first vice-president of the Los Angeles & Salt Lake, with headquarters at Salt Lake City, Utah, was announced in these columns on December 14, was born at Osceola, Iowa. He entered the service of the Oregon Short Line in 1898 in a local freight office. In 1900 he resigned to engage in other business but returned to the road in 1902. In 1903 he was transferred to the superintendent's office as time keeper where he remained until 1905 when he resigned and entered the service of the Southern Pacific at Los Angeles, Cal., as chief clerk in the local freight office. In 1908 he was promoted to assistant chief clerk to the general superintendent where he remained until 1915 when he was again promoted to chief clerk to the assistant general manager which position he held until his appointment as mentioned above.

Operating

Maurice Daily has been appointed general superintendent of the Missouri, Oklahoma & Gulf, with headquarters at Muskogee, Okla., succeeding W. G. Humphrey.

E. C. Wills, superintendent of the Missouri Pacific at Wichita, Kan., has been appointed assistant general manager, with office at St. Louis, Mo., effective December 19.

A. S. Johnson, superintendent of the Terminal Railroad Association of St. Louis, who has been promoted to assistant general manager, a newly created position, with headquarters at St. Louis, Mo., as has already been announced in these columns, was born at Seymour, Ind., on July 21, 1871. He first entered railway service with the Terminal Railroad Association of St. Louis on November 8, 1889, and has been with that company ever since. He was appointed freight agent on October 13, 1903, and superintendent with headquarters at St. Louis on April 23, 1913. He was promoted to assistant general manager, with headquarters at St. Louis on December 13, 1917.

A. S. Johnson

J. H. Fraser, former general manager of the Detroit, Toledo & Ironton of Detroit, Mich., has been appointed general manager of the Gulf, Florida & Alabama, with headquarters at Pensacola, Fla.

F. M. Doar, superintendent of transportation of the Charleston & Western Carolina, with office at Augusta, Ga., has been appointed general superintendent, and the office of superintendent of transportation has been abolished.

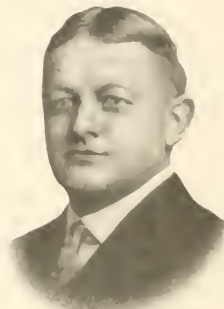
G. L. Hickey, assistant to the vice-president and general manager of the Oregon Short Line, has been promoted to superintendent of transportation for the Union Pacific system, with head-

quarters at Omaha, succeeding L. C. Marston, resigned. Mr. Hickey was succeeded by C. M. Ball, mentioned in these columns on December 14.

E. A. O'Donnell, assistant superintendent of the Southern Pacific Texas Lines, with office at El Paso, Tex., has been appointed superintendent Houston terminals, vice T. C. Worthington, resigned to accept service with another company.

W. H. Carter, trainmaster of the Cincinnati division of the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Springfield, O., has been appointed assistant superintendent, with office at the same point, E. M. Kelly, trainmaster of the Sandusky division, with headquarters at Bellefontaine, O., has been transferred to the Cincinnati division, succeeding Mr. Carter; J. J. Schreck, trainmaster at Wabash, Ind., was appointed trainmaster of the Sandusky division, succeeding Mr. Kelly, and O. P. Whitlock was appointed assistant trainmaster of the Cincinnati division, succeeding H. E. Perry, who resigned to enlist in the army effective December 1.

Edward Henry Harman, who has been appointed superintendent of the Wiggins Ferry Company, the St. Louis Transfer Railway and the East St. Louis Connecting Railway, with head-



E. H. Harman

quarters at St. Louis, Mo., as has already been announced in these columns, was born at Vernon, Mo., on August 25, 1876. He first entered railway service with the Vandalia in March, 1894. For two years he was employed in clerical capacities in the mechanical, operating and engineering departments at St. Louis, Mo., and Terre Haute, Ind., following which he was employed for two years in the mechanical department of the Terminal Railroad Association of St. Louis, at St. Louis. He then returned to the Vandalia at Terre Haute, where he was clerk and later chief clerk to the division freight agent. Two years later he went to Houston, Tex., to become private secretary to the chief engineer of the Southern Pacific Lines. He returned to the Terminal Railroad Association about 1901 and has been with that road ever since in the offices of the master mechanic, general superintendent and superintendent. For the past 10 years he has been chief clerk to the superintendent. Mr. Harman has been prominently identified with the American Association of Railroad Superintendents for a number of years, more recently as secretary. During which time membership increased from 75 to approximately 800. On his appointment as superintendent at St. Louis he was elected secretary of that association.

Leonard F. Johnston, whose appointment as superintendent of the Prairie du Chien and Mineral Point divisions of the Chicago, Milwaukee & St. Paul with headquarters at Milwaukee, Wis., was announced in these columns November 23, was born at Dakota, Minn., on November 29, 1878. He entered the service of the Chicago, Milwaukee & St. Paul on October 31, 1904, and has been in the employ of that company continuously from that date, serving as telegraph operator until July, 1909, when he was promoted to train despatcher. On March 20, 1907, he was again promoted to chief despatcher, which position he held until August 26, 1912, on which date he was promoted to train master. He remained in that capacity until November 5, 1917, on which date his appointment as mentioned above became effective.

W. M. Weidenhimer, whose appointment as inspector of transportation of the Chicago, Milwaukee & St. Paul was announced in these columns December 14, was born in Schuyler county, Ill., on June 23, 1863. He entered the service of the Chicago, Burlington & Quincy on January 2, 1880, as a brakeman and was promoted to conductor on February 12, 1885. On May 4, 1904, he

was assigned to special duties by the operating vice-president. He was appointed trainmaster of the Galesburg division, with headquarters at Galesburg, Ill., on November 1, 1904, and on October 15, 1905, he was transferred in the same capacity to the McCook division with headquarters at McCook, Neb. He was promoted to superintendent of the Sterling division on December 15, 1908, with headquarters at Sterling, Colo., and on December 1, 1909, was transferred in the same capacity to the Alliance division with headquarters at Alliance, Neb., which position he held until December 1, when he resigned to accept service with the St. Paul, as noted above.

M. B. Lamb, whose appointment as superintendent of the Chicago, Burlington & Quincy at Hannibal, Mo., was announced in these columns on December 7, was born in Hannibal on November 12, 1872. He entered the service of the Burlington on September 1, 1886, as a caller at Burlington, Ia. From October 1, 1889, to March 1, 1894, he was telegraph operator on the Ottumwa division; from March 1, 1894, to May 1, 1895, telegraph operator at Hannibal, Mo.; from May 1, 1895, to December 30, 1899, telegraph operator, bill clerk and chief clerk, freight department, Keokuk, Iowa; from December 30, 1899, to May 12, 1903, wire chief, car distributor and despatcher at Hannibal, Mo.; May 12, 1903, to February 15, 1907, despatcher at Brookfield, Mo.; from February 15, 1907, to January 1, 1911, night chief despatcher at Brookfield, Mo.; from January 1, 1911, to June 12, 1912, terminal trainmaster at Beardstown, Ill.; and from January 12, 1912, to June 20, 1917, trainmaster of the Beardstown division. On June 20, 1917, he was promoted to assistant superintendent of the La Crosse division, with headquarters at St. Paul, Minn., which position he held at the time of his appointment as superintendent of the Hannibal division, effective December 1.

Traffic

G. A. Blair, assistant freight traffic manager of the Chicago, Milwaukee & St. Paul at Chicago, has resigned, effective December 31.

C. H. Guion has been appointed commercial agent of the Missouri, Kansas & Texas at Galveston, Tex., succeeding C. P. Norman, acting commercial agent, transferred, effective December 1.

Engineering and Rolling Stock

J. A. Heaman, whose appointment as assistant chief engineer of the Grand Trunk Pacific, with headquarters at Winnipeg, Man., was announced in these columns on November 16, was born at Memphis, Tenn., on June 3, 1874. He attended the public schools and Collegiate Institute at London, Ont., and graduated from McGill University at Montreal, Que., in 1902. He was also an articled pupil to Moore & Henry, engineers and surveyors at London, Ont., from 1893 to 1898 and holds a diploma for the Ontario and Dominion Land Surveyors. He entered railway service as an instrument man on the Grand Trunk at St. Catharines and Port Union, Ont., in April, 1901. He was resident engineer at Oshawa, Ont., from April, 1902,



J. A. Heaman

to November, 1902; from November, 1902, to November, 1903, he was assistant resident engineer at Toronto, Ont. He entered the service of the Grand Trunk Pacific as an assistant engineer in charge of a location party east of Winnipeg in November, 1903. From May, 1905, to November, 1906, he was division engineer in charge of location and construction east of Winnipeg, and from November, 1906, to October, 1908, he was assistant district engineer at Kenora, Ont. From October, 1908, to June, 1910, he was assistant district engineer of the Grand Trunk Pacific at Kenora

and Winnipeg, and in April, 1911, was promoted to district engineer with office at Winnipeg, in which position he remained until March, 1912, when he was appointed office engineer at Winnipeg. From March, 1912, until August, he was division engineer at Jasper, Alta. On the latter date he was promoted to assistant to the chief engineer at Winnipeg, which position he held at the time of his appointment as mentioned above, effective November 1.

Edward S. Pearce, whose appointment as mechanical engineer of the Cleveland, Cincinnati, Chicago & St. Louis, with office at Beech Grove, Ind., was announced in the issue of December 7, graduated from the mechanical engineering course at Purdue University and was first employed in the maintenance of way and mechanical departments of the Norfolk & Western. From June, 1913, to January, 1914, he was employed in the machinery department of Jos. T. Ryerson & Sons, Chicago. On the latter date he entered the service of the New York Central Lines West as a special engineer in the office of the chief mechanical engineer at Chicago, where he remained until June, 1914, when he was transferred in the same capacity to the office of the superintendent of motive power of the Cleveland, Cincinnati, Chicago & St. Louis. In April, 1916, he was promoted to assistant mechanical engineer and in January, 1917, he was again promoted to special engineer in the office of the general superintendent, transportation department which position he held at the time of his appointment, as noted above, effective December 1.

H. R. Warnock, whose appointment as general superintendent of motive power of the Chicago, Milwaukee & St. Paul, was mentioned in these columns December 14, was born at Newcastle, Pa., on July 16, 1870. He began railway work as a freight brakeman with the Pennsylvania Lines West of Pittsburgh in June, 1889, and later in the same year went to the Pittsburgh & Lake Erie as a brakeman. In September, 1891, he was promoted to locomotive fireman and later was locomotive engineer, which position he held until May, 1900. From that date until July, 1904, he served consecutively as engine despatcher, roundhouse foreman, and general foreman, resigning on the latter date to become master mechanic of the West Side Belt, Pittsburgh, Pa., where he remained until October, 1905, when he became master mechanic of the Monongahela Railroad. He remained in this position until September, 1913, when he was appointed superintendent of motive power of the Western Maryland, which position he held until his appointment as noted above, effective December 15. As general superintendent of motive power of the St. Paul, he will have headquarters at Chicago.



H. R. Warnock

Railway Officers in Military Service

F. G. Robbins, general superintendent of the Erie at Chicago, has been commissioned a major in the Engineers Officers' Reserve Corps.

J. R. Jackson, assistant engineer of tests of the Atchison, Topeka & Santa Fe, Chicago, has received a commission as captain in the ordnance department of the United States army.

C. W. Haupt, assistant engineer in the valuation department of the Illinois Central, Chicago, has received a commission as second lieutenant in the engineering corps of the United States army.

SOUTH AFRICAN TRAFFIC RESTRICTED.—A cable to the African World states that in consequence of a shortage of locomotive power on the South African railways, coupled with the movement of maize coastwards, the coal and passenger traffic is restricted.

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